

Program Specification

For

Zoology/Chemistry Program

B. Sc. Program

Faculty of Science, Fayoum University

Quality Assurance Unit (QAU)

2016

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

"فَأَمَّا الزُّبْدُ فَيَذْهَبُ جُفَاءً وَأَمَّا مَا يَنْفَعُ النَّاسَ فَيَمْكُثُ فِي الْأَرْضِ"

صدق الله العظيم
سورة الرعد - آية 17



FIRST LEVEL

FIRST SEMESTER



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Faculty of Science



Course Specification For **Introductory Zoology (I)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z111	Title	Introductory Zoology (I)			Level	1	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The physiology is the main branch of life science , which deals with the study of various body systems in terms of structure , function and chemistry .

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Describe normal cell and structural of various cells
	a2	recognize and describe the composition and structure of different human systems .
	a3	describe the functions of digestive , cardiovascular excretory .nervous , muscular and endocrine systems
	a4	explain the regulation of various processes of life .
b- Intellectual skills: At the end of the course the student should be able to:	b1	Interpret the structure and function of principle body systems of animals
	b2	Develop laboratory skills necessary for biological study
	b3	Analyze the relation ship between the structure and the functions of body systems .
	b4	Answer MCQ questions on studied parts of the curriculum



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Know the structure of the excretory system and the steps of urine formation and its hormonal controlling (Know the structure of the circulatory system and its function)	
	c2	dissect the frog and identify different system (describe different organs in the frog.).	
	c3	make Know how to label diagrams of different levels in the cell structure (experiments about digestion of carbohydrates, fats and proteins)	
	c4	Know the nutrition and the healthy food for normal lifestructure of digestive system and metabolism of different food.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	The ability to manage learning and making use of scholarly review	
	d2	An ability to communicate information effectively to special and non-specialist audiences	
	d3	An ability to undertaken appropriate further professional training.	
4-Contents	1	Introduction to human physiology	
	2	Digestive system	
	3	Circulatory system	
	4	Respiratory system	
	5	Excretory system	
	6	Nervous system	
	7	Muscular system	
	8	Endocrinal system	
	9	Practical part	
5- Teaching and learning method	1	lecture	✓
	2	Discussion	✓
	3	Practical	✓
	4	Homework	✓



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-Term Examination	8	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Text – Book of Animal Biology ,Vol. ,11 Practical of Animal - Biology		
c-Suggested Books				
d-Scientific periodicals or Publications	1	Foundations of anatomy and physiology		
	2	Recommended books		
	3	Periodical, websites etc		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to human	1	a1 ,			



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	physiology					
2	Digestive system	2-4	a2 , a3 ,	b1 , b3 ,	c3 , c4 ,	d1 ,
3	Circulatory system	5-7	a2 , a3 ,	b1 , b3 ,	c1 , c1 ,	d1 , d2 ,
4	Respiratory system	8	a2 , a3 ,	b1 , b3 , b4 ,		
5	Excretory system	9	a2 , a3 ,	b1 , b3 , b4 ,	c1 ,	
6	Nervous system	10,11	a2 , a3 , a4 ,	b1 , b3 , b4 ,		d1 , d3 ,
7	Muscular system	12	a2 , a3 ,	b1 , b3 , b4 ,		d3 ,
8	Endocrinal system	13,14	a2 , a3 , a4 ,	b1 , b3 , b4 ,		d2 ,
9	Practical part	on all weeks		b2 ,	c2 ,	

Course Coordinator Prof. Dr. **Samira Mohamoud El sayad**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For

Invertebrate (1)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z132	Title	Invertebrate (1)			Level	1	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course allows students to develop specialized knowledge and skills in the major phyla of unicellular (protozoa) and unicellular (metazoan) organisms. We will explore classification, body construction and biological activity of selected species. The student will explore the life cycle of some human and animal parasites to understand the mechanism of infection

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	enumerate oneself with the common taxa of protozoa and metozoa
	a2	describe the relationship between the form and function for the protozoa
	a3	give an account the major groups of unicellular and multicellular organisms
	a4	summarize how animals are classified into major taxa
	a5	enumerate selected animals from one another based upon relevant morphological features



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>conclude the various stages of he cycle of some human and animal parasites.</td></tr> <tr> <td>b2</td><td>give an account of human parasitic diseases</td></tr> <tr> <td>b3</td><td>describe protozoan, platyhelminth and nematode parasites</td></tr> <tr> <td>b4</td><td>Collect and preserve invertebrate sample for analysis</td></tr> </table>	b1	conclude the various stages of he cycle of some human and animal parasites.	b2	give an account of human parasitic diseases	b3	describe protozoan, platyhelminth and nematode parasites	b4	Collect and preserve invertebrate sample for analysis				
b1	conclude the various stages of he cycle of some human and animal parasites.												
b2	give an account of human parasitic diseases												
b3	describe protozoan, platyhelminth and nematode parasites												
b4	Collect and preserve invertebrate sample for analysis												
c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>Use microscopes and dissect small organisms</td></tr> <tr> <td>c2</td><td>Learn the biological vocabulary linked to this particular field of biology.</td></tr> <tr> <td>c3</td><td>Collect information from its relevant sources and use it in discussion or making laboratory report</td></tr> <tr> <td>c4</td><td>design selected animals from one anther based upon relevant morphological features</td></tr> <tr> <td>c5</td><td>Handle human parasitic diseases</td></tr> </table>	c1	Use microscopes and dissect small organisms	c2	Learn the biological vocabulary linked to this particular field of biology.	c3	Collect information from its relevant sources and use it in discussion or making laboratory report	c4	design selected animals from one anther based upon relevant morphological features	c5	Handle human parasitic diseases		
c1	Use microscopes and dissect small organisms												
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c3	Collect information from its relevant sources and use it in discussion or making laboratory report												
c4	design selected animals from one anther based upon relevant morphological features												
c5	Handle human parasitic diseases												
d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Identify the various stages of he cycle of some human and animal parasites</td></tr> <tr> <td>d2</td><td>Understand the major groups of unicellular and multicellular organisms</td></tr> <tr> <td>d3</td><td>Collect information from its relevant sources and use it in discussion or making laboratory report.</td></tr> <tr> <td>d4</td><td>Learn the biological vocabulary linked to this particular field of biology.</td></tr> <tr> <td>d5</td><td>Collect information from its relevant sources and use it in discussion or making laboratory report</td></tr> </table>	d1	Identify the various stages of he cycle of some human and animal parasites	d2	Understand the major groups of unicellular and multicellular organisms	d3	Collect information from its relevant sources and use it in discussion or making laboratory report.	d4	Learn the biological vocabulary linked to this particular field of biology.	d5	Collect information from its relevant sources and use it in discussion or making laboratory report		
d1	Identify the various stages of he cycle of some human and animal parasites												
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4-Contents	<table border="1"> <tr> <td>1</td><td>The bases of invertebrate classification .</td></tr> <tr> <td>2</td><td>General characters,cellular organization and classification of different protozoa and examples from each class</td></tr> <tr> <td>3</td><td>General characters, types of sponge construction, reproduction and classification.</td></tr> <tr> <td>4</td><td>General characters of cnideria and other clas, nematocysts, body wall and cellular structure , nutrition and nervous system.</td></tr> <tr> <td>5</td><td>General characters and classificationof Trematoda : a- Hepatic flukes e.g Fasciola sp. b- Blood fluckes e.g Schistosoma sp. c- Intestinal flukes e.g Heterophyess</td></tr> <tr> <td>6</td><td>Class: Cestoda (Taenia saginata and T. solium)</td></tr> </table>	1	The bases of invertebrate classification .	2	General characters,cellular organization and classification of different protozoa and examples from each class	3	General characters, types of sponge construction, reproduction and classification.	4	General characters of cnideria and other clas, nematocysts, body wall and cellular structure , nutrition and nervous system.	5	General characters and classificationof Trematoda : a- Hepatic flukes e.g Fasciola sp. b- Blood fluckes e.g Schistosoma sp. c- Intestinal flukes e.g Heterophyess	6	Class: Cestoda (Taenia saginata and T. solium)
1	The bases of invertebrate classification .												
2	General characters,cellular organization and classification of different protozoa and examples from each class												
3	General characters, types of sponge construction, reproduction and classification.												
4	General characters of cnideria and other clas, nematocysts, body wall and cellular structure , nutrition and nervous system.												
5	General characters and classificationof Trematoda : a- Hepatic flukes e.g Fasciola sp. b- Blood fluckes e.g Schistosoma sp. c- Intestinal flukes e.g Heterophyess												
6	Class: Cestoda (Taenia saginata and T. solium)												



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	7	Nematoda (Ascaris sp., Ancylostoma sp. And Enterobius sp. -General characters and classification Annelida. Aereis sp ., Aporrectodea)		
5- Teaching and learning method	1	lecture		✓
	2	Discussion		✓
	3	Practical		✓
	4	Homework		✓
6- Teaching and learning methods for students with limited capacity				Not Availiable.
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-Term Examination	55	73.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	Course notes: and a laboratory guide will be provided		
b-Essential Books(text books)	1	Pechenik ,J.A. (1996) Biology of the invertebrates.third year edition WCB. Publishers		
c-Suggested Books	1	Hickman, C.P. Jr; Robert, L.S.; Larson, A.;I Anson,H.; Eisenhour, D.J (2006) Integrated principle of zoology 13 year edition . The Mc Graw- Hill companies : Boston .		



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d-Scientific periodicals or Publications	1	www.sciencedirect.com
	2	www.Wikipedia www.Wikipedia
	3	www.ucmp.berkeley.edu/help/taxaform.htm/ www.ucmp.berkeley.edu/help/taxaform.htm/
	4	www.mbl.edu
	5	www.Mhhe.com/zoology

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	The bases of invertebrate classification .					
2	General characters,cellular organization and classification of different protozoa and examples from each class					
3	General characters, types of sponge construction, reproduction and classification.					
4	General characters of cnideria and other clas, nematocysts, body wall and cellular structure , nutrition and nervous system.					
5	General characters and classificationof Trematoda : a- Hepatic flukes e.g Fasciola sp. b- Blood fluckes e.g Schistosoma sp. c- Intestinal flukes e.g Heterophyess					



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6	Class: Cestoda (Taenia saginata and T. solium)					
7	Nematoda (Ascaris sp., Ancylostoma sp. And Enterobius sp. -General characters and classification Annelida. Aereis sp ., Aporrectodea)					

Course Coordinator Prof. Dr.

Dayhoum Abed El-Hamied Mansour El-Basel

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Plant Anatomy (I)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B111	Title	Plant Anatomy (I)			Level	1	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The course provides the students insight of the anatomy of vascular plants by first considering cell structure, the types of cells and tissues found in plants, and finally by looking at the ways the cells and tissues are integrated into stems, leaves, and roots.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recall the anatomy of a generalized plant cell, basic types of plant cells
	a2	State the location and structure of the primary meristems and the plant simple & complex tissues
	a3	Label the arrangement various cells and tissues to create a functional structure.
	a4	List the structure of the root, stem and leaf in terms of complex tissues that comprise it.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Classify the anatomy of a generalized plant cell, basic types of plant cells and the plant complex tissues
	b2	Describe the location and structure of the primary meristems the cell types they form.



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	b3	Illustrate the arrangement various cells and tissues to create a functional structure of root, stem and leaf.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Demonstrate ability to work in groups.
	d2	study and find information independently
4-Contents	1	Anatomy of a generalized plant cell
	2	components of the Plant Cell
	3	The Plant tissues (Meristematic and perminant tissues)
	4	Complex Vascular tissues
	5	Dermal tissues
	6	Ground tissue system
	7	Anatomy of Root system
	8	Anatomy of Monocot & dicot root
	9	Anatomy of Shoot system (Monocot & dicot stem)
	10	Anatomy of Dicot & Monocot leaf
	11	Revision
5- Teaching and learning method	1	Lecture ☐
	2	Discussion ☐
	3	Practical ☐
	4	Homework ☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam.		
	2	Practical exam		
	3	Sheet (oral or written).		
	4	Mid- term exam		
b-Assessment Schedule	1	Final written exam.	15	
	2	Practical exam	14	
	3	Sheet (oral or written).	14	
	4	Mid- term exam	8	
c-Weighting of Assessments	1	Final written exam.	35	70.00%
	2	Practical exam	10	20.00%
	3	Sheet (oral or written).	2.5	5.00%
	4	Mid- term exam	2.5	5.00%
8-List of References				
a-Course notes	1	Course notes prepared by the staff		
b-Essential Books(text books)	1	Panday, B.P. An introduction to plant anatomy. 1993. S. Chand & Co. LTD. New Delhi		
c-Suggested Books	1	Evert, R.F. and Eichhorn, S.E. 2006. Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function, and Development, 3rd Edition. ISBN: 978-0-471-73843-5. 624 pages		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Anatomy of a generalized plant cell	1	a1 ,	b1 ,	c1 ,	d1 ,
2	components of the Plant Cell	2	a1 ,	b1 ,		d2 ,
3	The Plant tissues (Meristematic and perminant tissues)	3	a2 ,	b2 ,	c1 ,	
4	Complex Vascular tissues	4	a2 ,	b1 ,	c1 ,	
5	Dermal tissues	5	a2 ,	b1 ,	c1 ,	
6	Ground tissue system	6	a3 ,	b1 ,	c1 ,	d1 ,
7	Anatomy of Root system	7,8	a4 ,	b3 ,		d1 ,
8	Anatomy of Monocot & dicot root	9	a4 ,	b3 ,	c1 ,	d1 ,
9	Anatomy of Shoot system (Monocot & dicot stem)	10,11	a4 ,	b3 ,	c1 ,	d1 ,
10	Anatomy of Dicot & Monocot leaf	12,13	a4 ,	b3 ,	c1 ,	d2 ,
11	Revision	14				

Course Coordinator Prof. Dr. **Wael Mohamed El-Sayed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Plant Morphology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B151	Title	Plant Morphology			Level	1	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: to familiarize students with the external features of the plant including roots, stems and leaves.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recall how plants are originated from seeds
	a2	State the morphology of roots, stem and leaves.
	a3	Label how the different plant organs are adapted to their function
	a4	List the modifications of stems and leaves
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe how plants are originated from seeds
	b2	Compare between the morphology of roots, stem and leaves.
	b3	Interpret how the different plant organs are adapted to their function and the modifications of stems and leaves



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c-Professional and practical skills: At the end of the course the student should be able to:	<table><tr><td>c1</td><td>Demonstrate the morphology of different plant organs</td></tr></table>		c1	Demonstrate the morphology of different plant organs																								
c1	Demonstrate the morphology of different plant organs																											
d-General and transferable skills: At the end of the course the student should be able to:	<table><tr><td>d1</td><td>Demonstrate ability in work in group</td></tr></table>		d1	Demonstrate ability in work in group																								
d1	Demonstrate ability in work in group																											
4-Contents	<table><tr><td>1</td><td>Seed structure</td></tr><tr><td>2</td><td>Seed germination</td></tr><tr><td>3</td><td>Root system and root zones</td></tr><tr><td>4</td><td>Root morphology</td></tr><tr><td>5</td><td>Morphology of stem</td></tr><tr><td>6</td><td>Mid-Term Exam</td></tr><tr><td>7</td><td>Metamorphosis of stem</td></tr><tr><td>8</td><td>Types of buds</td></tr><tr><td>9</td><td>Leaf structure</td></tr><tr><td>10</td><td>Morphology of leaves</td></tr><tr><td>11</td><td>Metamorphosis of leaves</td></tr><tr><td>12</td><td>Practical and oral Exam</td></tr><tr><td>13</td><td>Final Exam</td></tr></table>		1	Seed structure	2	Seed germination	3	Root system and root zones	4	Root morphology	5	Morphology of stem	6	Mid-Term Exam	7	Metamorphosis of stem	8	Types of buds	9	Leaf structure	10	Morphology of leaves	11	Metamorphosis of leaves	12	Practical and oral Exam	13	Final Exam
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11	Metamorphosis of leaves																											
12	Practical and oral Exam																											
13	Final Exam																											
5- Teaching and learning method	<table><tr><td>1</td><td>Lecture</td><td>☐</td></tr><tr><td>2</td><td>Discussion</td><td>☐</td></tr><tr><td>3</td><td>Practical</td><td>☐</td></tr><tr><td>4</td><td>Homework</td><td>☐</td></tr></table>		1	Lecture	☐	2	Discussion	☐	3	Practical	☐	4	Homework	☐														
1	Lecture	☐																										
2	Discussion	☐																										
3	Practical	☐																										
4	Homework	☐																										



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination.		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination.	14	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-term Examination	35	70.00%
	3	Oral Examination.	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Course notes prepared by the staff		
b-Essential Books(text books)	1	Moore. D.M. (1982) Green Planet, the Story of Plant Life on Earth. Cambridge University Press Cambridge		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Seed structure	1	a1 ,	b1 ,	c1 ,	d1 ,



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2	Seed germination	2,3	a1 ,	b1 ,	c1 ,	d1 ,
3	Root system and root zones	4	a2 ,	b2 ,	c1 ,	d1 ,
4	Root morphology	5,6	a2 ,		c1 ,	d1 ,
5	Morphology of stem	7	a2 ,	b3 ,	c1 ,	d1 ,
6	Mid-Term Exam	8				
7	Metamorphosis of stem	8,9	a3 , a4 ,		c1 ,	d1 ,
8	Types of buds	10	a2 ,		c1 ,	d1 ,
9	Leaf structure	11	a2 ,	b3 ,	c1 ,	d1 ,
10	Morphology of leaves	12	a2 ,	b2 ,	c1 ,	d1 ,
11	Metamorphosis of leaves	13	a3 , a4 ,		c1 ,	d1 ,
12	Practical and oral Exam	14				
13	Final Exam	15				

Course Coordinator Prof. Dr. Hesham Elfayou

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Faculty of Science



Course Specification For **Physical chemistry (2)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C142	Title	Physical chemistry (2)	Level	1	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	The overall aims of the study of this course is: The aim of this course to familiarize the students with the basics of physical chemistry , the states and properties of matter, elements, compound, and mixtures, chemical reactions and chemical equations.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Give the relationships between matter and its properties
	a2	Describe the differences between, element, compounds and mixtures.
	a3	Summarize the rules of chemical reactions and chemical equation.
	a4	Tell the limiting and excess reactants.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Perform chemical calculations using chemical formulas and equations.
	b2	Formulate the different states and properties of matter
	b3	Interpret the relationship between electronic configuration of elements and their periodic properties and chemical reactivity.



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	b4	Predict chemical properties and chemical bonding	
	b5	Predict the structure, chemical reactions and reaction in solutions.	
	b6	Analyze limiting and excess reactants.	
	b7	Solve different problems relating to the course topics	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Handle safely chemical materials, taking into account their physical and chemical properties, including any specific dangers associated with their use.	
	c2	Dissect data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.	
	c3	Use data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Use and implement efficient modes of working.	
	d2	interact with other people and to engage in team –working	
4-Contents	1	The scientific method	
	2	Matter and its properties	
	3	Element, compounds and Mixtures.	
	4	Symbol, formula and Equations.	
	5	Atoms, Molecules and Mole	
	6	Chemical formulas.	
	7	Review Questions and Chemical Equation.	
	8	Chemical reactions and Chemical Equation	
	9	Limiting and excess reactants	
	10	Reaction in solutions	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Homework	☐



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6- Teaching and learning methods for students with limited capacity		Not Aavailable.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	B.A.Sabra “Physical Chemistry 1st year “Note 2002	
b-Essential Books(text books)	1	Warbechten Galiners Albert, Physical electricity, 1968	
	2	Physical chemical calculations, M. M. Elsaywy, 1983	
c-Suggested Books	1	"Physical chemistry" in the library	
d-Scientific periodicals or Publications	1	Periodicals, Web sites, ...	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	The scientific method	1	a1 ,	b1 ,	c1 ,	d1 , d2 ,
2	Matter and its properties	2	a1 ,	b1 ,	c1 , c2 ,	d1 , d2 ,
3	Element, compounds and Mixtures.	3	a2 ,	b3 ,	c2 ,	d1 , d2 ,
4	Symbol, formula and Equations.	4	a3 ,	b1 ,	c2 ,	d2 ,
5	Atoms, Molecules and Mole	5	a3 , a4 ,	b3 , b4 , b6 ,	c2 , c3 ,	d1 , d2 ,
6	Chemical formulas.	6,7	a3 ,	b1 , b4 ,	c2 , c3 ,	d1 , d2 ,



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7	Review Questions and Chemical Equation.	8	a1 , a2 , a3 ,	b1 , b2 , b3 ,	c2 , c3 ,	d1 , d2 ,
8	Chemical reactions and Chemical Equation	9	a3 ,	b1 , b3 , b4 , b5 ,	c2 , c3 ,	d1 , d2 ,
9	Limiting and excess reactants	10,11	a3 , a4 ,	b4 , b6 ,	c1 , c2 , c3 ,	d1 , d2 ,
10	Reaction in solutions	12,13	a1 , a2 , a4 ,	b4 , b5 ,	c1 , c2 , c3 ,	d1 , d2 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Organic chemistry (1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C121	Title	Organic chemistry (1)			Level	1	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course aims to familiarize the students with the basic concepts of organic chemistry, the chemistry of carbon, types of bonds and hybridization of the carbon atoms. Know different methods of nomenclature of organic compounds as well as their properties and chemical reactions.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define the functional groups
	a2	Explain the preparation and reactions of Alkanes, Alkenes.
	a3	Identify alkynes, Alcohols, Alkanals, Alkanones, Alkanoic acids and Amines.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Conclude the preparation and reactions of the different functional groups.
	b2	Link and compare between the different alkanols, and different Amines such primary, secondary and tertiary etc.
	b3	Identify the names reactions for examples Grignard reaction, Wurts. reation, Cannizarros reation, Aldolreation, Victor mayer test, Sorensen test and so on.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Inject self learning.	
	c2	Perform synthesis different types of organic compound.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team	
	d2	Present independent investigative skills by using textbooks and other sources (Internet, Library,	
4-Contents	1	Bonding and Hybridization	
	2	Alkanes (nomenclature, preparation and reactions)	
	3	Alkenes and alkynes (nomenclature, preparation and reactions)	
	4	Alcohols (mono, di and trihydric alcohols) (nomenclature, preparation and reactions)	
	5	Review Questions and Problems.	
	6	Ethers,	
	7	Aldehydes and ketones	
	8	Review questions and problems.	
	9	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Practical	☐
	4	Homework	☐
6- Teaching and learning methods for students with limited capacity		Not Available.	
7-Student Assessment Methods			
a-Using Assessment	1	Mid-Term Examination	
	2	Final written Exam.	
	3	Practical Examination	
	4	Oral Examination	



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b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final written Exam.	15	
	3	Practical Examination	14	
	4	Oral Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final written Exam.	55	73.33%
	3	Practical Examination	15	20.00%
	4	Oral Examination	2.5	3.33%
8-List of References				
a-Course notes	1	Note about the principle of organic chemistry (part-I		
b-Essential Books(text books)	1	Finar volume 1 (1985- Longman)		
	2	Mareson and Boyer, 1983, Alyn and Bacon. Inc.		
	3	OrganicChemistry books, (in general)		
c-Suggested Books	1	Organic Books		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Bonding and Hybridization	1	a1 , a2 ,	b1 ,	c1 ,	d1 ,
2	Alkanes (nomenclature, preparation and reactions)	2-3	a1 , a2 ,	b1 ,	c1 ,	d1 ,
3	Alkenes and alkynes (nomenclature, preparation and reactions)	4-5	a1 , a2 ,	b1 ,	c1 , c2 ,	d1 , d2 ,



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4	Alcohols (mono, di and trihydric alcohols) (nomenclature, preparation and reactions)	6-8	a1 , a3 ,	b1 , b3 ,	c1 , c2 ,	d1 , d2 ,
5	Review Questions and Problems.	8-9			c1 , c2 ,	d1 , d2 ,
6	Ethers,	9-10	a1 ,	b1 , b3 ,	c1 , c2 ,	d1 , d2 ,
7	Aldehydes and ketones	10-12	a1 , a3 ,	b1 , b3 ,	c1 , c2 ,	d1 , d2 ,
8	Review questions and problems.	13			c1 , c2 ,	d1 , d2 ,
9	Revision	14				

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FFSFU DB



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Course Specification For

Introductory Differential and Integral calculus

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Mathematics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	M114	Title	Introductory Differential and Integral calculus		Level	1	Semester	1
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge, apply and analyze the basic concepts of the real functions and their domains ranges, limits, continuity, derivatives and integration.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define Real number and inequalities, Domain, Co-domain and range of all types of the real function. Also define continuity, differentiation and integration of real functions.
	a2	Study some application of differentiation and integration in mathematics and in other subject such biology and geology.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	How to calculate limit, derivative and integrals of the real functions. Also, how to discuss the continuity of real functions.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Store laws to prove and solve different problems relating to the course.	
	c2	Be proficient in using theorems to solve problems	
d-General and transferable skills: At the end of the course the student should be able to:	d1	(Learning) study and find information independently.	
	d2	(Solving problems) set aims, targets, objectives and plane to meet them with deadline.	
4-Contents	1	Real numbers, inequalities, Real functions, and elementary functions	
	2	Limits of functions, Continuity of functions	
	3	The derivative of real functions and derivatives of elementary functions	
	4	Applications of differentiation (extrema, minima and slope of the curve)	
	5	Indefinite integration of elementary functions	
	6	Definite integration and their algebra	
	7	Simple Methods of integration (substitutions method)	
	8	Applications of integration (the area between curves)	
5- Teaching and learning method	1	lecture	☒
	2	Discussion	☒
	3	Homework	☒
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment	1	Final written	
	2	oral	



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	3	Mid- term		
	4	Semester work		
b-Assessment Schedule	1	Final written	15	
	2	oral	14	
	3	Mid- term	8	
	4	Semester work	om all weeks	
c-Weighting of Assessments	1	Final written	40	80.00%
	2	oral	2.5	5.00%
	3	Mid- term	5	10.00%
	4	Semester work	2.5	5.00%
8-List of References				
a-Course notes	1	Courses notes prepared by staff members of math Department.		
b-Essential Books(text books)	1	Single variable calculus By Stewart, James, c 2008		
c-Suggested Books	1	calculus of a single variable By Larson Ron 2010 Differential and integral calculus"; N. Piskunov		
d-Scientific periodicals or Publications	1	www.books.google.com		
	2	http://library.nu		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Real numbers, inequalities, Real functions, and elementary functions	1	a1 ,		c1 ,	d1 , d2 ,
2	Limits of functions, Continuity of functions	2	a1 , a2 ,	b1 ,	c1 ,	d1 , d2 ,



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3	The derivative of real functions and derivatives of elementary functions	3-5	$a_1, a_2,$	$b_1,$	$c_1, c_2,$	$d_1, d_2,$
4	Applications of differentiation (extrema, minima and slope of the curve)	6	$a_1, a_2,$	$b_1,$	$c_2,$	$d_1, d_2,$
5	Indefinite integration of elementary functions	7	$a_1, a_2,$	$b_1,$	$c_1, c_2,$	$d_1, d_2,$
6	Definite integration and their algebra	9	$a_2,$	$b_1,$	$c_1, c_2,$	$d_1, d_2,$
7	Simple Methods of integration (substitutions method)	10,12	$a_2,$	$b_1,$	$c_1, c_2,$	$d_1, d_2,$
8	Applications of integration (the area between curves)	13,14	$a_1, a_2,$	$b_1,$	$c_2,$	$d_1, d_2,$

Course Coordinator Prof. Dr.

محمود بسيوني

Program Coordinator Prof. Dr.

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Date: 2016



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Course Specification For

Properties of Matter & Heat

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Physics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	P112	Title	Properties of Matter & Heat	Level	1	Semester	1
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)	1	Credit hour (h/w)	2

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge of the basic concepts of Properties of matter and heat (Units and dimensions, Simple Harmonic Motion, Elastic Properties of Solids, Fluid Mechanics, Surface Tension, Heat and Temperature, Thermal equilibrium and Zeroth law of thermodynamics, Temperature scales, thermal expansion of materials, Internal Energy, Specific Heat and Calorimetry, Mechanisms of Heat Transfer

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate what the fundamental quantities of mechanics are, and the units physicists use to measure them.
	a2	Mention the most important motions of bodies like the simple harmonic motion (S.H.M), and list some examples of (S.H.M) and the properties of this motion
	a3	Give an account of the elastic properties of solid
	a4	State Pascal's law and Archimedes' principle
	a5	Define the nature of a fluid, viscosity, surface tension
	a6	Illustrate what is meant by the pressure in a fluid
	a7	Tell the difference between the meaning of heat and temperature



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	a8	Illustrate the meaning of thermal equilibrium and what thermometers really measure.
	a9	Define thermal expansion coefficient, specific heat and the heat capacity
b- Intellectual skills: At the end of the course the student should be able to:	b1	Link between the different systems of unit
	b2	Apply the ideas of simple harmonic motion to different physical situations
	b3	Formulate different types of elasticity (normal, bulk and shear).
	b4	Apply Pascal's law to the car lift
	b5	Apply Archimedes' principle to a submerged object as well as a Floating Object.
	b6	Apply surface tension equation
	b7	Interpret the different between temperature and heat
	b8	Link the thermal coefficient of linear expansion to coefficient of area as well as volume expansion
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use dimensional analysis rules to correct a physical formula
	c2	Design some experiments in the laboratory
	c3	Present experimental results in tables and graphs
	c4	Use mathematical tools and techniques to analyze and interpret experimental results
	c5	Collect information to solve different problems relating to the pressure, elasticity and heat.
	c6	Use Stokes' law to calculate the viscosity of the fluid.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Manage time
	d2	Acquire self-and long life-learning
	d3	Write scientific report
	d4	Think independently, solve problems on scientific basis
	d5	Work in a team to conduct an experiment in physics lab
4-Contents	1	Units and dimensions
	2	Simple Harmonic Motion and its examples and properties
	3	Elastic Properties of Solids
	4	Fluid Mechanics -Density -Variation of pressure of fluid with depth



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	5	Archimedes' principle Viscosity		
	6	Surface Tension		
	7	Temperature -Thermal equilibrium and Zeroth law of thermodynamics -Measuring temperature -Temperature scales: Celsius, Fahrenheit and Kelvin scales.		
	8	Thermal expansion of materials.		
	9	Heat and Internal Energy Specific Heat and Calorimetry -Latent heat and phase changes		
	10	Heat Transfer Mechanisms: 1. Conduction, 2. Convection, 3. Radiation		
5- Teaching and learning method	1	lecture	☐	
	2	Discussion.	☐	
	3	Practical.	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-term Examination		
	3	Oral Examination		
	4	Practical exam		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-term Examination	8	
	3	Oral Examination	13	
	4	Practical exam	13	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid-term Examination	2.5	5.00%
	3	Oral Examination	2.5	5.00%
	4	Practical exam	10	20.00%



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8-List of References		
a-Course notes		
b-Essential Books(text books)	1	R. A. Serway, J. W. Jewett " Physics for scientists and engineers", Thomson, 2004.
	2	D. Halliday, R. Resnick and J. Walker" Fundamentals of Physics", fifth Ed., John Wiley & Sons, New York, 1997.
c-Suggested Books	1	P. M. Fishbane, S. G. Gasiorowicz, S. T. Thornton, "Physics for scientists and engineers with modern physics", Pearson Prentice Hall, Upper Saddle River, NJ, 2005.
	2	J. D. Wilson, A. J. Buffa, "College Physics", 5ed, Prentice Hall, (2003).
	3	P. A. Tipler, "Physics for scientists and engineers", W.H. Freeman/Worth Publishers, New York, NY, 1999
d-Scientific periodicals or Publications	1	Library.

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Units and dimensions	1	a1	b1	c1	d1, d2
2	Simple Harmonic Motion and its examples and properties	2,3	a2	b2, b3	c2, c3, c4	d1, d2, d3, d4, d5
3	Elastic Properties of Solids	4	a3	b4	c5	d1, d2, d3
4	Fluid Mechanics -Density - Variation of pressure of fluid with depth	5	a4, a5, a6	b5	c2, c3, c4, c5	d1, d2, d3, d4, d5
5	Archimedes' principle Viscosity	6	a3, a5	b6	c2, c3, c4, c6	d1, d2, d3, d4, d5
6	Surface Tension	7	a5	c1,c2,c3	b7	d1, d2, d3, d5



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7	Temperature -Thermal equilibrium and Zeroth law of thermodynamics - Measuring temperature - Temperature scales: Celsius, Fahrenheit and Kelvin scales.	8,9	a8	b8,a7	c5	d1, d2, d3, d4
8	Thermal expansion of materials.	10	a9	b8	c5	d1, d2, d3, d4
9	Heat and Internal Energy Specific Heat and Calorimetry -Latent heat and phase changes	11,12	a9, a2,a3	b8	c2, c3, c4, c5	d1, d2, d3, d4, d5
10	Heat Transfer Mechanisms: 1. Conduction, 2. Convection, 3. Radiation	13,14	a7	b7	c5,c6	d1, d2, d3, d4, d5

Course Coordinator Prof. Dr. **Abdul Wahab Hamdy Abdul Wahab**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

English

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	E101	Title	English			Level	1	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Developing reading and writing skills using some comprehension passages.
2	In the reading component of the course students work with vocabulary in context, finding specific information, and drawing inferences and conclusions.
3	In addition, students are required to do a written project related to solving a problem in the field of specialization

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Read and Comprehend selected authentic texts and/or supported materials of moderate length (newspaper and magazine articles and manuals) within a less familiar context
	a2	Comprehend high frequency content words
	a3	recognize main, relevant ideas in a text, extract these ideas and reduce them to note form.
	a4	Organize ideas using some pre-writing techniques.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Use context, title, headings and format to predict and determine information about a text.
	b2	Accept some ambiguity in reading passages
	b3	Use context clues to guess meaning of unfamiliar words.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Distinguish between formal and informal language with some effectiveness.
	c2	Understand the rhetorical functions used in scientific study which are classifying, comparing, cause and effect, hypothesizing, defining, exemplifying, giving evidence, experimenting, calculating, reporting, describing and predicting
	c3	respond in written and oral form on issues presented in a given text.
d-General and transferable skills: At the end of the course the student should be able to:	d1	presenting effectively what they have read in oral and written form.
	d2	write, speak, listen and read to succeed in dealing with the materials in the field of specialization.
	d3	Practising grammar skills and language structures useful for communication, including writing and speaking about general subjects.
4-Contents	1	Reading Comprehension: Expansion of Liquids and Gases
	2	Reading Comprehension: Expansion and Contraction of Solids
	3	Reading Comprehension: Floating Bodies
	4	Reading Comprehension: The Growth of Seeds
	5	Reading Comprehension: One Function of Roots
	6	Reading Comprehension: One Function of Leaves
	7	Reading Comprehension: Temperature
	8	Reading Comprehension: Change of State of matter
	9	Reading Comprehension: Stress
	10	Reading Comprehension: Marie Curie: Polish/French Physicist
	11	Reading Comprehension: Solar Energy
	12	Reading Comprehension: A Man of Science



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	13	Reading Comprehension: Man and the Future	
	14	Reading Comprehension: The Media	
	15	Reading Comprehension: Computers	
	16	Grammar: Present simple tense	
	17	Grammar: Present continuous tense	
	18	Grammar: Present perfect tense	
	19	Grammar: Past simple tense	
	20	Grammar: Future simple tense	
	21	Grammar: Interrogation	
	22	Grammar: Active and passive voice	
	23	Grammar: Prepositions	
	24	Grammar: Vocabulary and Word Study -Synonyms, - Word Formation -Word Choice - Derivatives	
	25	Writing:(i) Summary writing skills(The students with the necessary skills to identify the main points and important details through good global comprehension to render the text into note form and write out the summary based on these notes.	
	26	Writing:(ii) Expository/Synthesis Writing (Project) This activity provides students with the necessary skills at different stages of producing an extended piece of academic writing.	
	27	Speaking: (i) In-class oral activities / participation. Students will be given opportunity to interact with one another based on what they have read and also give opinions and ideas in discussion activities.	
	28	Speaking: (ii) Oral presentation based on the project Students will learn how to present scientific concepts and information effectively.	
	29	Translation: Students are taught how to translate some selected passages form English to Arabic. Most of these passages are taken from the Comprehension Passages.	
	30		
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Practical exam	to assess writing and comprehension.	
	3	Mid-Term Examination	2.Reports to assess reading and writing.	
	4	oral exam	to assess spoken English (Presentation)	
b-Assessment Schedule	1	Final-term Examination	15	
	2	Practical exam	13	
	3	Mid-Term Examination	8	
	4	oral exam	on all term	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Practical exam	10	20.00%
	3	Mid-Term Examination	2.5	5.00%
	4	oral exam	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Abdel Salam, Ahmad M. College English: Science. Fayoum: Dar Al-Elm Publishing House.		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Reading Comprehension: Expansion of Liquids and Gases	1	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
2	Reading Comprehension: Expansion and Contraction of Solids	2	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
3	Reading Comprehension: Floating Bodies	3	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
4	Reading Comprehension: The Growth of Seeds	4	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
5	Reading Comprehension: One Function of Roots	5	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
6	Reading Comprehension: One Function of Leaves	6	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
7	Reading Comprehension: Temperature	7	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
8	Reading Comprehension: Change of State of matter	8	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
9	Reading Comprehension: Stress	9	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
10	Reading Comprehension: Marie Curie: Polish/French Physicist	9	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
11	Reading Comprehension: Solar Energy	10	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
12	Reading Comprehension: A Man of Science	11	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
13	Reading Comprehension: Man and the Future	12	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
14	Reading Comprehension: The Media	13	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
15	Reading Comprehension: Computers	14	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
16	Grammar: Present simple tense	1	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,



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17	Grammar: Present continuous tense	2	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
18	Grammar: Present perfect tense	3	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
19	Grammar: Past simple tense	4	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
20	Grammar: Future simple tense	5	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
21	Grammar: Interrogation	6	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
22	Grammar: Active and passive voice	7	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
23	Grammar: Prepositions	8	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
24	Grammar: Vocabulary and Word Study -Synonyms, - Word Formation -Word Choice - Derivatives	9	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
25	Writing:(i) Summary writing skills(The students with the necessary skills to identify the main points and important details through good global comprehension to render the text into note form and write out the summary based on these notes.	10	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
26	Writing:(ii) Expository/Synthesis Writing (Project) This activity provides students with the necessary skills at different stages of producing an extended piece of academic writing.	11	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,



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27	Speaking: (i) In-class oral activities / participation. Students will be given opportunity to interact with one another based on what they have read and also give opinions and ideas in discussion activities.	12	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
28	Speaking: (ii) Oral presentation based on the project. Students will learn how to present scientific concepts and information effectively.	13	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,
29	Translation: Students are taught how to translate some selected passages from English to Arabic. Most of these passages are taken from the Comprehension Passages.	14	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



FIRST LEVEL

SECOND SEMESTER



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Course Specification For **Introductory Zoology (2)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z112	Title	Introductory Zoology (2)			Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: a-To enable students to acquire an appropriate functional background of cell, tissues, organs and systems. b-To enable students to explore in detail the function of the digestive, excretory, respiratory, the neuromuscular and cardiovascular systems.
2	Be familiar with the structure of the animal cell. •understand the components of the animal cell (the organelles). •be familiar with histology and tissues types. •correlate between the histological structure & functions of various tissues & organs. •know practically the normal organs under the microscope & differentiate between them.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	explain the cellular functions at the organelle and molecular level
	a2	explain the function of digestive system, and excretory system
	a3	illustrate the structure of, respiratory system, cardiovascular system and different components of blood both grossly and at



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		the molecular level
	a4	define normal cell and histological structure of various tissues.
	a5	illustrate various levels of sections in the epithelial, connective, muscular and nervous tissues.
	a6	explain various endocrine and exocrine glands
	a7	illustrate the various tissues and organs under the microscope
b- Intellectual skills: At the end of the course the student should be able to:	b1	compare between histological structure & function of any cell or organ
	b2	compare between different slides from those seen during his course but of the same organs previously studied
	b3	analyze the most important physiological laboratory results
	b4	measure the hemoglobin content , urine content .
c-Professional and practical skills: At the end of the course the student should be able to:	c1	perform experiments in the laboratory to measure the urine constituents percent and blood groups
	c2	Perform hematological tests, Blood cell count hemoglobin
	c3	dissect most systems of the toad
	c4	use various types of special stains for various organs
	c5	identified ultra structure of different cells studied in various organs
	c6	Differentiate between different organs in histological slid under the microscope
d-General and transferable skills: At the end of the course the student should be able to:	d1	study and find information independently
	d2	work coherently and successfully as a part of a team in projects
	d3	communicate information effectively to special and non specialist audiences
	d4	An ability to undertaken appropriate further professional training
4-Contents	1	cells as the living units of the body
	2	Nutrition – Digestion and metabolism
	3	Circulatory system and respiratory system
	4	Excretory system and nervous system



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	5	Introduction, micro techniques		
	6	Cytology – Epithelial tissue and connective tissue		
	7	Cartilage – bone – muscle – blood vascular and nervous tissues		
	8	Revision		
5- Teaching and learning method	1	lecture	✓	
	2	Discussion.	✓	
	3	Practical.	✓	
	4	Homework	✓	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Medical Cell Biology + Cell biology + basic histology		
b-Essential Books(text books)	1	"Text Book of physiology", Emslie-Smith, paterson, Sc ratcherd, Read, 7th edition, (1988) , Donald Elsie – Smith		



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	2	" Principles of animal physiology", Dennis W. Woud ,Third edition(1983), Arther J. Willis.
c-Suggested Books		
d-Scientific periodicals or Publications	1	Cell and histology Journals
	2	Histochemistry and Cytochemistry Journals
	3	Histochemistry and Cell Biology Journal

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	cells as the living units of the body	1	a4 ,	b1 ,	c3 ,	d1 ,
2	Nutrition – Digestion and metabolism	2 - 6	a2 ,	b1 , b4 ,	c2 ,	d3 ,
3	Circulatory system and respiratory system	7 - 10	a3 ,	b1 , b4 ,	c1 , c2 ,	d3 ,
4	Excretory system and nervous system	11-13	a2 ,	b1 , b4 ,	c1 , c2 ,	d2 ,
5	Introduction, micro techniques	1-2	a2 ,	b3 ,	c3 ,	d3 ,
6	Cytology – Epithelial tissue and connective tissue	3-9	a1 , a2 , a4 ,	b1 , b2 ,	c4 ,	d3 ,
7	Cartilage – bone – muscle – blood vascular and nervous tissues	10-13	a2 , a4 ,	b2 ,	c4 ,	d3 ,
8	Revision	14				

Course Coordinator Prof. Dr. **Ayman Mustafa Abdel-Aziz**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Basics of Histology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z121	Title	Basics of Histology			Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Describe the methods of studying cells and tissues
2	Mention and describe the different types of tissues
3	Mention and describe the specific characteristic of cell components in relation to the functions of each component
4	Appreciate (explain) the reflection of the method used on the picture observed and become familiar (with the various methods and their applications.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:

a1	Mention the basic steps in preparing specimens for light and electron microscopy.
a2	Define and describe the histological characteristics of normal cells
a3	Define and describe the structure and functions of the cytoplasmic components.
a4	Describe the subunits of each nuclear component and their role in its function
a5	Explain the process of cell division and identify the activities that control the transition from each phase of the cell cycle to



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		the other.
	a6	Differentiate between normal and abnormal karyotyping
	a7	Describe the structural characteristics of the four basic tissue types
	a8	Describe the functional capabilities of each tissue type and relate them to the structure.
	a9	Describe and compare between different blood elements and their development.
	a10	Define and discuss the basic histological structure of some systems (Vascular, Lymphatics, & skin)
b- Intellectual skills: At the end of the course the student should be able to:	b1	Correlate between histological structure & function of any cell or tissue
	b2	Select appropriate methods to reveal specific microscopic features of cells and tissues.
	b3	Diagnose slides different from those seen during his course but of the same organs or tissues previously studied.
	b4	Distinguish between normal and abnormal karyotyping
	b5	Interpret a complete blood picture report
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Name the instruments and techniques used to prepare and study histological specimens
	c2	Use the microscope efficiently.
	c3	Handle the histological glass slides and examine them using the maximum microscopic facilities.
	c4	Identify various types of stains & micro techniques
	c5	Identify different cell organelles
	c6	Identify different blood cells in blood films
	c7	Identify and differentiate between different types of epithelium, connective tissue cells, connective tissue proper & bone cells
	c8	Differentiate between different tissues and organs in histological slide seen under the microscope
	c9	Make a differential leucocytic count using the blood film



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d-General and transferable skills: At the end of the course the student should be able to:	d1	Appreciate the importance of life long learning and show a strong commitment to it		
	d2	Use the sources of biomedical information to remain current with advances in knowledge and practice		
4-Contents	1	Method of studying cells and tissues		
	2	Epithelial Tissues		
	3	Connective tissues		
	4	Cartilage and Bone		
	5	Muscular tissues		
	6	The blood circulatory system		
	7	Nervous tissues		
5- Teaching and learning method	1	lecture		☒
	2	Discussion sessions		☒
	3	Practical sessions to gain practical skills		☒
	4	Practical book for drawing		☒
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%



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	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Notes on histology and Colored Atlas of Histology by staff members of histology Department		
b-Essential Books(text books)	1	JUNQUEIRA HISTOLOGY TEXTSTACK, Eighth Edition, by Junqueira, Carneiro and Kelley.		
c-Suggested Books	1	Bloom & Fawcett: Concise Histology A Hodder Arnold Publication; 1st edition		
d-Scientific periodicals or Publications	1	http://www.med-ed-nline.org/		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Method of studying cells and tissues	1-2	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10 ,	b2 ,	c1 ,	d1 , d2 ,
2	Epithelial Tissues	3,4	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b3 , b4 ,	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,
3	Connective tissues	5,6	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b3 , b4 ,	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,
4	Cartilage and Bone	7,8	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b3 , b4 ,	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,



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5	Muscular tissues	9,19	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b3 , b4 ,	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,
6	The blood circulatory system	11,12	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b1 , b5 ,	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,
7	Nervous tissues	13,14	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 , a9 ,a10	b1	c3 , c2 , c4 , c5 , c6 , c7 , c8 , c9 ,	d1 , d2 ,

Course Coordinator Prof. Dr.

Ayman Mustafa Abdel-Aziz

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **General Plant Physiology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B161	Title	General Plant Physiology			Level	1	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	The overall aims of the study of this course is: to familiarize the students with the basic phenomena and theories related to plant physiology with special concern to their economical importance.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	List Different types of solutions and Factors affecting on enzyme activity, rate of photosynthesis, and rate of respiration
	a2	Recall the following terms Diffusion, Osmosis, Imbibition, Enzyme activity, competitive and non competitive enzyme inhibitors
	a3	List Different types of solutions and Factors affecting on enzyme activity, rate of photosynthesis, and rate of respiration
b- Intellectual skills: At the end of the course the student should be able to:	b1	Classify Different types of solutions and Factors affecting on enzyme activity, rate of photosynthesis, and rate of respiration
	b2	Describe the following terms Diffusion, Osmosis, Imbibition, Enzyme activity, competitive and non competitive enzyme inhibitors



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	b3	Illustrate the light & dark reactions of photosynthesis - glycolysis, krebs and electron transport chain
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Conduct investigations using recent equipment and instruments.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Think independently, set tasks and solve problems on scientific basis
4-Contents	1	Historical Introduction Plant cell structure • Solutions • Colloids • Osmosis • Imbibition
	2	Enzymes • Anabolism & Catabolism • Properties of enzymes • Nomenclature & classification • Enzyme structure • Activation energy • Factors affecting on the rate of enzyme reactions • Enzyme inhibition
	3	Photosynthesis • Important of Photosynthesis • Chloroplasts • Photosynthetic pigments • Excitation of chlorophyll by light • Photosystems • Light-dependent reactions • Light-independent reactions • Factors affecting on Photosynthesis



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	4	Respiration •What is respiration? •ATP structure •Cell respiration •Glycolysis •Krebs cycle •Electron transport chain •Aerobic & anaerobic respiration •Factors affecting respiration		
	5	Practical and oral exam		
	6	Final exam		
5- Teaching and learning method	1	Lecture	☒	
	2	Discussion	☒	
	3	Practical	☒	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written		
	2	Practical exam		
	3	Sheet (oral or written)		
	4	Mid-Term Examination		
b-Assessment Schedule	1	Final written	15	
	2	Practical exam	14	
	3	Sheet (oral or written)	14	
	4	Mid-Term Examination	8	
c-Weighting of Assessments	1	Final written	55	73.33%
	2	Practical exam	15	20.00%
	3	Sheet (oral or written)	2.5	3.33%
	4	Mid-Term Examination	2.5	3.33%



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8-List of References		
a-Course notes	1	Course notes prepared by the staff
b-Essential Books(text books)	1	Hopkins, W. G. &N. P. A. Huner (2004).An Introduction to Plant Physiology (Heywood, V. H. & R. T. Watson, eds) Cambridge University Press.
c-Suggested Books	1	Taiz, L. & E. Zeiger (1998) Plant Physiology 2nd Edition.
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Historical Introduction Plant cell structure •Solutions •Colloids •Osmosis •Imbibition	1	a1 ,	b1 ,	c1 ,	
2	Enzymes •Anabolism & Catabolism •Properties of enzymes •Nomenclature &classification •Enzyme structure •Activation energy •Factors affecting on the rate of enzyme reactions •Enzyme inhibition	2,3	a1 ,	b1 ,		



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3	Photosynthesis • Important of Photosynthesis • Chloroplasts • Photosynthetic pigments • Excitation of chlorophyll by light • Photosystems • Light-dependent reactions • Light-independent reactions • Factors affecting on Photosynthesis	4, 5	a2 ,	b2 ,	c1 ,	
4	Respiration • What is respiration? • ATP structure • Cell respiration • Glycolysis • Krebs cycle • Electron transport chain • Aerobic & anaerobic respiration • Factors affecting respiration	6-13	a3 ,	b3 ,		
5	Practical and oral exam	14				
6	Final exam	15				

Course Coordinator Prof. Dr. **Rasha Kamal Kamel**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Faculty of Science



Course Specification For **Taxonomy of Non-flowering Plant**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B131	Title	Taxonomy of Non-flowering Plant		Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	This course is designed to provide students with the classification, relationships, occurrence, morphology, anatomy, growth cycle, factors affecting growth and economic importance of nonflowering plants as members of plant kingdom

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recall History of plant classification
	a2	List Viruses and virus-like organisms, Bacteria and blue-green algae
	a3	Enumerate, Algae, Fungi, Archconiatæ, Gymnospermae and a brief accounts on angiospermae.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Classify Viruses and virus-like organisms
	b2	Describe Bacteria and blue-green algae, Algae, Fungi, Archconiatæ Gymnospermae and a brief accounts on angiospermae



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c-Professional and practical skills: At the end of the course the student should be able to:	<table><tr><td>c1</td><td>Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.</td></tr></table>			c1	Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.																		
c1	Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.																						
d-General and transferable skills: At the end of the course the student should be able to:	<table><tr><td>d1</td><td>Consider community linked problems, ethics and traditions</td></tr></table>			d1	Consider community linked problems, ethics and traditions																		
d1	Consider community linked problems, ethics and traditions																						
4-Contents	<table><tr><td>1</td><td>Introduction, History of plant classification</td></tr><tr><td>2</td><td>Viruses and virus-like organisms</td></tr><tr><td>3</td><td>Bacteria and blue-green algae.</td></tr><tr><td>4</td><td>Algae.</td></tr><tr><td>5</td><td>Mid term</td></tr><tr><td>6</td><td>Fungi</td></tr><tr><td>7</td><td>Archconiatæ</td></tr><tr><td>8</td><td>Gymnospermae and a brief accounts on angiospermae.</td></tr><tr><td>9</td><td>Practical and oral Exam</td></tr><tr><td>10</td><td>Final Exam</td></tr></table>			1	Introduction, History of plant classification	2	Viruses and virus-like organisms	3	Bacteria and blue-green algae.	4	Algae.	5	Mid term	6	Fungi	7	Archconiatæ	8	Gymnospermae and a brief accounts on angiospermae.	9	Practical and oral Exam	10	Final Exam
1	Introduction, History of plant classification																						
2	Viruses and virus-like organisms																						
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9	Practical and oral Exam																						
10	Final Exam																						
5- Teaching and learning method	<table><tr><td>1</td><td>Lecture</td><td>☒</td></tr><tr><td>2</td><td>Discussion</td><td>☒</td></tr><tr><td>3</td><td>Practical</td><td>☒</td></tr></table>			1	Lecture	☒	2	Discussion	☒	3	Practical	☒											
1	Lecture	☒																					
2	Discussion	☒																					
3	Practical	☒																					
6- Teaching and learning methods for students with limited capacity		Not Availiable.																					
7-Student Assessment Methods																							
a-Using Assessment	<table><tr><td>1</td><td>Final written</td><td></td></tr><tr><td>2</td><td>Practical exam</td><td></td></tr><tr><td>3</td><td>Sheet (oral or written)</td><td></td></tr><tr><td>4</td><td>Mid-Term Examination</td><td></td></tr></table>			1	Final written		2	Practical exam		3	Sheet (oral or written)		4	Mid-Term Examination									
1	Final written																						
2	Practical exam																						
3	Sheet (oral or written)																						
4	Mid-Term Examination																						



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b-Assessment Schedule	1	Final written	15	
	2	Practical exam	14	
	3	Sheet (oral or written)	14	
	4	Mid-Term Examination	8	
c-Weighting of Assessments	1	Final written	35	70.00%
	2	Practical exam	10	20.00%
	3	Sheet (oral or written)	2.5	5.00%
	4	Mid-Term Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Course notes prepared by the staff		
b-Essential Books(text books)	1	K. Stern et al Introductory Plant Biology 9th ed. (McGraw-Hill, 2003)		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction, History of plant classification	1,2	a1 ,	b1 ,		
2	Viruses and virus-like organisms	3,4	a2 ,	b1 ,		
3	Bacteria and blue-green algae.	5,6	a2 ,	b2 ,	c1 ,	d1 ,
4	Algae.	7,8	a3 ,	b2 ,	c1 ,	d1 ,
5	Mid term	8				
6	Fungi	9,10	a3 ,	b2 ,		
7	Archconiatæ	11,12	a3 ,	b2 ,		



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8	Gymnospermae and a brief accounts on angiospermae.	13	a3 ,	b2 ,		
9	Practical and oral Exam	14				
10	Final Exam	15				

Course Coordinator Prof. Dr. **Reda Mohamed Taha**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Inorganic chemistry (1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C131	Title	Inorganic chemistry (1)			Level	1	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	Allow the student to understand the atomic structure and knowing the orbital shape and quantum numbers, to understand the periodic table and periodicity, types of chemical bonding and the geometric structure of compounds through (VSEPR) models.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain the electronic structure and dual nature of light
	a2	Illustrate the Atomic spectrum of Hydrogen.
	a3	Describe the wave mechanical model of the atom and quantum numbers.
	a4	Define e1ectronic configuration and chemical bonding
b- Intellectual skills: At the end of the course the student should be able to:	b1	Evaluate the energy and wave length-of an atom.
	b2	Formulate the Lewis structure for any compound.
	b3	Interpret the geometric structure using VESPR model.
	b4	Interpret the Acidic and basic Radical
	b5	Compare between quantitative and qualitative analysis.
	b6	Analyze the different cations in mixture.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Predict the quantity of heats in exothermic and endothermic reaction.	
	c2	Calculate the effective nuclear charge on any electron.	
	c3	Calculate the oxidation numbers	
	c4	Design the structure of different compounds.	
	c5	Predict the geometry of different compounds.	
	c6	Predict the polarity of different compounds.	
	c7	Name the different compounds.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Discuss different problem related to the course.	
	d2	Perform work in a team	
4-Contents	1	Atomic and electronic structure of atom	
	2	Atomic spectrum of Hydrogen and Bohr theory	
	3	The wave mechanical model of atom	
	4	Quantum number and orbital shape.	
	5	Review Questions and Problems.	
	6	Electronic configuration and periodicity	
	7	Ionic and covalent bond	
	8	Resonance	
	9	Molecular geometry	
	10	Review questions and problems.	
	11	Practical exam	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Practical	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination	to assess the knowledge and the intellectual skills	
	3	Oral Examination	Sheet (oral or written) to assess ability of understanding.	
	4	Practical Examination	to assess manual skill of treatment.	
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination	12	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-term Examination	55	73.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	Written by Dept. stuff		
b-Essential Books(text books)	1	General Chemistry. A. I. T. B. S. publishers & Distributors. Darrell D. Ebbing.		
	2	Introduction to Physical Chemistry, Mark Ladd 3rd Edition, 1999		
c-Suggested Books	1	Advanced Inorganic Chemistry. Sixth Edition, John Wiley&Sons. F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Murillo, Manfred Bochmann		
	2	Inorganic Chemistry. Second Edition, Gary L. Missler, Donald A. Tarr.		
	3	Chemistry. Fourth Edition, PEARSON Prentice Hall. John Mc Murry, Robert C. Fay.		



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d-Scientific periodicals or Publications	1	Web sites

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Atomic and electronic structure of atom	1	a1 ,	b1 ,		d1 , d2 ,
2	Atomic spectrum of Hydrogen and Bohr theory	2	a2 ,			d1 , d2 ,
3	The wave mechanical model of atom	3-4	a3 ,			d1 , d2 ,
4	Quantum number and orbital shape.	4-5	a3 ,			d1 , d2 ,
5	Review Questions and Problems.	5	a1 , a2 , a3 ,	b1 ,	c2 ,	d1 , d2 ,
6	Electronic configuration and periodicity	6-7	a4 ,			d1 , d2 ,
7	Ionic and covalent bond	8-9	a4 ,	b2 , b4 ,	c1 , c2 , c3 ,	d1 , d2 ,
8	Resonance	10	a4 ,	b2 , b4 ,	c1 , c2 , c3 ,	d1 , d2 ,
9	Molecular geometry	11-12	a4 ,	b2 , b3 ,	c4 , c5 , c6 ,	d1 , d2 ,
10	Review questions and problems.	13	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c4 , c5 , c6 ,	d1 , d2 ,
11	Practical exam	14				

Course Coordinator Prof. Dr. **Rania Gaber Mohamed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Organic Chemistry (4)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C124	Title	Organic Chemistry (4)			Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course aims to familiarize the students with the chemistry of other functional group compounds complementary to what have been studied in the 1st semester.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define other differente functional groups
	a2	Explain the preparation and reactions of alkyl halides and sulphur compounds and amines.
	a3	Identify different types of alkyl halides and their nomenclature and nature of carboxylic acids and their derivatives
b- Intellectual skills: At the end of the course the student should be able to:	b1	Know the preparation and reaction of the different functional groups.
	b2	Link and compare between the different alkyl halides, and different Amines such primary, secondary and tertiary etc.
	b3	Identify the names reactions for examples Grignard reaction, Hunsdiecker. reation, Hoffman reation, Heisenberg



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Inject self learning.	
	c2	Perform synthesis different types of organic compound.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team	
	d2	Present independent investigative skills by using textbooks and other sources (Internet, Library,..)	
4-Contents	1	Alkyl halides, nomenclature, types and preparation	
	2	Alkyl halides chemical reactions	
	3	Amines	
	4	Sulphur compounds (thiols and thioethers)	
	5	Review Questions and Problems.	
5- Teaching and learning method	1	lecture	☐
	2	Discussion sessions	☐
	3	Practical sessions to gain practical skills	☐
	4	Practical book for drawing	☐



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6- Teaching and learning methods for students with limited capacity				Not Available.	
7-Student Assessment Methods					
a-Using Assessment	1	Mid-Term Examination			
b-Assessment Schedule	1	Mid-Term Examination	8		
c-Weighting of Assessments	1	Mid-Term Examination			
8-List of References					
a-Course notes	1	Written by Dept. stuff			
b-Essential Books(text books)					
c-Suggested Books					
d-Scientific periodicals or Publications					

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Alkyl halides, nomenclature, types and preparation	1-2			c1 ,	d1 ,
2	Alkyl halides chemical reactions	2-3	a1 , a2 ,	b1 ,	c1 ,	d1 ,
3	Amines	4	a1 , a2 ,	b1 ,	c1 , c2 ,	d1 , d2 ,
4	Sulphur compounds (thiols and thioethers)	5	a1 , a3 ,	b1 , b3 ,	c1 , c2 ,	d1 , d2 ,
5	Review Questions and Problems.	6			c1 , c2 ,	d1 , d2 ,



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Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For Algebra and Geometry

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Mathematics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	M117	Title	Algebra and Geometry			Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge, apply and analyze the basic concepts of algebra and geometry (Mathematical logic, Mathematical induction, Determinants, Relations and functions, Coordinates, Straight lines, Circles and Conic (Parabola, Ellipse and Hyperbola).

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	define the statement
	a2	mention the truth tables for connectives of logic
	a3	list the axioms of mathematical induction
	a4	tell the properties of determinants
	a5	state the kinds of relations
	a6	list the kinds and properties of functions
	a7	illustrate the Cartesian and polar coordinates
	a8	mention the different forms of the straight line
	a9	give an account of the general form of the circle
	a10	explain the graph of parabola, ellipse and hyperbola



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b- Intellectual skills: At the end of the course the student should be able to:	b1	analyze the properties of determinants to solve system of linear equations	
	b2	interpret how use the mathematical logic to prove theorems	
	b3	create different kinds of proofs using the principle of mathematical induction	
	b4	compare between parabola, ellipse and hyperbola	
	b5	link between Cartesian and polar coordinates	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	design and solve different problems by using determinants	
	c2	collect data with logical thinking to solve some problems	
	c3	use the axioms of mathematical induction to solve some problems related to mathematics such as physics using the principle of mathematical induction	
	c4	design some forms in geometry using forms of circles, parabola and ellipse. pse and hyperbola	
d-General and transferable skills: At the end of the course the student should be able to:	d1	write a report with the standard scientific guidelines	
	d2	work coherently and successfully as a part of a team in project.	
	d3	use appropriate computer program, packages and download on line data.	
	d4	gain a communication skills (present reports in seminars, workshops or group meeting).	
	d5	study and find information independently	
	d6	manager its time.	
4-Contents	1	Mathematical logic	
	2	Mathematical induction.	
	3	Determinants.	
	4	Relations and Functions.	
	5	Coordinates and straight lines	
	6	Circles, parabola, ellipse and hyperbola	
5- Teaching and learning method	1	lecture	☐
	2	Discussion sessions	☐
	3	Practical sessions to gain practical skills	☐



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	4	Practical book for drawing		
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written		
	2	oral exam		
	3	Mid- term exam.		
	4	Semester work		
b-Assessment Schedule	1	Final written	15	
	2	oral exam	13	
	3	Mid- term exam.	8	
	4	Semester work		
c-Weighting of Assessments	1	Final written	35	70.00%
	2	oral exam	2.5	5.00%
	3	Mid- term exam.	2.5	5.00%
	4	Semester work	2.5	5.00%
8-List of References				
a-Course notes	1	Courses notes prepared by staff members of math. department.		
b-Essential Books(text books)	1	Algebra and trigonometry by Larson, Hostetier and Edwards 2nd Edition (1997), Houghton miffm corn. Boston.		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills



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1	Mathematical logic	Week of study	a1 , a2 ,	b2	c2	d1 , d2 , d3 , d4 , d5 , d6 ,
2	Mathematical induction.	1,2	a3	b3	c3	d1 , d2 , d3 , d4 , d5 , d6 ,
3	Determinants.	3,4	a4	b1	c1	d1 , d2 , d3 , d4 , d5 , d6 ,
4	Relations and Functions.	5,6	a5,a6	b2	c3	d1 , d2 , d3 , d4 , d5 , d6 ,
5	Coordinates and straight lines	7,8	a7,a8	b5	c3	d1 , d2 , d3 , d4 , d5 , d6 ,
6	Circles, parabola, ellipse and hyperbola	11-14	a9,a10	b4	c4	d1 , d2 , d3 , d4 , d5 , d6 ,

Course Coordinator Prof. Dr. خديجة

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Optics and Electricity**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Physics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	P134	Title	Optics and Electricity			Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge of the basic concepts of optics, Electricity and Magnetism (Reflection and Refraction of Light, Huygens' Principle, Images, Eye, Optical Instruments, Electric Force, Electric Field, Gauss's Law, Electric Potential, Electric Circuit and its Components).

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain what light rays are, and how they are related to the wavefronts.
	a2	Define the laws of reflection and refraction
	a3	Describe the Huygens' Principle and its Applications
	a4	Define the image and list its types
	a5	Illustrate what aspects of a lens determine the type of image that it produces.
	a6	Define the forces between charges.
	a7	Recognize electric fields and potential and their application in everyday life.
	a8	State Gauss's Law
	a9	Explain basic components of electric circuits and their



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		role in achieving the required electric circuits output.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Evaluate some phenomena in optics
	b2	Apply Snell's law to a slab of glass
	b3	Measure the power of both mirror and lens.
	b4	Interpret the equivalent power of separated thin or thick lenses
	b5	Compare between Newton's law of universal gravitation and Coulomb's law.
	b6	Evaluate the electric field due to a group of point charges, a continuous charge distribution, a charged rod, a uniform charged ring, a uniformly charged disk
	b7	Interpret the differences between linear, surface, and volume charge densities.
	b8	Apply Gauss's law to various charge distributions.
	b9	Relate electric potential to an electric field and conservation of energy.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use the index of refraction to determine the effect of a medium on light's speed and wavelength.
	c2	Design mirrors and lenses to form images with desired characteristics
	c3	Use laws of electricity, e.g., Coulomb's Law and Gauss's law, to solve problem sheets.
	c4	Use Coulomb's law to calculate the electric field of a given charge distribution
	c5	Design some electric circuits using different combinations of resistors and capacitors.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Manage time.
	d2	Acquire self-and long life-learning.
	d3	Write scientific report
	d4	Think independently, solve problems on scientific basis.
	d5	Work in a team to conduct an experiment in physics lab.
4-Contents	1	The Nature of Light
	2	Reflection and Refraction of light
	3	Huygens' Principle and its Applications



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	4	Images Formed by mirrors and lenses		
	5	The electric force and the electric field		
	6	Gauss’s Law		
	7	Electric potential		
	8	Direct Current Circuits and its components		
5- Teaching and learning method				
6- Teaching and learning methods for students with limited capacity		Not Availiable.		
7-Student Assessment Methods				
a-Using Assessment	1	Final written		
	2	Practical exam		
	3	Oral exam		
	4	Mid- term exam		
b-Assessment Schedule	1	Final written	15	
	2	Practical exam	13	
	3	Oral exam	13	
	4	Mid- term exam	8	
c-Weighting of Assessments	1	Final written	5	10.00%
	2	Practical exam	10	20.00%
	3	Oral exam	2.5	5.00%
	4	Mid- term exam	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	N. Subrahmanyam, B. Lal, "A textbook of optics", S. Chand, New Delhi, 2003.		
	2	R. A. Serway, J. W. Jewett, "Physics for scientists and engineers", Thomson, 2004.		



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c-Suggested Books	1	E. Hecht, "Optics", Pearson Eduction, New Delhi, 2002.
	2	D. Halliday, R. Resnick and J. Walker" Fundamentals of Physics", fifth Ed., John Wiley & Sons, New York, 1997.
d-Scientific periodicals or Publications	1	Library

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	The Nature of Light	1	a1	b1	c1,c2	d1 , d2 , d3 ,d4
2	Reflection and Refraction of light	2,3	a2 ,	b1 , b2 ,	c1 ,c2	d1 , d2 , d3 , d4 ,
3	Huygens' Principle and its Applications	4, 5	a3 ,	b1 ,	c1,c2	d1 , d2 , d3 , d4 ,
4	Images Formed by mirrors and lenses	6, 7	a4 , a5 ,	b3 , b4 ,	c1,c2	d1 , d2 , d3 , d4 , d5 ,
5	The electric force and the electric field	8, 9	a6 , a7 ,	b5 , b6 , b7 , b8	c3 , c4 ,	d1 , d2 , d3 , d4 , d5 ,
6	Gauss's Law	10, 11	a8 ,	b8	c3 , c4	d1 , d2 , d3 , d4 , d5 ,
7	Electric potential	12	a7 ,	b6 , b7	c3,c4,c5	d1 , d2 , d3 , d4 , d5 ,
8	Direct Current Circuits and its components	13, 14	a9 ,	b7 , b8 , b9	c3,c4,c5	d1 , d2 , d3 , d4 , d5 ,

Course Coordinator Prof. Dr. **Tarik Ahmed Mohamed ElSayed Eaid+Gomaa Mahmoud Abd El-hameed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Introductory Computer Science**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Physics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	UP131	Title	Introductory Computer Science		Level	1	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	The course aims to introduce students to the basic concepts of the computer, Computer hardware, numerical systems, different ways to represent the data inside the computer, circuits and logic gates, the use of flowcharts and pseudo code for algorithms' representation. Computer software, Internet and computer networks.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Know the fundamental concepts of computer hardware and software components
	a2	Recognize and appreciate the professional and ethical responsibilities of the practicing computer professional including understanding the need for quality.
	a3	Identify information technology tools used to access information
	a4	Define different components of computer and how they works



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Work with and model computer systems at different and appropriate levels of abstraction
	b2	Critically evaluate the quality of a given software system, applying theories and methods of software validation and verification.
	b3	Create and share document that support day-to-day office businesses
	b4	Demonstrate the use of variety of software and appropriate information technology tools to solve problems
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Design, write and debug computer programs in appropriate languages
	c2	Appreciate the features of computing hardware and software and operate them effectively
	c3	Use appropriate computer-based design support tools
d-General and transferable skills: At the end of the course the student should be able to:	d1	Use IT skills and display mature computer literacy.
	d2	Work effectively with and for others
	d3	Strike the balance between self-reliance and seeking help when necessary in new situations.
	d4	Display personal responsibility by working to multiple deadlines in complex activities
	d5	Demonstrate significantly enhanced group working abilities
4-Contents	1	Computers, concepts and terminologies
	2	Computer hardware
	3	Numerical systems1
	4	Numerical systems2
	5	Numerical systems3
	6	Data representation methods inside the computer1
	7	Data representation methods inside the computer2
	8	Logical gates and truth tables 1
	9	Logical gates and truth tables 2
	10	Flowcharts & pseudo code1
	11	Flowcharts & pseudo code2



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	12	Computer software	
	13	Introduction to computer communications and Internet	
5- Teaching and learning method	1	Information Collection	✓
	2	Research Assignment	✓
	3	Lecture (Data show, laptop computer)	✓
	4	Lab Activities (lab equipments. Apparatus, and kits)	✓
	5	Case Study	✓
6- Teaching and learning methods for students with limited capacity		Not Availiable.	
7-Student Assessment Methods			
a-Using Assessment	FSFU DB		
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes			
b-Essential Books(text books)	1	There are lectures notes prepared in the form of a book authorized by the department	
c-Suggested Books			
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Computers, concepts and terminologies	1	a1	b1	c1	d1
2	Computer hardware	2	a1	b1-b2	c1	d1
3	Numerical systems1	3	a1-a2	b2	c1-c2	d1-d2
4	Numerical systems2	4	a2	b2	c1-c2	d2
5	Numerical systems3	5	a2	b2	c1-c2	d2
6	Data representation methods inside the computer1	6	a2	b2-b3	c2	d2-d3
7	Data representation methods inside the computer2	7	a2, a3	b3	c2	d3
8	Logical gates and truth tables 1	8	a3	b3	c2-c3	d3-d4
9	Logical gates and truth tables 2	9	a3	b3-b4	c2-c3	d3-d4
10	Flowcharts & pseudo code1	10	a3	b3-b4	c2-c3	d4
11	Flowcharts & pseudo code2	11	a3, a4	b4	c3	d4
12	Computer software	12	a4	b4	c3	d5
13	Introduction to computer communications and Internet	13	a4	b4	c3	d5

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



SECOND LEVEL

FIRST SEMESTER



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Course Specification For **Genetics and Molecular Biology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z261	Title	Genetics and Molecular Biology			Level	2	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Acquire the basic concepts of the molecular biology and biotechnology
2	Acquire the basic skills of safety maintenances of transplanted cells
3	Acquire the students the basic skills of genetic engineering and its role

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	define the basic concepts of biotechnology and tissues transplantation.
	a2	recognize the basic requirements of genetic engineering and its role.
	a3	understand the routs by which biotechnology affected and effected the social and environmental surrounding conditions
	a4	define the basic concepts of biotechnology and tissues transplantation



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b- Intellectual skills: At the end of the course the student should be able to:	b1	distinguish different types of cells	
	b2	propose suitable routs by which biotechnology affected and effect the cell	
	b3	analyze different types of genetic engineering and its role in modulation of favorite new animal generation.	
c-Professional and practical skills: At the end of the course the student should be able to:			
d-General and transferable skills: At the end of the course the student should be able to:	d1	work effectively both in a team, and independently on solving problems.	
	d2	use IT and search for information.	
	d3	communicate effectively with his teacher and colleagues.	
4-Contents	1	Introduction and basic concepts.	
	2	Formation of gene colony-genetic modulation of microbes, for plants and animals	
	3	Routes by which biotechnology affected and affected the social and environmental surrounding conditions.	
	4	Application of different types of cell.	
	5	Genetic engineering and its role.	
	6	Some specialized experimental techniques	
	7	Revision	
5- Teaching and learning method	1	class lectures using board	✓
	2	electronic learning using computer	✓
	3	data show system and inter net	✓
6- Teaching and learning methods for students with limited capacity		Not Availiable.	
7-Student Assessment Methods			
a-Using Assessment	1	Mid-Term Examination	
	2	Final-Term Examination	
	3	Oral Examination	



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	4	Semester work		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	10	
	4	Semester work		
c-Weighting of Assessments	1	Mid-Term Examination	10	20.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Semester work	2.5	5.00%
8-List of References				
a-Course notes	1	The E- learning course		
b-Essential Books(text books)	1	Biotechnology for Beginners		
	2	A textbook of biochemistry		
	3	Biotechnology science for the new millennium		
	4	An introduction to chemoinformatics		
	5	A textbook of medical biochemistry		
c-Suggested Books	1	Biochemistry		
	2	Bioinformatics: sequence alignment and Markov models		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction and basic concepts.	1	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,		d1 , d2 , d3 ,



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2	Formation of gene colony-genetic modulation of microbes, for plants and animals	2,3	a2 , a3 , a4 ,			d1 , d2 , d3 ,
3	Routes by which biotechnology affected and affected the social and environmental surrounding conditions.	4,5	a2 , a3 , a4 ,			d1 , d2 , d3 ,
4	Application of different types of cell.	6,7	a3 , a4 ,			d1 , d2 , d3 ,
5	Genetic engineering and its role.	8-10	a2 , a3 , a4 ,			d1 , d2 , d3 ,
6	Some specialized experimental techniques	11-13				d1 , d2 , d3 ,
7	Revision	14				

Course Coordinator Prof. Dr. Mohamed Wasim Mohamed Khalil

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Invertebrate**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z231	Title	Invertebrate			Level	2	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	The overall aims of the study of this course is: •By the end of this course the students will be able to demonstrate knowledge of the general morphological characters of insect, the fundamental structure-function of insect body regions and the different types of insect development and metamorphosis.
2	* Introducing the principles of: Invertebrate Zoology. -the classification of Invertebrate Zoology. •Recognizing Illustrate the structures of examples from different families .

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Enumerate the general morphological characters of phylum Arthropoda and class Insecta .
	a2	Give an account of the general structure and function of the integument
	a3	Describe the main regions of the insect body.
	a4	Illustrate the generalized type of insect mouth parts, antennae, legs, wings, abdominal appendage and the different modification in different insects.
	a5	Give an account of the stages of insect development and the different types of metamorphosis, larvae and pupae.



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	<table> <tr> <td>a6</td><td>define general classification of : Invertebrate Zoology</td></tr> <tr> <td>a7</td><td>explain different types of life cycles.</td></tr> <tr> <td>a8</td><td>mention structure details of different Invertebrate Zoology</td></tr> <tr> <td>a9</td><td>list the economical importance of invertebrate</td></tr> </table>	a6	define general classification of : Invertebrate Zoology	a7	explain different types of life cycles.	a8	mention structure details of different Invertebrate Zoology	a9	list the economical importance of invertebrate		
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a8	mention structure details of different Invertebrate Zoology										
a9	list the economical importance of invertebrate										
b- Intellectual skills: At the end of the course the student should be able to:	<table> <tr> <td>b1</td><td>Integrate structural and fundamental concepts in explaining the characteristics of insect life and the reasons for success of insects as a group.</td></tr> <tr> <td>b2</td><td>Apply the information gained from the examination of different shapes and modification of head, thoracic, and abdominal appendages to identify the habitat of any insect in the field which are not included in the formal teaching of this course .</td></tr> <tr> <td>b3</td><td>link general systematic of different invertebrate groups.</td></tr> <tr> <td>b4</td><td>compare between different genera of invertebrates.</td></tr> </table>	b1	Integrate structural and fundamental concepts in explaining the characteristics of insect life and the reasons for success of insects as a group.	b2	Apply the information gained from the examination of different shapes and modification of head, thoracic, and abdominal appendages to identify the habitat of any insect in the field which are not included in the formal teaching of this course .	b3	link general systematic of different invertebrate groups.	b4	compare between different genera of invertebrates.		
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b3	link general systematic of different invertebrate groups.										
b4	compare between different genera of invertebrates.										
c-Professional and practical skills: At the end of the course the student should be able to:	<table> <tr> <td>c1</td><td>Handle fresh specimens of insects to identify and illustrate the insect body regions.</td></tr> <tr> <td>c2</td><td>Use the optical microscope to examine and identify the differences between the different types of head, thoracic, and abdominal appendages and their modifications.</td></tr> </table>	c1	Handle fresh specimens of insects to identify and illustrate the insect body regions.	c2	Use the optical microscope to examine and identify the differences between the different types of head, thoracic, and abdominal appendages and their modifications.						
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c2	Use the optical microscope to examine and identify the differences between the different types of head, thoracic, and abdominal appendages and their modifications.										
d-General and transferable skills: At the end of the course the student should be able to:	<table> <tr> <td>d1</td><td>Write a report with the standard scientific guidelines .</td></tr> <tr> <td>d2</td><td>Use appropriate computer program, packages and download on line data .</td></tr> <tr> <td>d3</td><td>Present reports in seminars, workshops or group meeting .</td></tr> <tr> <td>d4</td><td>Work coherently and successfully as a part of a team in project</td></tr> <tr> <td>d5</td><td>Study and find information independently</td></tr> </table>	d1	Write a report with the standard scientific guidelines .	d2	Use appropriate computer program, packages and download on line data .	d3	Present reports in seminars, workshops or group meeting .	d4	Work coherently and successfully as a part of a team in project	d5	Study and find information independently
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d3	Present reports in seminars, workshops or group meeting .										
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d5	Study and find information independently										
4-Contents	<table> <tr> <td>1</td><td>General morphological character of phylum Arthropoda and class Insecta - Introduction and general -classification invertebrates</td></tr> <tr> <td>2</td><td>The integument: structure, function, processes and appendages - General classification and structure of Arthropoda</td></tr> <tr> <td>3</td><td>Structure of body regions: Head: origin, position relative to body, sclerites Structure studies of different systems of Penaeus japonicus</td></tr> <tr> <td>4</td><td>Antennae and their modifications Structure studies of different systems of Penaeus japonicu</td></tr> </table>	1	General morphological character of phylum Arthropoda and class Insecta - Introduction and general -classification invertebrates	2	The integument: structure, function, processes and appendages - General classification and structure of Arthropoda	3	Structure of body regions: Head: origin, position relative to body, sclerites Structure studies of different systems of Penaeus japonicus	4	Antennae and their modifications Structure studies of different systems of Penaeus japonicu		
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	5	Mouth parts (generalized type & modifications)- feeding mechanism. Structure studies of different larvae of <i>Penaeus japonicus</i>	
	6	Mouth parts (generalized type & modifications)- feeding mechanism. General characters and structure studies of different systems of Malacostraca and Branchioida	
	7	Thorax: structure, wing (articulation-types-venation- movement). General characters and structure studies of different systems of Ostracoda, Cirripedia and Copepoda	
	8	Legs (structure- articulation- modifications - movement). - General characters and structure studies of different systems of Chilopoda and compare between it and Diplopoda	
	9	.Abdomen: structure, appendages not associated with reproduction. General characters and structure studies of different species of class (Chelicerata) Arachnoidea order Arachnida(,Scorpionidea,Araneida, and Acarina)	
	10	Male and female genitalia and modified ovipositor - General characters and structure studies of different species of Mollusca (Polyplacophora and Lamellibranchiata	
	11	development.metamorphosis: The egg: hatching, post-embryonic development - General characters and structure studies of different species of Mollusca Gastropoda and Cephalopoda).	
	12	Types of metamorphosis, General characters and structure studies of different species Echinodermata (Astrozoa and Echinozoa)	
	13	Types of larvae& pupae and emergence from cocoon – General characters and structure studies of different species (Holothurozoa and crinozoa). Echinozoa).	
	14	Review and feedback activities - Revision	
5- Teaching and learning method	1	lecture to develop the knowledge and understand	✓
	2	Discussion to initiate critical thinking and to let the students know how to work in team	✓
	3	Practical to develop both practical &professional skills .	✓



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-Term Examination	55	73.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	prepared by the course instructor		
b-Essential Books(text books)	1	Hickman, C. P. Jr; Roberts, L. S. ; Larson , A.; l'Anson,H. ; Eisenhour, D. J. (2006) Integrated Principles of Zoology 13th edition.		
	2	The McGraw-Hill companies: Boston Chapman, R.F. (2002): The Insects: structure and Function. UK: Cambridge University Press.		
c-Suggested Books	1	Fundamentals of Entomology.Richard J.Elzinga.		
	2	The world of insects Chinery,Michael		
d-Scientific periodicals or Publications	1	Applaid Entomology . www.ucmp.berkeley.edu/help/taxaform.html		
	2	www.mbl.edu		
	3	www.Mhhe.Com/Zoology		



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Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	General morphological character of phylum Arthropoda and class Insecta - Introduction and general -classification invertebrates	1	a1 , a3 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5
2	The integument: structure, function, processes and appendages - General classification and structure of Arthropoda	2	a1 , a3 , a6 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5
3	Structure of body regions: Head: origin, position relative to body, sclerites Structure studies of different systems of Penaeus japonicus	3	a1 , a3 , a4 , a6 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5
4	Antennae and their modifications Structure studies of different systems of Penaeus japonicu	4	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
5	Mouth parts (generalized type & modifications)-feeding mechanism. Structure studies of different larvae of Penaeus japonicus	5	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
6	Mouth parts (generalized type & modifications)-feeding mechanism. General characters and structure studies of different systems of Malacostraca and Branchioida	6	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,



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7	Thorax: structure, wing (articulation-types-venation-movement). General characters and structure studies of different systems of Ostracoda, Cirripedia and Copepoda	7	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
8	Legs (structure- articulation-modifications - movement). - General characters and structure studies of different systems of Chilopoda and compare between it and Diplopoda	8	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
9	.Abdomen: structure, appendages not associated with reproduction. General characters and structure studies of different species of class (Chelicerata) Arachnoidea order Arachnida(,Scorpionidea,Ar aneida, and Acarina)	9	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
10	Male and female genitalia and modified ovipositor - General characters and structure studies of different species of Mollusca (Polyplacophora and Lamellibranchiata	10	a1 , a3 , a4 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
11	development.metamorphosis : The egg: hatching, post-embryonic development - General characters and structure studies of different species of Mollusca Gastropoda and Cephalopoda).	11	a1 , a3 , a5 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,



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12	Types of metamorphosis, General characters and structure studies of different species Echinodermata (Astrozoa and Echinozoa)	12	a1 , a3 , a5 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
13	Types of larvae& pupae and emergence from cocoon – General characters and structure studies of different species (Holothurozoa and crinozoa). Echinozoa).	13	a1 , a3 , a5 , a7 , a8 , a9 ,	b4 , b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
14	Review and feedback activities - Revision	14				

Course Coordinator Prof. Dr. Ragaa Taha Mohamed

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Principles of cytogenetics**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B281	Title	Principles of cytogenetics			Level	2	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course is designed to familiarize students with basic and modern concepts of plant genetics and its relevancy to the daily life as well as providing a base for further study in genetics and related disciplines.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a2	State the Mendelian basis of inheritance
	a3	Label chromosomes, chromosomal changes and its role in genetics
b- Intellectual skills: At the end of the course the student should be able to:	b1	analyse plant genetics
	a1	recall plant genetics
	b2	correlate the Mendelian basis of inheritance
	b3	Diagnose chromosomes, chromosomal changes and its role in genetics



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Employ statistical analyses and computational tools to analyze and interpret experimental data in terms of theories relevant to genetics	
d-General and transferable skills: At the end of the course the student should be able to:	d2	Think independently, set tasks and solve problems on scientific basis.	
4-Contents	1	Mendelian Inheritance: Monohybrid Cross - Dihybrid cross - Test cross	
	2	Chrosomal bases of inheritance: Chromosome structure - Chromosome behavior during cell division - Chromosomes and Mendelian inheritance - Linkage and crossing over	
	3	Chrosomal Changes: Changes in Chromosome morphology - Changes in Chromosome number	
	4	Practical and Oral Exam	
5- Teaching and learning method	1	Lectures	☐
	2	Discussion	☐
	3	Practical	☐
6- Teaching and learning methods for students with limited capacity			Not Avaliable.
7-Student Assessment Methods			
a-Using Assessment	1	1.Final written exam to assess Knowledge and understanding and Intellectual skills	
	2	2.Practical exam. to assess Professional skills	
	3	3.Oral exam to assess Knowledge and understanding, Intellectual, general and transferrable skills	



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	4	4.Mid- term exam, Student activities to assess Knowledge and understanding, intellectual skills		
b-Assessment Schedule	1	1.Final written exam to assess Knowledge and understanding and Intellectual skills	16	
	2	2.Practical exam. to assess Professional skills	15	
	3	3.Oral exam to assess Knowledge and understanding, Intellectual, general and transferrable skills	15	
	4	4.Mid- term exam, Student activities to assess Knowledge and understanding, intellectual skills	8	
c-Weighting of Assessments	1	1.Final written exam to assess Knowledge and understanding and Intellectual skills	35	70.00%
	2	2.Practical exam. to assess Professional skills	10	20.00%
	3	3.Oral exam to assess Knowledge and understanding, Intellectual, general and transferrable skills	2.5	5.00%
	4	4.Mid- term exam, Student activities to assess Knowledge and understanding, intellectual skills	2.5	5.00%



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8-List of References		
a-Course notes		
b-Essential Books(text books)	1	Weaver, R.F. 1995. Basic Genetics. WIM C. Brown Publishers
c-Suggested Books	1	Lewin, B. 1997. Genes VI. Oxford Univ. Press Inc. New York
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Mendelian Inheritance: Monohybrid Cross - Dihybrid cross - Test cross	1-4	a1 ,	b1 ,	c1 ,	d1,
2	Chrosomal bases of inheritance: Chromosome structure - Chromosome behavior during cell division - Chromosomes and Mendelian inheritance - Linkage and crossing over	5 - 9	a2 ,	b2 ,	c1 ,	d1,
3	Chrosomal Changes: Changes in Chromosome morphology - Changes in Chromosome number	10-13	a3 ,	b3 ,	c1 ,	d1 ,
4	Practical and Oral Exam	14				

Course Coordinator Prof. Dr. **Mohamed Anwar Karam**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**



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Course Specification For **Crop science and economic botany**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B232	Title	Crop science and economic botany	Level	2	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1

2- Overall aims of the course

1	This course is intended to deal with the economically important lower and higher plants, their products and its uses in food, drugs and industry. Besides, the course aims at studying the crops and agriculture in Egypt with reference to its history, origin, major categories, common practice in agriculture, and common problems and their solving.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recall Structure and classification of field crops
	a2	List crop growth and distribution with changing environments, Arable weeds and their control, Crop distribution and rotation in Egypt
	a3	Enumerate the importance of lower and higher plants to man, positive role of microorganisms in foods, medicine and Production of organic compounds
	a4	List uses of higher plants and medicinal plants



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>Define Structure and classification of field crops, crop growth and distribution with changing environments, Arable weeds and their control, Crop distribution and rotation in Egypt</td></tr> <tr> <td>b2</td><td>Discuss the importance of lower and higher plants to man, positive role of microorganisms in foods, medicine and Production of organic compounds</td></tr> <tr> <td>b3</td><td>Classify uses of higher plants and medicinal plants</td></tr> </table>	b1	Define Structure and classification of field crops, crop growth and distribution with changing environments, Arable weeds and their control, Crop distribution and rotation in Egypt	b2	Discuss the importance of lower and higher plants to man, positive role of microorganisms in foods, medicine and Production of organic compounds	b3	Classify uses of higher plants and medicinal plants																						
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b2	Discuss the importance of lower and higher plants to man, positive role of microorganisms in foods, medicine and Production of organic compounds																												
b3	Classify uses of higher plants and medicinal plants																												
c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>Apply field and laboratory investigations of living systems in an ethical and responsible manner</td></tr> </table>	c1	Apply field and laboratory investigations of living systems in an ethical and responsible manner																										
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d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Consider community linked problems, ethics and traditions</td></tr> </table>	d1	Consider community linked problems, ethics and traditions																										
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4-Contents	<table border="1"> <tr><td>1</td><td>Structure and classification of field crops</td></tr> <tr><td>2</td><td>Environment in relation to crop growth and distribution</td></tr> <tr><td>3</td><td>Seed bed preparation</td></tr> <tr><td>4</td><td>Arable weeds and their control</td></tr> <tr><td>5</td><td>Crop improvement and seed production</td></tr> <tr><td>6</td><td>Crop rotation</td></tr> <tr><td>7</td><td>Crop distribution in Egypt</td></tr> <tr><td>8</td><td>The importance of lower and higher plants to man</td></tr> <tr><td>9</td><td>Positive role of microorganisms in foods, medicine and Production of organic compounds</td></tr> <tr><td>10</td><td>Economic uses of algae in medicine</td></tr> <tr><td>11</td><td>Fiber and wood plants,Dye plants</td></tr> <tr><td>12</td><td>Rubber, gum and resin plants</td></tr> <tr><td>13</td><td>Aromatic oil plants, Fatty oil and wax plants, Sugar, starch and cellulose plants</td></tr> <tr><td>14</td><td>Medicinal plants</td></tr> </table>	1	Structure and classification of field crops	2	Environment in relation to crop growth and distribution	3	Seed bed preparation	4	Arable weeds and their control	5	Crop improvement and seed production	6	Crop rotation	7	Crop distribution in Egypt	8	The importance of lower and higher plants to man	9	Positive role of microorganisms in foods, medicine and Production of organic compounds	10	Economic uses of algae in medicine	11	Fiber and wood plants,Dye plants	12	Rubber, gum and resin plants	13	Aromatic oil plants, Fatty oil and wax plants, Sugar, starch and cellulose plants	14	Medicinal plants
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	15	Revision and oral exam.		
5- Teaching and learning method	1	Lecture	☐	
	2	Discussion.	☐	
	3	Practical.	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid- term exam and student activity		
	2	Oral exam		
	3	Final-term Examination		
b-Assessment Schedule	1	Mid- term exam and student activity	8	
	2	Oral exam	14	
	3	Final-term Examination	15	
c-Weighting of Assessments	1	Mid- term exam and student activity	2.5	10.00%
	2	Oral exam	2.5	10.00%
	3	Final-term Examination	20	80.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Structure and classification of field crops	1	a1 ,			
2	Environment in relation to crop growth and distribution	2	a2 ,	b1 ,		
3	Seed bed preparation	3	a3 ,	b2 ,		d1 ,
4	Arable weeds and their control	4	a3 ,	b2 ,	c1 ,	
5	Crop improvement and seed production	5	a3 ,	b3 ,	c1 ,	
6	Crop rotation	6	a4 ,	b1 ,		d1 ,
7	Crop distribution in Egypt	7	a4 ,			
8	The importance of lower and higher plants to man	8	a1 ,	b3 ,	c1 ,	d1 ,
9	Positive role of microorganisms in foods, medicine and Production of organic compounds	9	a2 ,	b3 ,		d1 ,
10	Economic uses of algae in medicine	10	a3 ,			
11	Fiber and wood plants,Dye plants	11	a3 ,			
12	Rubber, gum and resin plants	12	a3 ,			
13	Aromatic oil plants, Fatty oil and wax plants, Sugar, starch and cellulose plants	13	a4 ,	b3 ,		
14	Medicinal plants	13				
15	Revision and oral exam.	14				

Course Coordinator Prof. Dr. **Medhat Abdel- Fatah**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**



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Course Specification For

Plant Ecology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B242	Title	Plant Ecology			Level	2	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: to familiarize students with different components of ecosystems and the impact of biotic and a biotic factors on plant communities regarding to the main energy transfer in the ecosystem in addition to the influence of human on the environment

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define plant ecology
	a2	List structure and components of ecosystems as well as energy flow, food web and ecological pyramids
	a3	Enumerate biogeochemical cycles and types and process of plant succession in addition to factors influencing the environment
	a4	Memorize influence of human on the environment
b- Intellectual skills: At the end of the course the student should be able to:	b1	Define plant ecology
	b2	Discuss structure and components of ecosystems as well as energy flow, food web and ecological pyramids
	b3	Classify biogeochemical cycles and types and process of plant succession and factors influencing the environment



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	b4	Discuss influence of human on the environment	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Consider variations inherent in dealing with biological materials such as sample size, accuracy, precision and calibration.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Employ scientific models, systems and tools effectively	
4-Contents	1	Definition of plant ecology	
	2	Structure of ecosystem	
	3	Energy flow: Source and the transfer	
	4	Energy flow: Food web	
	5	Energy flow: Ecological pyramids	
	6	Biogeochemical cycles: N, C, P cycles.	
	7	Biogeochemical cycles: water cycle.	
	8	Plant succession	
	9	Factors influencing environment and habitats	
	10	Influence of human on the environment	
	11	Practical and Oral Exam	
	12	Final Exam	
5- Teaching and learning method	1	Lecture	☐
	2	Discussion	☐
	3	Practical	☐



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid- term exam		
	2	Oral Examination		
	3	Practical Examination		
	4	Final-term Examination		
b-Assessment Schedule	1	Mid- term exam	8	
	2	Oral Examination	14	
	3	Practical Examination	14	
	4	Final-term Examination	15	
c-Weighting of Assessments	1	Mid- term exam	2.5	5.00%
	2	Oral Examination	2.5	5.00%
	3	Practical Examination	10	20.00%
	4	Final-term Examination	35	70.00%
8-List of References				
a-Course notes	1	By Department Stuff.		
b-Essential Books(text books)				
c-Suggested Books	1	Plant Ecology - MCDougall, W.B-online		
d-Scientific periodicals or Publications	1	fewfewfge		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Definition of plant ecology	1	a1 ,	b2 ,		



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2	Structure of ecosystem	2, 3	a2 ,	b2 ,		
3	Energy flow: Source and the transfer	4	a2 ,	b2 ,		
4	Energy flow: Food web	5	a2 ,	b2 ,	c1 ,	
5	Energy flow: Ecological pyramids	6	a2 ,	b2 ,		d1 ,
6	Biogeochemical cycles: N, C, P cycles.	7	a3 ,	b3 ,		
7	Biogeochemical cycles: water cycle.	8	a3 ,	b3 ,		
8	Plant succession	9, 10	a3 ,	b3 ,	c1 ,	
9	Factors influencing environment and habitats	11, 12	a3 ,	b3 ,		d1 ,
10	Influence of human on the environment	13	a4 ,	b4 ,	c1 ,	
11	Practical and Oral Exam	14				
12	Final Exam	15				

Course Coordinator Prof. Dr. **Mai Sayed Fouad**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Organic chemistry (bifunctional group compounds+proteins+ fats)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C221	Title	Organic chemistry (bifunctional group compounds+proteins+ fats)	Level	2	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3

2- Overall aims of the course

1	Understand the basic principles of nomenclature of bifunctional group compounds .
2	study the preparation and reactions of bifunctional group compounds such as diolefines, dicarboxylic acids.
3	Know the chemistry of active methylene compounds and their synthetic applications.
4	To familiarize the students with the structure of fats and proteins and their properties.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Identify the different bifunctional group compounds
	a2	Understand some difference in behaviour between monofunctional and bifunctional group compounds.
	a3	Explain the reactivity of some interesting bifunctional group compounds and their physical properties.
	a4	Evaluate the synthetic applications of active methylene compounds.
	a5	Know the different types of structure of proteins and their



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		chemistry.
	a6	Explain the structure of fats, their properties and chemical reactions.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Conclude information in both lectures and library from some exercises to apply the studied topics in course .
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Identify fats and proteins.
	c2	Synthesis of some bifunctional group compounds and some other derived compounds
	c3	Differentiate between different bifunctional group compounds.
	c4	Know different methods for synthesis of peptides from amino acids.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Present independent investigative skills by using textbooks and other sources (Internet, Library,...)
	d2	Work in a team
	d3	Write report
4-Contents	1	Introduction to synthesis and reactions of bifunctional group compounds
	2	Synthesis and reaction of active methylene compounds. The synthetic application of active methylene compounds.
	3	Diolefine compounds-synthesis and reactions
	4	The unsaturated carbonyl compounds, synthesis and reactions and abnormal behaviour.
	5	Dicarboxylic acids and their derivatives, nomenclature, synthesis and their chemical reactions.
	6	Dialdehydes and diketones: nomenclature, preparation and reactions.
	7	Fatty acids- classification of fats-synthesis of fats and their reactions.
	8	Amino acids, classification, synthesis and reactions. Types of proteins- synthesis of proteins chemical reactions
	9	Revision



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5- Teaching and learning method	1	lecture	☐	
	2	Open Discussion	☐	
	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Practical exam		
	3	Sheet (oral or written)		
	4	Mid- term exam		
b-Assessment Schedule	1	Final written exam	15	
	2	Practical exam	14	
	3	Sheet (oral or written)	14	
	4	Mid- term exam	8	
c-Weighting of Assessments	1	Final written exam	55	73.33%
	2	Practical exam	15	20.00%
	3	Sheet (oral or written)	2.5	3.33%
	4	Mid- term exam	2.5	3.33%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part		
b-Essential Books(text books)	1	Basic principles of organic chemistry - Finar volume 1 (1985- Longman) - Mareson and Boyer, 1983, Alyn and Bacon. Inc		
c-Suggested Books				
d-Scientific periodicals or Publications				



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Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction to synthesis and reactions of bifunctional group compounds	1	a1 ,		c1 ,	d1 , d3 ,
2	Synthesis and reaction of active methylene compounds. The synthetic application of active methylene compounds.	2,3	a3 , a4 ,	b1 ,	c3 ,	d1 , d2 , d3 ,
3	Diolefine compounds- synthesis and reactions	4,5	a1 , a2 , a3 ,	b1 ,	c2 ,	d1 , d2 , d3 ,
4	The unsaturated carbonyl compounds, synthesis and reactions and abnormal behaviour.	5,6	a1 , a2 , a3 ,	b1 ,	c2 ,	d1 , d2 , d3 ,
5	Dicarboxylic acids and their derivatives, nomenclature, synthesis and their chemical reactions.	7,8	a1 , a2 , a3 ,	b1 ,	c2 ,	d1 , d2 , d3 ,
6	Dialdehydes and diketones: nomenclature, preparation and reactions.	9,10	a1 , a2 ,	b1 ,	c2 ,	d1 , d2 , d3 ,
7	Fatty acids- classification of fats-synthesis of fats and their reactions.	11,12		b1 ,	c1 ,	d1 , d2 , d3 ,
8	Amino acids, classification, synthesis and reactions. Types of proteins- synthesis of proteins chemical reactions	12,13	a5 ,	b1 ,	c1 , c4 ,	d1 , d2 , d3 ,
9	Revision	14	a1 , a2 , a3 , a4 , a5 , a6 ,	b1 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr.



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Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

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Course Specification For **Physical Chemistry & Thermodynamic (2)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C244	Title	Physical Chemistry & Thermodynamic (2)			Level	2	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	Understand the basic concepts of thermodynamics .
2	study the laws of thermodynamics and its examples
3	Know the forms of the energy
4	study the properties of the system oat equilibrium

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Compare between the energy forms .
	a2	Explain the thermo chemical equation and calculate the heat of reactions .
	a3	Differentiate between isothermal and adiabatic reversible expansion processes .
	a4	Evaluate the efficiency of machine.
	a5	Define the entropy and free energy .
	a6	Mention the relation between free energy and equilibrium constant .



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b- Intellectual skills: At the end of the course the student should be able to:	<table><tr><td>b1</td><td>Conclude information in both lectures and library from some exercises to apply the studied laws in course .</td></tr></table>		b1	Conclude information in both lectures and library from some exercises to apply the studied laws in course .														
b1	Conclude information in both lectures and library from some exercises to apply the studied laws in course .																	
c-Professional and practical skills: At the end of the course the student should be able to:	<table><tr><td>c1</td><td>Measure the efficiency of machine .</td></tr><tr><td>c2</td><td>calculate the heat of reaction .</td></tr><tr><td>c3</td><td>Compare between isothermal and adiabatic processes.</td></tr></table>		c1	Measure the efficiency of machine .	c2	calculate the heat of reaction .	c3	Compare between isothermal and adiabatic processes.										
c1	Measure the efficiency of machine .																	
c2	calculate the heat of reaction .																	
c3	Compare between isothermal and adiabatic processes.																	
d-General and transferable skills: At the end of the course the student should be able to:	<table><tr><td>d1</td><td>Discuss the different problems related to thermodynamic variables.</td></tr><tr><td>d2</td><td>Locate if the system of process in equilibrium state or not</td></tr><tr><td>d3</td><td>Write report</td></tr></table>		d1	Discuss the different problems related to thermodynamic variables.	d2	Locate if the system of process in equilibrium state or not	d3	Write report										
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4-Contents	<table><tr><td>1</td><td>Thermodynamics Introduction basic concepts</td></tr><tr><td>2</td><td>Thermodynamics .1st law of thermodynamics and maximum work .- Heat of reaction , thermo chemical equations and calculate of</td></tr><tr><td>3</td><td>Thermodynamics Hess's law , heat of for motion , heat of combustion and heat capacities , Kirchoff's equations</td></tr><tr><td>4</td><td>Thermodynamics .Application of the first law of thermo dynamics , isothermal and adiabatic reversible expansion and the work done . Exercises</td></tr><tr><td>5</td><td>Thermodynamics - 2nd law of thermodynamics , spontaneous processes , entropy and statement of the third law</td></tr><tr><td>7</td><td>Thermodynamics Heat engine , Car not cycle and efficiency of machine . Examples</td></tr><tr><td>8</td><td>Thermodynamics . Entropy change in reversible and irreversible processes ,examples</td></tr><tr><td>9</td><td>Thermodynamics Gibbs free energy and equilibrium constant, Dependence of equilibrium constant on temperature and effect of temperature on solubility . examples and exercises</td></tr></table>		1	Thermodynamics Introduction basic concepts	2	Thermodynamics .1st law of thermodynamics and maximum work .- Heat of reaction , thermo chemical equations and calculate of	3	Thermodynamics Hess's law , heat of for motion , heat of combustion and heat capacities , Kirchoff's equations	4	Thermodynamics .Application of the first law of thermo dynamics , isothermal and adiabatic reversible expansion and the work done . Exercises	5	Thermodynamics - 2nd law of thermodynamics , spontaneous processes , entropy and statement of the third law	7	Thermodynamics Heat engine , Car not cycle and efficiency of machine . Examples	8	Thermodynamics . Entropy change in reversible and irreversible processes ,examples	9	Thermodynamics Gibbs free energy and equilibrium constant, Dependence of equilibrium constant on temperature and effect of temperature on solubility . examples and exercises
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5- Teaching and learning method	<table><tr><td>1</td><td>lecture</td><td>☐</td></tr><tr><td>2</td><td>Open Discussion</td><td>☐</td></tr><tr><td>3</td><td>Scientific Visits</td><td>☐</td></tr></table>		1	lecture	☐	2	Open Discussion	☐	3	Scientific Visits	☐							
1	lecture	☐																
2	Open Discussion	☐																
3	Scientific Visits	☐																



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6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Practical exam		
	3	Mid-Term Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Final written exam	15	
	2	Practical exam	14	
	3	Mid-Term Examination	8	
	4	Oral Examination	10	
c-Weighting of Assessments	1	Final written exam	55	73.33%
	2	Practical exam	15	20.00%
	3	Mid-Term Examination	2.5	3.33%
	4	Oral Examination	2.5	3.33%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part		
b-Essential Books(text books)	1	Physical Chemistry, Gordon. M Barrow 6th Edition		
	2	Electrochemistry, Carl H. Hamann, Andrew Humnett and wolf Vielstich.		
	3	Essential physical chemistry , B.S. Bahl, G.D. Tnli, Arun Bahl, S.CHAND's seal of trust, 1996 .		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Thermodynamics Introduction basic concepts	1	a1 ,		c1 ,	d1 , d3 ,
2	Thermodynamics .1st law of thermodynamics and maximum work .-Heat of reaction , thermo chemical equations and calculate of	2	a3 ,		c3 ,	d1 ,
3	Thermodynamics Hess's law , heat of for motion , heat of combustion and heat capacities , Kirchoff's equations	3	a3 ,			
4	Thermodynamics .Application of the first law of thermo dynamics , isothermal and adiabatic reversible expansion and the work done . Exercises	4	a4 ,		c2 ,	
5	Thermodynamics - 2nd law of thermodynamics , spontaneous processes , entropy and statement of the third law	5, 6	a5 ,	b1 ,		d1 ,
7	Thermodynamics Heat engine , Car not cycle and efficiency of machine . Examples	7, 8	a5 ,		c3 ,	
8	Thermodynamics . Entropy change in reversible and irreversible processes ,examples	9	a6 ,			



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9	Thermodynamics Gibbs free energy and equilibrium constant, Dependence of equilibrium constant on temperature and effect of temperature on solubility . examples and exercises	10, 11	a6 ,			

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Biophysics and Radiation**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Physics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	P243	Title	Biophysics and Radiation		Level	2	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	3	

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge of the basic concepts of radiation and biophysics cooperate between physics and biology and lead the student to understand the basic concepts of the radiation in medicine.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	describe the basic concepts of human body physics
	a2	describe the basic concepts of radiation
	a3	explain the role of external and internal hazards of radiation sources and radiation protection
b- Intellectual skills: At the end of the course the student should be able to:	b1	Apply and assimilate new information and address many kinds of problems using scientific methodology
	b2	Apply theories , rules and basic Sciences to interpret information
c-Professional and practical skills: At the end of the course the student should be able to:	c1	self learning
	c2	preserve practical skills of observation and data analysis
	c3	diagnose experimental results and determine their strength and validity



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d-General and transferable skills: At the end of the course the student should be able to:	d1	write and present reports
	d2	Acquire practical skills of Experimentation, observation and data analysis.
	d3	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)
	d4	Utilize problem solving skills in a variety of theoretical and practical situations.
4-Contents	1	Elementary potential of nerves. Elementary signal from muscles. Elementary signal from heart, brain and eye.
	2	Production of x-ray beams, how x-rays absorbed
	3	Making an x- ray image.
	4	Radiation in medicine review of basic characteristics of and the units of radioactivity.
	5	Sources of radio activity of nuclear medicine
	6	Basic instrumentation and its clinical application.: ☐ Scintillation screen- ☐ Geiger Mueller counter - ☐ Photomultiplier tube
	7	Nuclear medicine devices: ☐ Rectilinear ☐ Gamma camera
	8	adiation doses in nuclear medicine
	9	Radiation protection in medicine: ☐ Background radiation. ☐ biological effects of ionizing .
	10	Radiation protection units and limits. - Radiation protection in radiation therapy and in nuclear medicine.
	11	Heat therapy: Conductive method- radiant infrared method-radio wave heating - microwave diathermy-ultrasonic waves.
	12	of cold in medicine: ☐ Cryogenics and preservation of tissues. ☐ Blood preservation organs banks. ☐ Cryosurgery.
	13	review
5- Teaching and learning method	1	lecture ☐
	2	Discussion ☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written		
	2	Practical exam		
	3	Mid- term exam		
b-Assessment Schedule	1	Final written	15	
	2	Practical exam	13	
	3	Mid- term exam	8	
c-Weighting of Assessments	1	Final written	45	60.00%
	2	Practical exam	2.5	3.33%
	3	Mid- term exam	2.5	3.33%
8-List of References				
a-Course notes	1	Biophysics for first year students, Biophysics department-faculty of Science – Cairo University .		
	2	ا.د/ أحمد فؤاد باشا ، فيزياء حيوية ، دار الفكر العربى		
b-Essential Books(text books)	1	Physics for Radiation Protection ,(A.Hand book) ,2nd edition , James E. Marten (2006) – VCH(U.S.A).		
c-Suggested Books	1	Physics for Medical Imaging, R. Farr and P.J.Allisy-Roberts(2006) , India.		
d-Scientific periodicals or Publications	1	Periodicals, Web sites		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Elementary potential of nerves. Elementary signal from muscles. Elementary	1,2	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,



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	signal from heart, brain and eye.					
2	Production of x-ray beams, how x-rays absorbed	3	a1 , a2 , a3 ,	b1 , b2 ,		d1 , d2 , d3 , d4 ,
3	Making an x- ray image.	4		b1 , b2 ,	c1 , c2 , c3 ,	
4	Radiation in medicine review of basic characteristics of and the units of radioactivity.	5	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
5	Sources of radio activity of nuclear medicine	6	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
6	Basic instrumentation and its clinical application.: ☐ Scintillation screen- ☐ Geiger Mueller counter - ☐ Photomultiplier tube	7	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
7	Nuclear medicine devices: ☐ Rectilinear ☐ Gamma camera	8	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
8	adiation doses in nuclear medicine	9	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
9	Radiation protection in medicine: ☐ Background radiation. ☐ biological effects of ionizing .	10	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
10	Radiation protection units and limits. - Radiation protection in radiation therapy and in nuclear medicine.	11	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
11	Heat therapy: Conductive method- radiant infrared method-radio wave heating - microwave diathermy-ultrasonic waves.	12	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,



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12	of cold in medicine: ☐ Cryogenics and preservation of tissues. ☐ Blood preservation organs banks. ☐ Cryosurgery.	13	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
13	review	14	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr. **Gamal Atia Ali**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Introduction to law**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	General
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	UP121	Title	Introduction to law			Level	2	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	تقديم بعض المبادئ الأساسية للقانون
2	تقديم المعلومات الأساسية حول الحقوق الاجتماعية والاقتصادية
3	اكتساب الطلاب حق العدالة.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:

a1	شرح المبادئ الأساسية للقانون
a2	تعريف الحق وتقسيمات الحقوق
a3	تعرف آليات حماية حقوق الإنسان.
a4	تحديد الأشخاص الطبيعيين والاعتباريين
a5	تحديد محل الحق



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b- Intellectual skills: At the end of the course the student should be able to:	b1	التمييز بين النواع الحق	
	b2	تطبيق خصائص الشخصية على حالات محددة	
	b3	تطبيق محل الحق على حالات محددة	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	تطبيق تقنيات وأدوات القانون في الأخلاقيات العلمية.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	العمل على نحو فعال بشكل فردي أو كجزء من فريق	
	d2	تحليل وإيجاد حلول فعالة للمشاكل.	
	d3	التعامل مع براءات الاختراع العلمية طبقا لحقوق الملكية	
	d4	الارتباط باخلاقيات المجتمع ومشاكله وتقاليده.	
4-Contents	1	تعريف الحق وتقسيمات الحقوق: الحقوق الغير المالية	
	2	تعريف الحق وتقسيمات الحقوق: الحقوق المالية	
	3	اشخاص الحق ، الشخص الطبيعي: بداية الشخصية ونهايتها	
	4	أشخاص الحق ، الشخص الطبيعي: خصائص الشخصية	
	5	اشخاص الحق : ٢- الاشخاص الاعتباريين	
	6	محل الحق: الاشياء	
	7	محل الحق: الاعمال	
5- Teaching and learning method	1	Lecture	☐
	2	Discussion	☐
	3	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final written exam	
	2	Semester work	
	3	Oral Exam.	



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b-Assessment Schedule	1	Final written exam	15	
	2	Semester work	on all term	
	3	Oral Exam.	10	
c-Weighting of Assessments	1	Final written exam	45	90.00%
	2	Semester work	2.5	5.00%
	3	Oral Exam.	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	أ.د. جمال عبدالرحمن محمد، الوجيز في المدخل لدراسة القانون، الكتاب الثاني نظرية الحق، دار النهضة العربية، بني سويف، ٢٠١٦		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	تعريف الحق وتقسيمات الحقوق: الحقوق الغير المالية	1-2	a1 , a2 , a3 ,	b1 ,	c1 ,	d1 , d2 , d3 , d4 ,
2	تعريف الحق وتقسيمات الحقوق: الحقوق المالية	3,4	a2 , a3 ,	b1 ,	c1 ,	d1 , d2 , d3 , d4 ,
3	اشخاص الحق ، الشخص الطبيعي: بداية الشخصية ونهايتها	5,6	a4 ,	b2 ,	c1 ,	d1 , d2 , d3 , d4 ,
4	أشخاص الحق ، الشخص الطبيعي: خصائص الشخصية	7-10	a4 ,	b2 ,	c1 ,	d1 , d2 , d3 , d4 ,
5	اشخاص الحق : ٢- الاشخاص الاعتباريين	11, 12	a4 ,	b2 ,	c1 ,	d1 , d2 , d3 , d4 ,
6	محل الحق: الاشياء	13	a5 ,	b3 ,	c1 ,	d1 , d2 , d3 , d4 ,



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7	محل الحق: الاعمال	14	a5 ,	b3 ,	c1 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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SECOND LEVEL

SECOND SEMESTER



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Course Specification For **Chordates**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z241	Title	Chordates			Level	2	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	Illustrate basic scientific facts, concepts, principles, and applications related to chordate animal taxonomy.
2	Represent examples for types of interrelationships between different organisms and dissection of their general viscera.
3	List theories and methods applied for interpreting and analyzing data related to chordate animal taxonomy.
4	Illustrate developmental progress of the chordate -related knowledge.
5	Develop the knowledge of vertebrates in the surrounding environment.
6	Understand the relation of chordates to other organisms and their biological link between their structure and surrounding environment.
7	Identification of the morphological and anatomical structure for major groups of chordates from an evolutionary point of view.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate basic scientific facts, concepts, principles, and applications related to chordate animal taxonomy.
	a2	Represent examples for types of interrelationships between different organisms and dissection of their general viscera.
	a3	List theories and methods applied for interpreting and analyzing data related to chordate animal taxonomy.
	a4	Establish the fauna and habitat where the animals live.
	a5	Differentiate between different types of chordates groups.
	a6	Illustrate developmental progress of the chordate -related knowledge.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Assess interrelationships between the major chordate animal taxonomy with an emphasis on vertebrate characters
	b2	Interpret experimental data and relevant literature for enhancing the ability of students to deal with different major body systems of chordates.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Implement appropriate biological techniques in chordates dissection following ethical and safety considerations.
	c2	Utilize different scientific approaches and recent technology for understanding the differences in major body systems of different chordates.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Employ recent communication and information technologies, models and tools effectively in different tasks related to chordates.
	d2	Lead team work effectively for appreciating the values of independent thinking, continuous learning and ethics in the field of taxonomy and dissection of chordates.
4-Contents	1	PHYLUM: (CHORDATA) Introduction The essential structural characteristics of chordates Structure and appearance of the notochord The General characters of chordates.
	2	SUBPHYLUM: (UROCHORDATA) Taxonomy Ex. Ascidia - General characters and internal anatomy - Metamorphoses
	3	SUBPHYLUM: (CEPHALOCHORDATA) Ex. Amphioxus lanceolatus: Morphology of Amphioxus, body wall and movement, blood Circulation, digestive system and feeding mechanism
	4	SUBPHYLUM: VERTEBRATA - SUPPERCLASS:AGNATHA (CYCLOSTOMATA): Ex. Petromyzon fluviatilis, The skeleton, Alimentary canal of the lampreys, Circulatory system of the lampreys and life cycle



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	5	Pisces (Fishes) General characters - Taxonomy	
	6	Class: Chondrichthyes (Cartilaginous Fishes) Classification of Cartilaginous Fishes - General characters - Ex. Dog fish	
	7	Class: Osteichthyes (Bony Fishes) Classification of Bony Fishes - General characters Ex Tilapia nilotic	
	8	Class: (Amphibia) Classification of Amphibia - General characters - Skin, respiration Reproduction - Representative types	
	9	Class: (Reptilia) Classification of Reptiles - General characters - Representative types	
	10	Class: (Aves) Classification of Aves - General characters - Feathers - Representative types	
	11	Class: (Mammalia) Classification of Mammals - General characters - Representative types	
	13	Revision	
5- Teaching and learning method	1	lectures	☐
	2	Open discussion	☐
	3	Data show	☐
	4	Board	☐
6- Teaching and learning methods for students with limited capacity			Not Avialiable.
7-Student Assessment Methods			
a-Using Assessment	1	Mid-Term Examination	
	2	Final-Term Examination	
	3	Oral Examination	
	4	Practical Examination	
b-Assessment Schedule	1	Mid-Term Examination	8
	2	Final-Term Examination	15
	3	Oral Examination	13
	4	Practical Examination	14



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c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-Term Examination	55	73.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	Course notes and Laboratory manual authorized by the Council of Department of Botany		
b-Essential Books(text books)	1	Kenneth V. Kardong (2006). Vertebrates: Comparative Anatomy, Function, Evolution, Fifth Edition, McGraw-Hill.		
	2	Peter, H. Raven; George B. Johnson; Jonathan B. Losos; Susan		
	3	Singer (2005). "Biology" seventh edition. McGraw-Hill Companies, New York USA.		
c-Suggested Books	1	Janvier, P. (1996). Early vertebrates. Oxford Monographs in Geology and Geophysics, 33, Oxford University Press, Oxford		
d-Scientific periodicals or Publications	1	www.highedstudent-aleks.com		
	2	rimisonline.com		
	3	http://www.eul.edu.eg/eulc/libraries/index.aspx		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	PHYLUM: (CHORDATA) Introduction The essential structural characteristics of chordates Structure and appearance of the notochord The General characters of chordates.	1	a1 , a2 , a3 ,	b1, b2,	c1 ,	d1, d2,



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2	SUBPHYLUM: (UROCHORDATA) Taxonomy Ex. Ascidia - General characters and internal anatomy - Metamorphoses	2	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
3	SUBPHYLUM: (CEPHALOCHORDATA) Ex. Amphioxus lanceolatus: Morphology of Amphioxus, body wall and movement, blood Circulation, digestive system and feeding mechanism	3	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
4	SUBPHYLUM: VERTEBRATA - SUPPERCLASS:AGNATH A (CYCLOSTOMATA): Ex. Petromyzon fluviatilis, The skeleton, Alimentary canal of the lampreys, Circulatory system of the lampreys and life cycle	4	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
5	Pisces (Fishes) General characters - Taxonomy	5	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
6	Class: Chondrichthyes (Cartilaginous Fishes) Classification of Cartilaginous Fishes - General characters - Ex. Dog fis	6	a1 , a2 , a3 , a4 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
7	Class: Osteichthyes (Bony Fishes) Classification of Bony Fishes - General characters Ex Tilapia nilotic	7	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,



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8	Class: (Amphibia) Classification of Amphibia - General characters - Skin, respiration Reproduction - Representative types	9,10	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
9	Class: (Reptilia) Classification of Reptiles - General characters - Representative types	11	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
10	Class: (Aves) Classification of Aves - General characters - Feathers - Representative types	12	a1 , a2 , a3 , a4 , a5 , a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
11	Class: (Mammalia) Classification of Mammals - General characters - Representative types	13	a1 , a2 , a3 , a4 , a5 , a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
13	Revision	14				

Course Coordinator Prof. Dr. **Diaa Fawzi Mohammed Mahmoud**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Insects (1)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z251	Title	Insects (1)			Level	2	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	By the end of this course the students will be able to demonstrate knowledge of the general morphological characters of insect, the fundamental structure-function of insect body regions and the different types of insect development and metamorphosis.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Enumerate the general morphological characters of phylum Arthropoda and class Insecta
	a2	Give an account of the general structure and function of the integument
	a3	Describe the main regions of the insect body
	a4	Illustrate the generalized type of insect mouth parts and the different modification in different insects
	a5	Give an account of the stages of insect development and the different types of metamorphosis
b- Intellectual skills: At the end of the course the student should be able to:	b1	Integrate structural and fundamental concepts in explaining the characteristics of insect life and the reasons for success of insects as a group.



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	b2	Apply the information gained from the examination of different shapes and modification of head, thoracic, and abdominal appendages to identify the habitat of any insect in the field which are not included in the formal teaching of this course.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Handle fresh specimens of insects to identify and illustrate the insect body regions
	c2	Use the optical microscope to examine and identify the differences between the different types of head, thoracic, and abdominal appendages and their modifications
d-General and transferable skills: At the end of the course the student should be able to:	d1	Write a report with the standard scientific guidelines
	d2	Use appropriate computer program, packages and download on line data .
	d3	Present reports in seminars, workshops or group meeting
	d4	Work coherently and successfully as a part of a team in project
	d5	Study and find information independently
4-Contents	1	General morphological character of phylum Arthropoda and class Insecta
	2	The integument: structure, function, processes and appendages
	3	Structure of body regions: Head: origin, position relative to body, sclerites, antennae and their modifications- mouth parts (generalized type & modifications)- feeding mechanism.
	4	Thorax: structure, wing (articulation-types-venation- movement),legs (structure- articulation- modifications - movement).
	5	Abdomen: structure, appendages not associated with reproduction, male and female genitalia and modified ovipositor
	6	Development and metamorphosis: The egg: hatching, post-embryonic development. Metamorphosis: types of metamorphosis, larvae& pupae- emergence from cocoon - development of adult feature.
	7	Review and feedback activities
	8	Revision
5- Teaching and learning method	1	lecture to develop the knowledge and understand of the main concepts of insect anatomy .





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	2	Discussion to initiate critical thinking and to let the students know how to work in team		✓
	3	Practical to develop both practical &professional skills .		✓
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Prepared by the course instructors		
b-Essential Books(text books)				
c-Suggested Books	1	Chapman, R.F. (2002): The Insects: structure and Function. UK: Cambridge University Press		
d-Scientific periodicals or Publications	1	Applaid Entomology		



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Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	General morphological character of phylum Arthropoda and class Insecta	1	a1 , a3 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,
2	The integument: structure, function, processes and appendages	2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,
3	Structure of body regions: Head: origin, position relative to body, sclerites, antennae and their modifications- mouth parts (generalized type & modifications)- feeding mechanism.	2-4	a1 , a3 , a4 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,
4	Thorax: structure, wing (articulation-types-venation-movement), legs (structure-articulation- modifications - movement).	6-8	a1 , a3 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,
5	Abdomen: structure, appendages not associated with reproduction, male and female genitalia and modified ovipositor	9-10	a1 , a3 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,
6	Development and metamorphosis: The egg: hatching, post-embryonic development. Metamorphosis: types of metamorphosis, larvae& pupae- emergence from cocoon - development of adult feature.	11, 12	a1 , a3 , a5 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 , d1 , d2 , d3 ,



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7	Review and feedback activities	13				d4 , d5 , d1 , d2 , d3 ,
8	Revision	14				

Course Coordinator Prof. Dr. Afaf Mohammed Mustafa El-Gendy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

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Course Specification For

Plant Anatomy 2

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B211	Title	Plant Anatomy 2			Level	2	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course inspects the anatomy of vascular plants with emphasis on primary, secondary and abnormal thickening of root, stem and leaf.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recall the types of the meristems and the characteristics of secondary dermal structure
	a2	State different types of stele and the root-stem transition
	a3	Label different types of vascular cambium activity.
	a4	List secondary structure of roots and stems and the abnormal secondary structure.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Classify the meristems and the characteristics of secondary dermal structure
	b2	Describe types of vascular cambium activity, different types of stele and the root-stem transition
	b3	Illustrate secondary structure of roots and stems and the abnormal secondary structure



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c-Professional and practical skills: At the end of the course the student should be able to:	<table><tr><td>c1</td><td>Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.</td></tr></table>	c1	Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.														
c1	Collect and preserve plant samples and prepare sections for microscopic examination and identification of different types of cells and tissues.																
d-General and transferable skills: At the end of the course the student should be able to:	<table><tr><td>d1</td><td>Demonstrate ability to work in groups.</td></tr></table>	d1	Demonstrate ability to work in groups.														
d1	Demonstrate ability to work in groups.																
4-Contents	<table><tr><td>1</td><td>Classification of meristems Secondary dermal structure</td></tr><tr><td>2</td><td>Types of stele</td></tr><tr><td>3</td><td>Anatomy of roots 3.1. primary structure 3.2. secondary structure</td></tr><tr><td>4</td><td>Anatomy of stem 4.1. primary structure 4.2. secondary structure 4.3. abnormal structure</td></tr><tr><td>5</td><td>Anatomy of root stem transition - Different types of vascular cambium activities</td></tr><tr><td>6</td><td>Ecological anatomy</td></tr><tr><td>7</td><td>Practical and oral exam</td></tr><tr><td>8</td><td>Final exam</td></tr></table>	1	Classification of meristems Secondary dermal structure	2	Types of stele	3	Anatomy of roots 3.1. primary structure 3.2. secondary structure	4	Anatomy of stem 4.1. primary structure 4.2. secondary structure 4.3. abnormal structure	5	Anatomy of root stem transition - Different types of vascular cambium activities	6	Ecological anatomy	7	Practical and oral exam	8	Final exam
1	Classification of meristems Secondary dermal structure																
2	Types of stele																
3	Anatomy of roots 3.1. primary structure 3.2. secondary structure																
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5	Anatomy of root stem transition - Different types of vascular cambium activities																
6	Ecological anatomy																
7	Practical and oral exam																
8	Final exam																
5- Teaching and learning method	<table><tr><td>1</td><td>Lecture</td><td>☐</td></tr><tr><td>2</td><td>Discussion</td><td>☐</td></tr><tr><td>3</td><td>Practical</td><td>☐</td></tr></table>	1	Lecture	☐	2	Discussion	☐	3	Practical	☐							
1	Lecture	☐															
2	Discussion	☐															
3	Practical	☐															
6- Teaching and learning methods for students with limited capacity		Not Available.															
7-Student Assessment Methods																	
a-Using Assessment	<table><tr><td>1</td><td>Final written exam</td><td></td></tr><tr><td>2</td><td>Practical exam</td><td></td></tr><tr><td>3</td><td>Oral Examination</td><td></td></tr></table>	1	Final written exam		2	Practical exam		3	Oral Examination								
1	Final written exam																
2	Practical exam																
3	Oral Examination																



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	4	Mid-Term and student activity		
b-Assessment Schedule	1	Final written exam	15	
	2	Practical exam	14	
	3	Oral Examination	14	
	4	Mid-Term and student activity	8	
c-Weighting of Assessments	1	Final written exam	35	70.00%
	2	Practical exam	10	20.00%
	3	Oral Examination	2.5	5.00%
	4	Mid-Term and student activity	2.5	5.00%
8-List of References				
a-Course notes	1	Course notes prepared by the staff		
b-Essential Books(text books)	1	Panday, B.P. An introduction to plant anatomy. 1993. S. Chand & Co. LTD. New Delhi		
c-Suggested Books	1	Evert, R.F. and Eichhorn, S.E. 2006. Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function, and Development, 3rd Edition. ISBN: 978-0-471-73843-5. 624 pages		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Classification of meristems Secondary dermal structure	1	a1 ,	b1 ,	c1 ,	
2	Types of stele	2,3	a2 ,	b2 ,		d1 ,



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3	Anatomy of roots 3.1. primary structure 3.2. secondary structure	4,5	a2 ,	b2 ,	c1 ,	
4	Anatomy of stem 4.1. primary structure 4.2. secondary structure 4.3. abnormal structure	6,7	a3 ,	b2 ,	c1 ,	d1 ,
5	Anatomy of root stem transition - Different types of vascular cambium activities	8-10	a2 ,	b2 ,		
6	Ecological anatomy	11-13	a4 ,	b3 ,		d1 ,
7	Practical and oral exam	14				
8	Final exam	15				

Course Coordinator Prof. Dr. **Mai Sayed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Taxonomy of the flowering Plants (1)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	B231	Title	Taxonomy of the flowering Plants (1)			Level	2	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course provides an introduction to the principles and practice of taxonomy. Emphasis is placed on understanding the historical context, acquiring the facility to use floral characters to identify flowering plants, as well as investigative procedures used by taxonomists in developing classifications.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define plant taxonomy
	a2	Enumerate the flower and floral parts and types inflorescence and fruits
	a3	Memorize systems of classifications
	a4	List Dicotyledoneae and Monocotyledoneae
	a5	Label taxonomic Key of the studied families
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe the morphology of the flowerings plants using all morphological characters especially the flower and inflorescence characters.
	b2	Classify the flowering plants using artificial keys.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Employ research techniques, information retrieval, modeling, taxonomic keys, bioassays and tools of molecular biology.	
	c2	Select a representative sample considering its validity, accuracy and reliability during collection	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Use information and communication technology effectively.	
4-Contents	1	Introduction: Plant Taxonomy, Terminology, classification, identification, and nomenclature	
	2	The Flower 2.1 Floral parts 2.2 Arrangement of Floral parts 2.3. Placentation 2.4. Dissecting of the flower	
	3	types of inflorescence	
	4	types of fruits	
	5	Classification of Flowering plants 5.1 Systems of classification 5.2 systematic position of some families.	
	6	Class: Dicotyledoneae 6.1 Dialypetalae 6.2 Monoclamydae 6.3 Sympetalae	
	7	Monocotyledoneae	
	8	Key of the studied families	
	9	Practical Exam	
5- Teaching and learning method	1	Lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Midterm Exam.		
	2	Oral exam		
	3	Practical		
	4	Final Exam		
b-Assessment Schedule	1	Midterm Exam.	8	
	2	Oral exam	14	
	3	Practical	14	
	4	Final Exam	15	
c-Weighting of Assessments	1	Midterm Exam.	2.5	3.33%
	2	Oral exam	2.5	3.33%
	3	Practical	15	20.00%
	4	Final Exam	55	73.33%
8-List of References				
a-Course notes	1	By department stuff.		
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction: Plant	1,2	a1 ,	b1 ,		



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	Taxonomy, Terminology, classification, identification, and nomenclature					
2	The Flower 2.1 Floral parts 2.2 Arrangement of Floral parts 2.3. Placentation 2.4. Dissecting of the flower	3,3	a2 ,	b1 ,	c1 ,	d1 ,
3	types of inflorescence	5,6	a2 ,	b1 ,	c1 ,	d1 ,
4	types of fruits	7,8	a2 ,	b1 ,	c1 ,	
5	Classification of Flowering plants 5.1 Systems of classification 5.2 systematic position of some families.	9,10	a3 ,	b2 ,	c2 ,	
6	Class: Dicotyledoneae 6.1 Dialypetalae 6.2 Monoclamydae 6.3 Sympetalae	11,12	a4 ,	b2 ,	c2 ,	
7	Monocotyledoneae	13		b2 ,		
8	Key of the studied families	13	a5 ,	b2 ,		
9	Practical Exam	14				

Course Coordinator Prof. Dr. **Hesham H. Elfayoumi**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **organic chemistry (chemistry of aromatic compounds)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C222	Title	organic chemistry (chemistry of aromatic compounds)			Level	2	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	Understand the concept of aromaticity and its criteria.
2	Conclude the nature of aromatic compounds, their properties.
3	study the electrophilic and nucleophilic reactions of aromatic compounds
4	To familiarize the students with synthesis and reactions of some interesting aromatic compounds.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Know the meaning of aromaticity and its criteria
	a2	Understand the extra stability of aromatic compounds
	a3	Identify aromatic compounds from antiaromatic ones
	a4	Understand the mechanisms of both electrophilic and nucleophilic aromatic substitution.
	a5	Evaluate the synthetic procedures of different aromatic compounds
	a6	Know the synthetic applications of some important aromatic compounds



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Conclude information in both lectures and library from some exercises to apply the studied topics in course .	
	b2	Think about the chemical transformation between the different aromatic compounds	
	b3	Understand the different chemical reactivity of nitro,amino, halo,azo, sulphonic, carboxylic, aldehydic, ketonic aromatic compounds	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Identify aromatic compounds	
	c2	Synthesis of some aromatic compounds and other derived compounds	
	c3	Can synthesize some biologically and industrially important compounds from aromatic ones.	
	c4	Evaluate the methods of separation of different aromatic compounds by knowing their properties	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Present independent investigative skills by using textbooks and other sources (Internet, Library,...)	
	d2	Work in a team	
	d3	Write report	
4-Contents	1	Introduction, aromatic properties, aromatic-antiaromatic compounds structure of benzene and reactions	
	2	Electrophilic aromatic substitution-, orientation and directing groups and their effects	
	3	Nucleophilic aromatic substitution-Benzyne intermediate	
	4	Aromatic nitrocompounds	
	5	Aromatic halogen compounds and aromatic amines	
	6	Mid-Term Examination	
	7	Aromatic sulphonic acids, synthesis and reactions and applications..	
	8	Aromatic phenols, aromatic aldehydes	
	9	Aromatic ketones, aromatic carboxylic acids and their derivatives.	
	10	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion.	☐



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	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination.		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination.	14	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-term Examination	55	73.33%
	3	Oral Examination.	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students		
b-Essential Books(text books)	1	Basic principles of organic chemistry - Finar volume 1 (1985- Longman) - Mareson and Boyer, 1983, Alyn and Bacon. Inc.		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction, aromatic properties, aromatic-antiaromatic compounds structure of benzene and reactions	1	a1 , a2 , a3 ,		c1 ,	d1 , d3 ,
2	Electrophilic aromatic substitution-, orientation and directing groups and their effects	2	a4 ,	b1 ,	c3 ,	d1 , d2 , d3 ,
3	Nucleophilic aromatic substitution-Benzyne intermediate	3	a4 ,	b1 ,	c3 ,	d1 , d2 , d3 ,
4	Aromatic nitrocompounds	4	a1 ,	b1 , b3 ,	c5 ,	d1 , d2 , d3 ,
5	Aromatic halogen compounds and aromatic amines	5-7	a1 ,	b1 , b3 ,	c5 , c6	
6	Mid-Term Examination	8				
7	Aromatic sulphonic acids, synthesis and reactions and applications..	9-10	a1 , a6 ,	b1 , b3 ,	c3 , c5	d1 , d2 , d3 ,
8	Aromatic phenols, aromatic aldehydes	11	a1 , a6 ,	b1 , b3 ,	c3 , c4 ,	d1 , d2 , d3 ,
9	Aromatic ketones, aromatic carboxylic acids and their derivatives.	12-13	a1 , a6 ,	b1 , b3 ,	c3 , c4 , c5	d1 , d2 , d3 ,
10	Revision	14				

Course Coordinator Prof. Dr. Afaf El-Gindy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



Fayoum Univeristy
Faculty of Science



Course Specification For **Carbohydrates and fats (1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C224	Title	Carbohydrates and fats (1)			Level	2	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	To induce the students to classification of carbohydrates.
2	To familiarize the students to identify the configurationally formulas such as pyranose structure in aldohexoses and ketohexoses ring structure.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand the classification of carbohydrates.
	a2	Know the configurational formulas
	a3	Know the different types of carbohydrates (mono, di and polysaccharides).
	a4	Understand the sequence of carbohydrates.
	a5	Study the chemical reactions of carbohydrates.
	a6	Compare between mono, di and polysaccharides.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Classify the different types of carbohydrates, conformation and structure.
	b2	Apply names of carbohydrates
	b3	Conclude the chemical behaviour of different carbohydrates.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Collect the types and classification of carbohydrates.	
	c2	Criticize methods of chemical reactions.	
	c3	recognize the meaning of carbohydrates	
	c4	Solve different problems related to the course.	
	c5	To be familiarize with digestion of carbohydrates	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Collect, analyze and interpret data	
	d2	The student would be able to use self learning.	
	d3	Work in a team	
	d4	Write report .	
4-Contents	1	Classification of carbohydrates. 1.1- Monosaccharides (Configurational formulas)	
	2	Pyranose structure in aldohexoses	
	3	Ring structure in ketohexoses. Configurational formulas in cyclicforms in monosaccharides	
	4	Equilibration in glucose solution-Planar ring projections of sugar formula	
	5	Glycosides	
	6	Mid-Term Examination	
	7	Chemical reactions of monosaccharides	
	8	Disaccharides, structure of sucrose-Structure of maltose-Structure of cellubiose	
	9	Polysaccharides, general methods fro structure determination- structure of cellulose-starch-constitution of starch	
	10	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion.	☐
	3	Scientific Visits	☐



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Practical Examination		
	2	Final-term Examination		
	3	Mid-Term Examination		
	4	Oral Examination.		
b-Assessment Schedule	1	Practical Examination	14	
	2	Final-term Examination	15	
	3	Mid-Term Examination	8	
	4	Oral Examination.	14	
c-Weighting of Assessments	1	Practical Examination	15	20.00%
	2	Final-term Examination	55	73.33%
	3	Mid-Term Examination	2.5	3.33%
	4	Oral Examination.	2.5	3.33%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students written by lecturer		
b-Essential Books(text books)	1	Organic chemistry,10,1 Finar, volume 1, 5th edition.		
	2	1 (1982- Longman)		
	3	Finar, volume 2, by Mareson and Boyer, 2000.,		
c-Suggested Books				
d-Scientific periodicals or Publications	1	Chem.. web site		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills



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1	Classification of carbohydrates. 1.1- Monosaccharides (Configurational formulas)	1	a1 , a2 ,	b1 ,	c1 ,	d1 , d3 , d4 ,
2	Pyranose structure in aldohexoses	2	a3 , a4 ,	b1 ,	c4 ,	d1 , d2 , d3 ,
3	Ring structure in ketohexoses. Configurational formulas in cyclicforms in monosaccharides	3	a3 , a4 ,	b1 ,	c4 ,	d1 , d2 , d3 ,
4	Equilibration in glucose solution-Planar ring projections of sugar formula	4	a3 , a4 ,	b1 ,	c4 ,	d1 , d2 , d3 ,
5	Glycosides	5-6-7	a5 ,	b2 ,	c4 ,	d1 , d2 , d3 , d4 ,
6	Mid-Term Examination	8				
7	Chemical reactions of monosaccharides	9-10	a4 , a5 , a6 ,	b3 ,	c2 , c4 ,	d1 , d2 , d3 ,
8	Disaccharides, structure of sucrose-Structure of maltose-Structure of cellulbiose	11	a1 , a3 , a5 , a6 ,	b3 ,	c2 , c4 ,	d1 , d2 , d3 ,
9	Polysaccharides, general methods fro structure determination- structure of cellulose-starch-constitution of starch	12-13	a1 , a3 , a5 , a6 ,	b3 ,	c2 , c4 ,	d1 , d2 , d3 ,
10	Revision	14				

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Faculty of Science



Course Specification For **General Mathematics**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Mathematics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	M216	Title	General Mathematics			Level	2	Semester	2
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge of the basic concepts of Different methods of integration. Also, the basic concepts of Ordinary Differential Equations, and methods of solution of first and higher order differential equations

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define Different methods of integration
	a2	Define differential equation in first order and higher order.
	a3	Mention the solution of differential equation.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze the properties Integrals of functions.
	b2	Interpret how use Integrals gives trigonometric functions and exponential function.
	b3	Apply different techniques to solving differential equations of first-order and higher-order.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Prove and solve different problems relating the course material	
	c2	Design some forms in geometry the solution of differential equation.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work coherently and successfully as a part of a team .	
	d2	Find effective and realistic solution for work problems through analysis of input and right anticipation .	
	d3	Gain a communication skills (present reports in seminars , work shops).	
	d4	Manager its time.	
4-Contents	1	SubstDifferent methods of integration (integration by partial fractions and by parts)	
	2	Differential equations (define the order, the degree, the solution and the general solution).	
	3	Differential equations of the first order and first degree	
	4	Differential equations of higher order (linear D.E. with constant coefficients homogeneous and non homogeneous)	
5- Teaching and learning method	1	Lecturer	☒
	2	Discussion	☒
	3	Practical	☒
	4	Semester work	☒
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final written	
	2	Semester work	
	3	Oral.	
	4	Mid- term exam.	
b-Assessment Schedule	1	Final written	15
	2	Semester work	on all weeks
	3	Oral.	13
	4	Mid- term exam.	8



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c-Weighting of Assessments	1	Final written	40	80.00%
	2	Semester work	2.5	5.00%
	3	Oral.	2.5	5.00%
	4	Mid- term exam.	5	10.00%
8-List of References				
a-Course notes	1	Courses notes prepared by staff members of math Department.		
b-Essential Books(text books)	1	Cox, W., Ordinary Differential Equations, Arnold, 1996		
c-Suggested Books	1	Lindsay, K. and Weiglhofer, W., Ordinary Differential Equations and Applications, Albion, 1999		
d-Scientific periodicals or Publications	1	different web sites of the mathematics science		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	SubstDifferent methods of integration (integration by partial fractions and by parts)	1-3	c1,	b1,	a1,	d1,
2	Differential equations (define the order, the degree, the solution and the general solution).	4	c1,	b1,	a1,a2,	d1,d2,d3,
3	Differential equations of the first order and first degree	5-8	c1,c2	b1, b2	a2,a3	d1,d2,



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4	Differential equations of higher order (linear D.E. with constant coefficients homogeneous and non homogeneous)	9-13	c1,c2	b2,b3,	a2,a3	d1,d2, d3

Course Coordinator Prof. Dr.

ممدوح ربيع

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

إدارة أعمال

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	UP132	Title	إدارة أعمال	Level	2	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1 يهدف هذا المقرر تعريف الطلاب بأساسيات إدارة الأعمال

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	يعرف التحليل البيئي و التخطيط الإقليمي والتخطيط القطاعي
	a2	يعدد برامج التنمية الإدارية
	a3	يتعرف على الدراسات التسويقية والكفاءة الإنتاجية والفاعلية التنظيمية
	a4	يذكر الرقابة الشعبية و التضخم الوظيفي
b- Intellectual skills: At the end of the course the student should be able to:	b1	يفرق بين التحليل البيئي و التخطيط الإقليمي والتخطيط القطاعي
	b2	يقارن بين برامج التنمية الإدارية
	b3	يحلل الدراسات التسويقية والكفاءة الإنتاجية والفاعلية التنظيمية
	b4	يطبق الرقابة الشعبية و التضخم الوظيفي



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c-Professional and practical skills: At the end of the course the student should be able to:	c1 يطبق نظام إدارى		
d-General and transferable skills: At the end of the course the student should be able to:	d1 يكتسب مهارات إدارة الوقت d2 العمل فى فريق		
4-Contents	1	التحليل البيئى	
	2	التخطيط الإقليمى والتخطيط القطاعى	
	3	برامج التنمية الإدارية	
	4	الدراسات التسويقية	
	5	الكفاءة الإنتاجية	
	6	الفاعلية التنظيمية	
	7	الرقابة الشعبية	
	8	التضخم الوظيفى	
5- Teaching and learning method	1	Lectures	☐
	2	Discussion	☐
	3	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Avaliable.
7-Student Assessment Methods			
a-Using Assessment	1	Final written Examination	
	2	Student activity	
	3	Oral exam.	
b-Assessment Schedule	1	Final written Examination	15
	2	Student activity	on all weeks
	3	Oral exam.	14



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c-Weighting of Assessments	1	Final written Examination	45	90.00%
	2	Student activity	2.5	5.00%
	3	Oral exam.	2.5	5.00%
8-List of References				
a-Course notes	1	prepared by Dept. staff		
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications	1	library Periodicals, Web sites, ... etc		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	التحليل البيئي	1,2	a1 ,	b1 ,		
2	التخطيط الإقليمي والتخطيط القطاعي	3,4	a1 ,	b1 ,		d1 ,
3	برامج التنمية الإدارية	5	a2 ,	b2 ,		d1 , d2 ,
4	الدراسات التسويقية	6	a3 ,	b3 ,	c1 ,	d2 ,
5	الكفاءة الإنتاجية	7,8	a3 ,	b3 ,		d1 ,
6	الفاعلية التنظيمية	9,10	a3 ,	b3 ,		
7	الرقابة الشعبية	11,12	a4 ,	b4 ,		d1 ,
8	التضخم الوظيفي	13,14	a4 ,	b4 ,	c1 ,	

Course Coordinator Prof. Dr. All Departments

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



THIRD LEVEL

FIRST SEMESTER



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Course Specification For **Physiology1+2**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z383	Title	Physiology1+2			Level	3	Semester	1
Lecture (h/w)	2	Practical (h/w)	4	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	provide general knowledge on digestion, metabolism and endocrine physiology.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Identify the properties and structure of hormones
	a2	Understand the normal function of the different parts of the endocrine glands, control & regulation of their function
	a3	Compare between hyper & hypo function for each hormone
	a4	Identify the hormones that are especially important to normal growth and discuss their roles
	a5	Understand the normal function of the different parts of the digestive system, control & regulation of their function.
	a6	Describe the digestion, absorption & metabolism of carbohydrates, lipids & proteins.
b- Intellectual skills: At the end of the course the student should be able to:	b1	recognize the hormonal role in everyday occurrences.
	b2	Explain how hormones interact to produce coordinated physiological responses
	b3	Explain how the endocrine system responds to stress



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	b4	Explain how ingested materials are propelled through the digestive tract
	b5	Explain the functions of intestinal secretions and discuss the significance of digestion in the small intestine
	b6	Explain different physiological terminology
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Choose the appropriate physiological tests to interpret the processes of digestion
	c2	Calibrate the necessary hormonal assays
d-General and transferable skills: At the end of the course the student should be able to:	d1	Conduct self-learning and research work
	d2	The ability to work within a team effectively
4-Contents	1	Chemical classes of hormones
	2	Interaction between hormones & receptors -Calcium as a Second Messenger
	3	Endocrine organs: location & function - Hypothalamic/pituitary interaction
	4	Pituitary hormones & their effects
	5	Thyroid/Parathyroid hormones & calcium ion homeostasis.
	6	Effects of adrenal gland hormones
	7	Growth hormones. Hormones of gastrointestinal tract
	8	Hormones of the testes, ovaries, & adipose tissues.
	9	Endocrine system responds to stress.
	10	Feedback-Hormonal control of glucose metabolism, electrolytes, osmolality & thermoregulation
	11	Nutrition & Absorption
	12	classification of enzymes
	13	Enzyme kinetics
	14	Salivary digestion- Gastric digestion- Intestinal digestion
	15	Metabolism of carbohydrate-protein-fats
	16	Metabolism in starvation, diabetes mellitus & injury



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	17	Revision		
	18	Lab		
	19	Assessing Starch Digestion by Salivary Amylase -Exploring Amylase Substrate Specificity - Assessing Pepsin Digestion of Protein - Assessing Lipase Digestion of Fat		
	20	Use of gland slides & illustrations - Use computers & internet to carry virtual experiments - Dealing with experimental animals as: rats to recognize tests for endocrinal gland functions.		
5- Teaching and learning method	1	Lecturer (Data show projectors)	✓	
	2	Discussion	✓	
	3	Practical.	✓	
	4	Encourage students to use online and library resources.	✓	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Practical Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Practical Examination	13	
	4	Oral Examination	10	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	3.33%
	2	Final-Term Examination	55	73.33%
	3	Practical Examination	15	20.00%
	4	Oral Examination	2.5	3.33%



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8-List of References		
a-Course notes	1	Power point slides
b-Essential Books(text books)	1	Essentials of Anatomy and Physiology / Edition 4 by Frederic H. Martini, Edwin F. Bartholomew
c-Suggested Books	1	Human Physiology (Gillian Pocock & Christopher D.Richards)
	2	Essential Endocrinology (Brook & Marshall, Blackwell science)
d-Scientific periodicals or Publications	1	http://wps.pearsoned.it/fisiologia_umana5/165/42312/10831893.cw/index.html
	2	ttp://wps.aw.com/bc_martini_eap_4/40/10467/2679558.cw/index.html

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Chemical classes of hormones	1	a1 , a2 , a3 , a4 , a5 ,	b1 ,		
2	Interaction between hormones & receptors - Calcium as a Second Messenger	2	a1 , a3 ,	b2 , b3 , b4 ,		d1 , d2 ,
3	Endocrine organs: location & function - Hypothalamic/pituitary interaction	3				
4	Pituitary hormones & their effects	4,5				
5	Thyroid/Parathyroid hormones & calcium ion homeostasis.	6	a1 , a2 , a3 , a4 , a5 ,		c1 , c2 ,	d1 ,
6	Effects of adrenal gland hormones	7	a1 , a2 , a3 , a4 , a5 ,		c1 , c2 ,	d1 , d2 ,



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7	Growth hormones. Hormones of gastrointestinal tract	9	a1 , a2 , a3 , a4 , a5 , a6 ,		c1 , c2 ,	d1 , d2 ,
8	Hormones of the testes, ovaries, & adipose tissues.	10	a1 , a2 , a3 , a4 ,			d1 , d2 ,
9	Endocrine system responds to stress.	11	a4 ,		c1 , c2 ,	d1 , d2 ,
10	Feedback-Hormonal control of glucose metabolism, electrolytes, osmolality & thermoregulation	12,13	a1 , a2 , a3 , a4 , a5 , a6 ,		c1 , c2 ,	
11	Nutrition & Absorption	1	a1 , a2 , a3 , a4 , a5 , a6 ,			d2 ,
12	classification of enzymes	2	a1 , a2 , a3 , a4 , a5 , a6 ,			d2 ,
13	Enzyme kinetics	3				
14	Salivary digestion- Gastric digestion- Intestinal digestion	4-7			c1 , c2 ,	d2 ,
15	Metabolism of carbohydrate- protein-fats	8-11			c1 , c2 ,	d2 ,
16	Metabolism in starvation, diabetes mellitus & injury	12,13	a1 , a2 , a3 , a4 , a5 , a6 ,		c1 , c2 ,	d2 ,
17	Revision	14				
18	Lab					
19	Assessing Starch Digestion by Salivary Amylase - Exploring Amylase Substrate Specificity - Assessing Pepsin Digestion of Protein - Assessing Lipase Digestion of Fat	1-10			c1 , c2 ,	d1 , d2 ,



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20	Use of gland slides & illustrations - Use computers & internet to carry virtual experiments - Dealing with experimental animals as: rats to recognize tests for endocrinal gland functions.	11-13			c1 , c2 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Sayed Fouad Abed El-Aziz + Naglaa El-Sayed Refaat Ismail**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

QA FSFU DB



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Course Specification For

Entomology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z351	Title	Entomology			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Properly identify the various internal organs/systems of an insect.
2	Integrate between the structure and function of the different internal organs/systems.
3	Improve their skills in dissecting and exposing the internal organs/systems of the insect.
4	Identify, precisely, and differentiate between the histological preparations of the different internal body organs.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate the internal anatomy of the different body systems.
	a2	Name the components of each system and describe the histological features of its components.
	a3	Give an account of the function of the different body system
b- Intellectual skills: At the end of the course the student should be able to:	b1	Compare between the internal organs of different insects
	b2	Compare between the different histological preparations
	b3	Predict the relation between the types of food and the structure of the alimentary canal .



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use appropriate dissecting tools to dissect, expose and illustrate the different insect internal organs.	
	c2	Use the optical microscope to examine and identify the histological preparations.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Write a report with the standard scientific guidelines. .	
	d2	Use appropriate computer program, packages and download on- line data	
	d3	Present reports in seminars, workshops or group meeting	
	d4	Work coherently and successfully as a part of a team in project	
	d5	Study and find information independently	
4-Contents	1	The digestive system: general structure and function, the fore-, mid- and hind gut (histology) digestion.	
	2	The circulatory system: diaphragms and sinuses, dorsal vessel, accessory pulsating organs, circulation, the haemolymph (function – structure).	
	3	The respiratory system: trachea and their arrangement, air sacs, spiracles, types of respiratory systems, respiration in aquatic and endoparasitic insects	
	4	Reproductive system: 1- the male reproductive system: general structure, testis, structure of sperm tubes, male accessory glands 2- The female reproductive system: general structure, ovary, types of ovarioles, oviducts, genital chamber and its derivatives, (spermatheca, accessory glands), fertilization, type of reproduction.	
	5	**The nervous system: general structure, the nerve cell, the central nervous system (CNS), the visceral and peripheral nervous systems, reflex arc.	
	6	**The excretory organs: Malpighian tubules, fat body, other excretory organs and tissues	
	7	Revision	
5- Teaching and learning method	1	lecture to develop the knowledge and understand	✓
	2	Discussion. to initiate critical thinking and to let the students know how to work in team.	✓
	3	Practical. to initiate critical thinking and to let the students know how to work in team.	✓



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	4	Data show	✓	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid_Term Examination	To assess knowledge and understanding.	
	2	Final_Term Examination	to assess knowledge and understanding .	
	3	Practical Examination	to assess professional and practical skills	
	4	Oral Examination	to assess presentation skills .	
b-Assessment Schedule	1	Mid_Term Examination	8	
	2	Final_Term Examination	15	
	3	Practical Examination	14	
	4	Oral Examination	9	
c-Weighting of Assessments	1	Mid_Term Examination	2.5	5.00%
	2	Final_Term Examination	35	70.00%
	3	Practical Examination	10	20.00%
	4	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	The handout prepared by the instructor		
b-Essential Books(text books)	1	Chapman, R.F. (2002): The Insects: Structure and Function. The English Universities Press Ltd		
	2	Imms, General Textbook of Entomology		
	3	Fundamentals of Entomology.Richard J.Elzinga.-		
	4	The world of insects Chinery,Michae		
c-Suggested Books	1	Gullan ,P.J.andCranston ,P.S. (2000):The insects:An outline of Entomology 2nd edition. Blak well Science,Inc		
	2	Grzimek,s Animal Life Encyclopedia		



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d-Scientific periodicals or Publications	1	www.sciencedirect.com
	2	www.pubmed.com
	3	www.google.com

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	The digestive system: general structure and function, the fore-, mid- and hind gut (histology) digestion.	1,2	a1 , a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,
2	The circulatory system: diaphragms and sinuses, dorsal vessel, accessory pulsating organs, circulation, the haemolymph (function – structure).	3, 4	a2 , a3 ,	b1 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,
3	The respiratory system: trachea and their arrangement, air sacs, spiracles, types of respiratory systems, respiration in aquatic and endoparasitic insects	5,6	a2 , a3 ,	b1 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,



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4	Reproductive system: 1- the male reproductive system: general structure, testis, structure of sperm tubes, male accessory glands 2- The female reproductive system: general structure, ovary, types of ovarioles, oviducts, genital chamber and its derivatives, (spermatheca, accessory glands), fertilization, type of reproduction.	7-10	a2 , a3 ,	b1 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,
5	**The nervous system: general structure, the nerve cell, the central nervous system (CNS), the visceral and peripheral nervous systems, reflex arc.	11-12	a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,
6	**The excretory organs: Malpighian tubules, fat body, other excretory organs and tissues	13	a2 , a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,
7	Revision	14	a1 , a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 ,

Course Coordinator Prof. Dr. Afaf El-Gindy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For

Basic ecology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z371	Title	Basic ecology			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The aim of this course to familiarize the students with the basic concepts of ecological roles of animal behavior.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	mention the basic concepts of animal ecology
	a2	determine the main types of animal ecosystem
	a3	describe the environment of factors affecting animal distribute
	a4	realize human impacts on natural resources
	a5	illustrate the food chain and pyramids of energy and their relation to animal ecology
	a6	define characteristics of fresh water ecosystem
	a7	realize the extent of aquatic pollution and its impact on aquatic life
	a8	realize the inter and intra-specific relationships between different groups of animals and their surrounding habitats



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b- Intellectual skills: At the end of the course the student should be able to:	b1	detect the relationships between biological diversity of a given community and its stability	
	b2	identify the human impact on natural resources and pollution.	
	b3	discuss the various animal adaptations to different ecosystems including desert ,water and other aquatic habitats.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	collect different samples from different habitats	
	c2	investigate different ecological samples	
	c3	acquire hands- on practical skills	
	c4	interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.	
	c5	draw relation between environment of factors and animal adaptations	
d-General and transferable skills: At the end of the course the student should be able to:	d1	plan and implement efficient modes of working.	
	d2	interact with other people and to engage in team –working	
4-Contents	1	Introducing animal ecology.	
	2	Environmental factors surrounding animal in the ecosystems (biotic and abiotic factors).	
	3	Food chain and energy follow.	
	4	Inter and intraspecific relationships.	
	5	Adaptation of animal to different habitats.	
	6	Types of pollutions affecting animals.	
	7	Review questions	
5- Teaching and learning method	1	lecture	✓
	2	Open discussions.	✓
	3	Lab work.	✓
	4	Soft ware resources	✓



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	5	Over head transparencies		
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Fina-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Fina-Term Examination	15	
	3	Oral Examination	10	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Fina-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Pre-prepared handouts are being provided to students		
b-Essential Books(text books)	1	Chapman , J.I. and Reiss , M.J. (1995) : "Ecology , Principles and application" Cambridge University press.		
	2	Closs , G.J Downes , B, and Boulton , A(2003): " Freshwater Ecology" Blackwell publishing.		
	3	Richard Mayes, F (2001) : "Environment of Science" , printed in Singafore		
c-Suggested Books	1	Chapman , J.I. and Reiss , M.J. (1995) : "Ecology , Principles and application" Cambridge University press		
d-Scientific periodicals or Publications	1	Periodicals		
	2	Web sites		



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Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introducing animal ecology.	1	a1 , a2 , a3 , a4 , a5 ,	b1 , b3 ,	c1 , c2 , c3 , c4 ,	
2	Environmental factors surrounding animal in the ecosystems (biotic and abiotic factors).	2-4	a2 , a3 , a4 ,	b1 , b3 ,	c1 , c2 , c3 , c4 ,	
3	Food chain and energy follow.	5-6	a5 ,	b1 , b3 ,	c1 , c2 , c3 , c4 ,	
4	Inter and intraspecific relationships.	7-8	a7 ,	b1 , b3 ,	c1 , c2 , c3 , c4 ,	d2 ,
5	Adaptation of animal to different habitats.	9-11	a8 ,	b1 , b3 ,	c1 , c5 ,	d1 ,
6	Types of pollutions affecting animals.	12-13	a6 ,	b2 ,	c1 , c2 , c3 , c4 ,	d1 ,
7	Review questions	14	a1 , a2 , a3 , a4 , a5 , a6 , a7 , a8 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Khalid Hussein Zaghloul**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Organic reaction mechanism (1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C321	Title	Organic reaction mechanism (1)			Level	3	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The course of reaction mechanism of organic compounds should lead the student to understand the basic reactions and their mechanisms. This course is very important class to identify the different methods to synthesis of organic compounds such as drugs, dyes, and other synthesis of organic compounds.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand the types of organic reactions
	a2	Know the classification of reaction mechanisms and various types of intermediates.
	a3	Know different factors affecting the stability of different intermediates.
b- Intellectual skills: At the end of the course the student should be able to:	b1	analysis any type of organic reaction.
	b2	classify the organic reactions such as substitution, or addition, or elimination and or rearrangement reaction and conformational analysis.
	b3	Deduce the intermediates formed during the reaction



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	recognise what the meaning of reaction mechanism,	
	c2	collect the types and classification the reaction mechanism organic compounds.	
	c3	criticize the method of reactions.	
	c4	suggest the method of isolation of the intermediate.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	collect, record, analyze and interpret data from a range of sources.	
	d2	use information technology applications.	
	d3	The student would be able to use self learning.	
	d4	present independent investigative skills by using textbooks and other sources (Internet, Library,..)	
	d5	write report with discussion in this subject.	
	d6	present independent investigative skills by using textbooks and other sources (Library,..)	
4-Contents	1	Introduction	
	2	Mechanism and methods of deeming.	
	3	Substitution reactions.	
	4	Addition reactions.	
	5	Rearrangement reactions.	
	6	Elimination reactions	
	7	Conformational analysis, proplems	
	8	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Practical.	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Avaliable.		
7-Student Assessment Methods					
a-Using Assessment					
b-Assessment Schedule					
c-Weighting of Assessments					
8-List of References					
a-Course notes		1	Notes written by Dept. stuff		
b-Essential Books(text books)		1	Guide Book to Mechanism In Organic Chemistry, Peter Sykes		
		2	Chemistry of Organic Reaction Mechanism Finar, volume 2,by Moreson &Boyed,2000		
		3	Organic chemistry, I.,L Finar, (volume 1),5th adition , Longman London,1982.		
c-Suggested Books		1	Finar, volume 2,by Moreson &Boyed,2000.		
d-Scientific periodicals or Publications		1	Chem. Web Site		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction	1	a1 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
2	Mechanism and methods of deeming.	2-3	a1 ,	b1 , b2 ,		d1 , d2 , d3 ,
3	Substitution reactions.	4-5	a1 , a2 ,	b1 , b2 ,	c3 , c4 ,	d2 , d3 ,
4	Addition reactions.	6-7	a1 , a2 ,	b2 ,	c2 , c3 ,	d1 , d3 ,



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5	Rearrangement reactions.	8-9	a1 , a2 ,	b1 , b2 ,	c4 ,	d1 , d3 ,
6	Elimination reactions	10-11	a1 , a2 ,	b1 , b2 ,	c2 , c4 ,	d1 , d2 , d3 ,
7	Conformational analysis, proplems	12-13	a1 , a2 ,	b1 , b2 ,	c4 ,	d2 , d3 ,
8	Revision	14				

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Stereochemistry+Alicyclic chemistry(1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C322	Title	Stereochemistry+Alicyclic chemistry(1)			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1		

2- Overall aims of the course

1	The overall aims of the study of this course is: Introduce the students to the fundamental of isomerism especially stereoisomerism, properties and resolution of racemic modifications, optical purity and correlations of sign and magnitude of rotation with absolute configuration. To familiarize the students with the basic concepts of alicyclic chemistry especially the monocyclic compounds, bicyclic compounds, and Spiro-compounds

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Know different types of isomerism and their properties
	a2	Know the meaning of stereoisomerism and its types
	a3	Describe the correlation of configurations.
	a4	Tell the number of isomers in optically active compound
	a5	Explain the racemic modification.
	a6	State the properties and Resolution of racemic modifications.
	a7	understand and outline the synthesis, nomenclature and reaction of alicyclic compounds.



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>Interpret the tetrahedral carbon atom and conformational analysis.</td></tr> <tr> <td>b2</td><td>Correlate between sign and magnitude of rotation with absolute configuration.</td></tr> <tr> <td>b3</td><td>evaluate the properties of different alicyclic compounds</td></tr> <tr> <td>b4</td><td>describe differences between and similarities of reactions of alicyclic compounds.</td></tr> </table>	b1	Interpret the tetrahedral carbon atom and conformational analysis.	b2	Correlate between sign and magnitude of rotation with absolute configuration.	b3	evaluate the properties of different alicyclic compounds	b4	describe differences between and similarities of reactions of alicyclic compounds.										
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c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>Determine the number of isomers in optically active compound.</td></tr> <tr> <td>c2</td><td>Perform optical purity on different compounds.</td></tr> <tr> <td>c3</td><td>Apply the basic concepts in the synthesis and nomenclature of new compounds with logic mechanistic pathway.</td></tr> </table>	c1	Determine the number of isomers in optically active compound.	c2	Perform optical purity on different compounds.	c3	Apply the basic concepts in the synthesis and nomenclature of new compounds with logic mechanistic pathway.												
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d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Communicate effectively with a wide range of individuals using a variety of means.</td></tr> <tr> <td>d2</td><td>Learn in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry</td></tr> <tr> <td>d3</td><td>Develop independent investigative skills by using textbooks and other sources (Library ...).</td></tr> <tr> <td>d4</td><td>Work effectively individually or as part of a team.</td></tr> <tr> <td>d5</td><td>Plan their work and meet deadlines</td></tr> </table>	d1	Communicate effectively with a wide range of individuals using a variety of means.	d2	Learn in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry	d3	Develop independent investigative skills by using textbooks and other sources (Library ...).	d4	Work effectively individually or as part of a team.	d5	Plan their work and meet deadlines								
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4-Contents	<table border="1"> <tr> <td>1</td><td>Introduction, Stereoisomerism, optical isomerism</td></tr> <tr> <td>2</td><td>The tetrahedral carbon atom, Conformational analysis.</td></tr> <tr> <td>3</td><td>Conventions used in stereochemistry.</td></tr> <tr> <td>4</td><td>Correlation of configurations.</td></tr> <tr> <td>5</td><td>Element of symmetry, molecular symmetry.</td></tr> <tr> <td>6</td><td>The number of isomers in optically active compound.</td></tr> <tr> <td>7</td><td>The racemic modification.</td></tr> <tr> <td>8</td><td>Properties and Resolution of racemic modifications.</td></tr> <tr> <td>9</td><td>Nomenclature Monocyclic compounds. Bicyclic compounds. Spiro compounds</td></tr> </table>	1	Introduction, Stereoisomerism, optical isomerism	2	The tetrahedral carbon atom, Conformational analysis.	3	Conventions used in stereochemistry.	4	Correlation of configurations.	5	Element of symmetry, molecular symmetry.	6	The number of isomers in optically active compound.	7	The racemic modification.	8	Properties and Resolution of racemic modifications.	9	Nomenclature Monocyclic compounds. Bicyclic compounds. Spiro compounds
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9	Nomenclature Monocyclic compounds. Bicyclic compounds. Spiro compounds																		



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	10	Synthesis Fround reaction,Perkin condensation. Diel's Alder reaction. From aromatic compounds. Condensation reactions	
	11	Reactions Halogenations.Reductions. Deme Janove reaction. Pinacol-Pincacoline reaction. Ring contractions.Ring expansions. Bayer theory. Diazomethane reactions	
	12	Revision	
5- Teaching and learning method	1	lecture	☒
	2	Discussion.	☐
	3	Practical.	☐
	4	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Hand out	
b-Essential Books(text books)	1	Organic chemistry, I., L Finar, (volume 2), 5th addition, Longman, London, 1985.	
c-Suggested Books	1	Organic Chemistry: The Fundamental principles" Volume 1: Sixth Edition	



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	2	Organic Chemistry (T.W. Graham Solomons & Craig B. Fryhle)
	3	Organic Chemistry Structure & Reactivity (Seyhan N. Ege)
	4	Organic Chemistry (George H. Schmid),
	5	Multiple Choice questions (R. Gopalan)
	6	Modern Organic Chemistry (Rodger W, Griffin)
	7	Organic Chemistry (Francis A. Carey)
	8	Modern Synthesis of Organic Synthesis (W. Carruthers)
	9	Reactions of Organic Compounds (Reynold C. Fuson)
	10	Organic Compounds by Graham Solomon's, 1995.
d-Scientific periodicals or Publications	1	Periodicals
	2	Web sites

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction, Stereoisomerism, optical isomerism	1	a4 ,	b4 ,	c3 ,	d3 ,
2	The tetrahedral carbon atom, Conformational analysis.	2	a4 ,	b4 ,	c3 ,	d3 , d4 ,
3	Conventions used in stereochemistry.	3	a4 , a6 ,	b4 ,		d4 ,
4	Correlation of configurations.	4	a5 , a6 ,		c3 ,	d3 , d4 ,
5	Element of symmetry, molecular symmetry.	5	a4 , a6 , a7 ,	b4 ,	c3 ,	d3 , d4 ,
6	The number of isomers in optically active compound.	6-8	a4 , a6 ,	b4 ,	c3 ,	d3 , d4 ,
7	The racemic modification.	9	a7 ,	b4 ,	c3 ,	d4 ,



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8	Properties and Resolution of racemic modifications.	10	a7 ,	b4 ,	c3 ,	d3 , d4 ,
9	Nomenclature Monocyclic compounds. Bicyclic compounds. Spiro compounds	1-5	a7 ,	b3 , b4 ,	c3 ,	d4 , d5 ,
10	Synthesis Fround reaction,Perkin condensation. Diel's Alder reaction. From aromatic compounds. Condensation reactions	6-8	a7 ,	b3 , b4 ,	c3 ,	d4 , d5 ,
11	Reactions Halogenations.Reductions. Deme Janove reaction. Pinacol-Pincacoline reaction. Ring contractions.Ring expansions. Bayer theory. Diazomethane reactions	9-13	a7 ,	b3 , b4 ,	c3 ,	d4 , d5 ,
12	Revision	14	a7 ,	b3 , b4 ,	c3 ,	d4 , d5 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For **Chemistry of d - block elements (B)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C331	Title	Chemistry of d - block elements (B)	Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1

2- Overall aims of the course

1	understand the physical properties of d-block elements
2	study the basic concepts of complexes.
3	study of coordination chemistry (theories and bonding): Valence bond theory (VBT), crystal field theory (CFT), ligand field theory (LFT), molecular orbital theory (MOT).
4	comparison between the four theories.
5	Applications in spectra and magnetism of coordination complexes.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	know the position of the elements in periodic table
	a2	understand the physical and chemical properties of d -block compounds.
	a3	explain the methods of elements extraction from their ores.
	a4	deduce the electronic configuration of the elements.
	a5	evaluate the magnetism of the metals in their compounds.



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>get informations about the important physical properties of d-block transition elements through a written report.</td></tr> <tr> <td>b2</td><td>conclude informations about the metal compounds through some exercises.</td></tr> <tr> <td>b3</td><td>have informations about the most oxidation states of metals.</td></tr> <tr> <td>b4</td><td>explain the extraction of metals.</td></tr> </table>	b1	get informations about the important physical properties of d-block transition elements through a written report.	b2	conclude informations about the metal compounds through some exercises.	b3	have informations about the most oxidation states of metals.	b4	explain the extraction of metals.										
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c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>conclude what is d-block element.</td></tr> <tr> <td>c2</td><td>write the methods of metal extraction.</td></tr> <tr> <td>c3</td><td>identify the properties and the chemical behavior of the d-block elements.</td></tr> </table>	c1	conclude what is d-block element.	c2	write the methods of metal extraction.	c3	identify the properties and the chemical behavior of the d-block elements.												
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d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Identify and criticize the properties and chemical behavior of metals.</td></tr> <tr> <td>d2</td><td>report on the investigated data of characterized spectroscopic and magnetic properties of the different metal compounds</td></tr> <tr> <td>d3</td><td>Identify the metal percent in its compounds.</td></tr> <tr> <td>d4</td><td>write a report</td></tr> <tr> <td>d5</td><td>Use textbooks and other sources (Library, websites)</td></tr> <tr> <td>d6</td><td>work effectively individually or as part of a team.</td></tr> <tr> <td>d7</td><td>plan their work and meet deadlines.</td></tr> </table>	d1	Identify and criticize the properties and chemical behavior of metals.	d2	report on the investigated data of characterized spectroscopic and magnetic properties of the different metal compounds	d3	Identify the metal percent in its compounds.	d4	write a report	d5	Use textbooks and other sources (Library, websites)	d6	work effectively individually or as part of a team.	d7	plan their work and meet deadlines.				
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4-Contents	<table border="1"> <tr> <td>1</td><td>-Site of transition elements in the periodic table. -The first, second and third transition elements.</td></tr> <tr> <td>2</td><td>-The difference between d-block elements. -The characteristic properties of the first series of d-block transition elements. -The magnetic properties of d-block transition elements.</td></tr> <tr> <td>3</td><td>- A comparison between the properties of the 4d and 5d elements with the corresponding 3d elements in the same group.</td></tr> <tr> <td>4</td><td>Their occurrence, electronic configuration, oxidation states and lanthanide contraction</td></tr> <tr> <td>5</td><td>Study of spectroscopic and magnetic properties.</td></tr> <tr> <td>6</td><td>First transition subgroup.</td></tr> <tr> <td>7</td><td>Second transition subgroup.</td></tr> <tr> <td>8</td><td>Third transition subgroup</td></tr> <tr> <td>9</td><td>fourth transition subgroup</td></tr> </table>	1	-Site of transition elements in the periodic table. -The first, second and third transition elements.	2	-The difference between d-block elements. -The characteristic properties of the first series of d-block transition elements. -The magnetic properties of d-block transition elements.	3	- A comparison between the properties of the 4d and 5d elements with the corresponding 3d elements in the same group.	4	Their occurrence, electronic configuration, oxidation states and lanthanide contraction	5	Study of spectroscopic and magnetic properties.	6	First transition subgroup.	7	Second transition subgroup.	8	Third transition subgroup	9	fourth transition subgroup
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	10	fifth transition subgroup		
	11	Iron subgroup and the Platinum metals		
	12	Group (IB) elements		
5- Teaching and learning method	1	lecture	☐	
	2	Open Discussion.	☐	
	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Mid- term exam		
	3	Oral exam		
b-Assessment Schedule	1	Final written exam	15	
	2	Mid- term exam	8	
	3	Oral exam	14	
c-Weighting of Assessments	1	Final written exam	20	80.00%
	2	Mid- term exam	2.5	10.00%
	3	Oral exam	2.5	10.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part		
b-Essential Books(text books)	1	Inorganic Chemistry, Alan G. Sharpe, 3rd Edition,1992.		
	2	Basic Inorganic Chemistry for F. Albert Cotton		
	3	General Chemistry for Ebbing Approach, S.F.A. Kettle, Spektrum, 1996.		



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c-Suggested Books	
d-Scientific periodicals or Publications	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	-Site of transition elements in the periodic table. -The first, second and third transition elements.	1	a1 ,		c1 ,	d4 , d5 , d6 , d7 ,
2	-The difference between d-block elements. -The characteristic properties of the first series of d-block transition elements. -The magnetic properties of d-block transition elements.	2,3	a2 , a5 ,	b1 , b2 ,	c1 , c3 ,	d2 , d4 , d5 , d6 , d7 ,
3	- A comparison between the properties of the 4d and 5d elements with the corresponding 3d elements in the same group.	4	a2 , a3 , a5 ,	b1 , b2 ,	c1 , c3 ,	d2 , d4 , d5 , d6 , d7 ,
4	Their occurrence, electronic configuration, oxidation states and lanthanide contraction	5,6	a3 , a4 ,	b1 , b4 ,	c2 , c3 ,	d1 , d3 , d4 , d5 , d6 , d7 ,
5	Study of spectroscopic and magnetic properties.	7	a1 , a2 , a3 , a5 ,	b1 ,	c3 ,	d1 , d2 , d3 , d5 , d6 , d7 ,
6	First transition subgroup.	8	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
7	Second transition subgroup.	9	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,



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8	Third transition subgroup	10	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
9	fourth transition subgroup	11	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
10	fifth transition subgroup	12	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
11	Iron subgroup and the Platinum metals	13	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
12	Group (IB) elements	14	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,

Course Coordinator Prof. Dr.

Samir Mostafa El-Medani.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Faculty of Science



Course Specification For **Electrochemistry(1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C341	Title	Electrochemistry(1)		Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	Provide students with the opportunities to develop an interdisciplinary understanding of the heat of solution concepts.
2	Enable students to acquire the intellectual skills necessary to handle subject- specific theory, information and issues.
3	Support the student's development of a wide-range of subject-specific and generic practical and transferable skills.
4	Allow the student to understand the role of reversible and irreversible process in different application of voltaic and Electrolysis cells.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate the main Knowledge and curves.
	a2	Describe methods to measure the emf, of the cell.
	a3	Illustrate the types of the half cells and cells.
	a4	Know the types of practical galvanic cells
	a5	Know the relation between potential and concentration



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Conclude the information from both lectures and library.
	b2	Perform some exercises to apply the studied laws in course
	b3	Compare between the types of electrodes and cells.
	b4	Determine the emf of the cell and the relation between potential of electrode and concentration.
	b5	Differentiate between different practical galvanic cells
	b6	Differentiate between spontaneous and non spontaneous reaction
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Design some electric circuits and Perform the emf of the cell.
	c2	Solve different problems related to potential of electrodes.
	c3	Dissect the difference between the types of electrodes and over potentials.
	c4	calculate the emf of galvanic cell and knowing the electrochemical reactions of cell.
	c5	differentiate between the different cells.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Discuss the types of electrodes
	d2	(Oral) present report in seminar
	d3	Write a report.
	d4	Use the computer
	d5	Communicate with topics and internet
	d6	Solve problem
	d7	Work in a team
4-Contents	1	Introduction, half-cell potential, Galvanic cells, the Daniel's cell , measurements of EMF, standard Weston cell.
	2	Effect of concentration, pressure, and temperature on the EMF, Electrode potential and Nernst equation
	3	Standard electrode potentials and electromotive series.
	4	Types of half-cells. Problems.
	5	Concentration cells. Examples
	6	Uses of EMF of measurements
	7	problems
	8	Practical galvanic cells.



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	9	Revision		
	10	Energy Barrier		
5- Teaching and learning method	1	lecture	☐	
	2	Discussion.	☐	
	3	Practical.	☐	
	4	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final term examination	to assess student's ability in understanding the concepts discussed in the courses	
	2	Mid term examination		
	3	Oral examination		
b-Assessment Schedule	1	Final term examination	15	
	2	Mid term examination	8	
	3	Oral examination	10	
c-Weighting of Assessments	1	Final term examination	20	80.00%
	2	Mid term examination	2.5	10.00%
	3	Oral examination	2.5	10.00%
8-List of References				
a-Course notes	1	Course Notes written by Dept. stuff		
b-Essential Books(text books)	1	R. A. Alberty, "physical Chemistry" 7th Ed. John Wiley & Sons 1992.		
	2	W. J. Moore "Physical Chemistry"; Prentice-Hall, 1983.		
c-Suggested Books	1	"Physical chemistry" in the library.		



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d-Scientific periodicals or Publications	1 Library - Web sites en.wikipedia.org/wiki/Electrochemistry

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction, half-cell potential, Galvanic cells, the Daniel's cell , measurements of EMF, standard Weston cell.	1,2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
2	Effect of concentration, pressure, and temperature on the EMF, Electrode potential and Nernst equation	3,4	a1 , a2 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 ,	d2 , d3 ,
3	Standard electrode potentials and electromotive series.	5,6	a4 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d3 ,
4	Types of half-cells. Problems.	7,8	a3 ,	b1 , b2 ,	c3 ,	d1 , d4 ,
5	Concentration cells. Examples	9,10	a2 ,	b2 , b4 ,	c1 , c2 , c5 ,	d1 , d5 , d6 ,
6	Uses of EMF of measurements	11	a1 , a4 ,	b1 , b4 , b5 ,	c4 ,	
7	problems	12	a1 , a5 ,	b1 , b6 ,	c1 , c3 ,	d2 , d6 ,
8	Practical galvanic cells.	13	a5 ,	b1 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d4 ,
9	Revision	14	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 ,
10	Energy Barrier	11	a1 , a2 ,	b1 , b2 ,	c1 , c2 , c3 ,	d3 ,

Course Coordinator Prof. Dr. Nadia Helal Yehia

Program Coordinator Prof. Dr. Ehab Moaz Abouzied



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Faculty of Science



Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Kinetic Chemistry (1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C346	Title	Kinetic Chemistry (1)			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Understand the main concepts
2	Know the difference between molecularity and order of reaction.
3	study the factors affect the rate of reactions
4	Study the order of reaction
5	Study mechanism of reaction.
6	Determine the rate of reaction
7	Solve problems

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain the main knowledges and curves
	a2	know the factors affect the rate of reactions
	a3	differentiate between molecularity and order of reaction
	a4	Calculate the rate of reaction
	a5	List the orders of reaction
	a6	State the theories of reaction rates.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Correlate the information from both lectures and library	
	b2	Perform some exercises to apply the studied laws in course	
	b3	Analyze some phenomena in lab	
	b4	Determine the factors affect on reaction	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Determine the order of reaction.	
	c2	Study the factors affect on the reaction rates..	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Discuss the order of reaction and molecularity	
	d3	Determine the order of reaction	
	d4	Knowing the factors effect on the reaction.	
	d5	write a report.	
	d6	solve different problem	
	d7	work in team	
	d8	Communicate with topics and internet	
4-Contents	1	Chemical kinetic concepts and reaction rate. Unites of rate. Order of reaction and molecularity.	
	2	Factors affecting reaction rate Physical state, Concentration Temperature, Catalysts	
	3	Pseudo-order reactions, zero order reaction. First order reactions, examples, half- life period of first order reaction.	
	4	Second –order reactions (a=b) and (a#b). Half–life period of second-order, examples, problems	
	5	Third –order reaction, simple case (a=b=c) and half life period. Problems	
	6	Determination of order of reaction, method of integration, graphing, the half life method and Oswald's isolation method.	
	7	collision theory of chemical reactions, problems.	
	8	the transition state theory, examples and problems	
	9	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Homework.	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Mid- term exam		
	3	Oral Exam.		
	4	Practical exam.		
b-Assessment Schedule	1	Final written exam	15	
	2	Mid- term exam	8	
	3	Oral Exam.	10	
	4	Practical exam.	14	
c-Weighting of Assessments	1	Final written exam	35	70.00%
	2	Mid- term exam	2.5	5.00%
	3	Oral Exam.	2.5	5.00%
	4	Practical exam.	10	20.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part.		
b-Essential Books(text books)	1	Essential physical chemistry , B.S Bahl		
c-Suggested Books	1	"Physical chemistry" in the library.		
d-Scientific periodicals or Publications	1	Library		
	2	Web sitesen.wikipedia.org/wiki/kinetic		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Chemical kinetic concepts	1	a1 ,	b1 ,	c1 ,	d1 , d2 , d4 ,



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	and reaction rate. Unites of rate. Order of reaction and molecularity.					
2	Factors affecting reaction rate Physical state, Concentration Temperature, Catalysts	2	a1 , a2 , a3 ,	b1 , b2 , b4 ,	c1 ,	d1 , d2 ,
3	Pseudo-order reactions, zero order reaction. First order reactions, examples, half-life period of first order reaction.	3,4	a3 ,	b2 ,	c1 ,	d2 , d3 ,
4	Second –order reactions (a=b) and (a≠b). Half–life period of second-order, examples, problems	5,6	a1 , a3 ,	b2 ,	c1 , c2 ,	d1
5	Third –order reaction, simple case (a=b=c) and half life period. Problems	7,8	a3 ,	b1 ,	c2 ,	d2 , d3 , d4
6	Determination of order of reaction, method of integration, graphing, the half life method and Oswald's isolation method.	9,10	a1 ,	b1, b2	c2 ,	d4 ,d6
7	collision theory of chemical reactions, problems.	11,12	a6	b1	c1	d1 , d2 , d3 , d4 ,
8	the transition state theory, examples and problems	13,14	a6	b1	c1	d1,d2,d3,d4
9	Revision	14	a1,a2,a3,a4,a5,a6	b1,b2,b3,b4	c1,c2	d1,d2,d3,d4, d5,d6,d7 d8 ,

Course Coordinator Prof. Dr. **Nadia Helal Yehia**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



THIRD LEVEL

SECOND SEMESTER



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Course Specification For

Histotechnique

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z322	Title	Histotechnique			Level	3	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	acquire recent knowledge and techniques in the field of histotechniques.
2	deal with stains and integrate professional histotechniques skills and equipments.
3	handle modern histochemical techniques for different tissues.
4	describe the histological components of the animal tissues.
5	correlate between the structure & functions of various normal tissues under light microscope & electron micrograph.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	demonstrate fundamental concepts, principals, terminology associated with Histotechniques.
	a2	discuss the best method for tissue examination
	a3	relate the relationships between the structure and function of tissue.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	interpret components of different tissues	
	b2	summarize a proper technique for tissue	
	b3	access the different precautions for histotechniques.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	prepare different types of chemical fixatives.	
	c2	use different tools and techniques e.g. cryostat, microtome, ...etc	
	c3	practice preparation and staining steps of slides.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	acquire the ability for self and continuous professional learning.	
	d2	work independently or as part of team, and communicate with others positively.	
	d3	Apply the basic principals in the field.	
	d4	build up the presentation skills.	
4-Contents	1	Introduction, Overview of course & its importance Materials and Equipment (Tools or Instruments), Animal models	
	2	Anesthesia (narcotization), sacrificing, obtaining blood, saline for washing & gross examination. Fixation (Advantages & Disadvantages), types & Post-fixation.	
	3	Decalcification, Storing specimens, Dehydration, Clearing.- Infiltration, Embedding (paraffin, celloidin)+artifacts, Casting.	
	4	Sectioning, +artifacts +microtomes, Mounting & Mountants. Staining, Stains, special stains & how it work	
	5	H&E, Triple staining. Cleaning, Labeling, and Storing Slides *Light Microscopy different types and Animal Microtechniques	
	6	TEM and Techniques SEM and Techniques Whole preparations (wet, dry, stained, unstained Preparations (Permanent, Temporary)	
	7	General Laboratory Aids & Principles of solution preparation.	
5- Teaching and learning method	1	lecture (using power point presentation & blackboard)	✓
	2	Seminars & presentation	✓
	3	Practical	✓
	4	Homework & online search	✓



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written.		
	2	Practical exam		
	3	Sheet (oral or written).		
	4	Mid- term exam		
b-Assessment Schedule	1	Final written.	15	
	2	Practical exam	13	
	3	Sheet (oral or written).	13	
	4	Mid- term exam	8	
c-Weighting of Assessments	1	Final written.	35	70.00%
	2	Practical exam	10	20.00%
	3	Sheet (oral or written).	2.5	5.00%
	4	Mid- term exam	2.5	5.00%
8-List of References				
a-Course notes	1	Lecture Notes in Histotechniques (Theoretical & Practical)		
b-Essential Books(text books)	1	Drury, R.A. and E.A. Wallington, 1980.		
	2	Carleton'sHistological technique" 5th Ed. published by Oxford University press. London, New York,Toronto.		
	3	Horbin,R.W.(1992) : Histochemiatry. An explanatory. Outline of Histochemistry and Biophysical Staining .Butterworth London.		
c-Suggested Books	1	Junqueira L. C. Carneiro J.(2005) : Basic Histology - Text and Atlas 11th edition Mc Graw Hill Lange.		
	2	البنهاوى محمود احمد و الجنزورى منير على (١٩٨٩): التقنية المجهرية اعداد التحضيرات الميكروسكوبية- الطبعة الاولى- - دار المعارف - ج م ع.		
	3	البنهاوى محمود احمد و خطاب فهمى ابراهيم و الجنزورى منير على (١٩٩٩):اسس كيمياء الأنسجة- المكتبة الأكاديمية - ج م ع.		



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	4	الطيب نوري بن طاهرو جرار بشير محمود (٢٠٠٩): اساسيات علم كيمياء الانسجة. جامعة الملك سعود الرياض .
	5	جراى بيتر (١٩٩٤) اساسيات التقنية الدقيقة –ترجمة الشعلان عمت موجد البارونى محمد ابو مرداس والباهى رافع محمد - الطبعة الأولى –جامعة عمر المختار -ليبيا.
d-Scientific periodicals or Publications	1	Cell and histology Journals/ Histochemistry and Cytochemistry Journals/ Histochemistry and Cell Biology Journal/ http://www.ncbi.nlm.nih.gov ,
	2	http://www.sciencedirect.com
	3	http://library.med.utah.edu/WebPath/HISTHTML/HISTOTCH/HISTOTCH.html
	4	http://www.leicabiosystems.com/pathologyleaders/fixation-and-fixatives-1-the-process-of-fixation-and-the-nature-of-fixatives/
	5	http://www.leicabiosystems.com/pathologyleaders/fixation-and-fixatives-2-factors-influencing-chemical-fixation-formaldehyde-and-glutaraldehyde/
	6	http://www.leicabiosystems.com/pathologyleaders/knife-angle-in-microtomy/
	7	http://www.leicabiosystems.com/pathologyleaders/sacrifice-perfusion-in-animal-research/
	8	https://www.youtube.com/watch?v=38PRk2gowow

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction, Overview of course & its importance Materials and Equipment (Tools or Instruments), Animal models	1,2	a1 ,	b1 ,	c1 ,	d1 ,



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2	Anesthesia (narcotization), sacrificing, obtaining blood, saline for washing & gross examination. Fixation (Advantages & Disadvantages), types & Post-fixation.	3,4	a3 ,	b2 ,	c2 ,	d3 ,
3	Decalcification, Storing specimens, Dehydration, Clearing.- Infiltration, Embedding (paraffin, celloidin)+artifacts, Casting.	5,6	a2 ,	b3 ,	c1 , c2 ,	d3 ,
4	Sectioning, +artifacts +microtomes, Mounting & Mountants. Staining, Stains, special stains & how it work	7,8	a2 ,	b1 ,	c2 ,	d4 ,
5	H&E, Triple staining. Cleaning, Labeling, and Storing Slides *Light Microscopy different types and Animal Microtechniques	9,10	a3 ,	b2 ,	c1 , c2 ,	d3 ,
6	TEM and Techniques SEM and Techniques Whole preparations (wet, dry, stained, unstained Preparations (Permanent, Temporary)	11,12	a2 ,	b1 ,	c2 , c3 ,	d1 ,
7	General Laboratory Aids & Principles of solution preparation.	13,14	a1 ,	b3 ,	c2 ,	d4 ,

Course Coordinator Prof. Dr. **Mohamed Wasim Mohamed Khalil**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Descriptive Embryology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z341	Title	Descriptive Embryology			Level	3	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course is designed to acquire students with basic knowledge of Embryology and stages of development of the embryo.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Distinguish between different stages of embryological process.
	a2	Determine various structures and their changes through development
	a3	Understand patterns of genetic layers and their contribution in development of organs.
	a4	Recall the knowledge regarding latest developments in vertebrate embryology.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify properties and structure of Gametogenesis. Spermatogenesis and Spermiogenesis and Oogenesis
	b2	Describe types and classification of eggs in vertebrates
	b3	Discuss hormonal control of gametogenesis
	b4	Understand Cleavage. Patterns of cleavage, Cleavage pattern in some vertebrates.



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	b5	Describe gastrulation, formation of the genetic layers. Gastrulation pattern in some vertebrates and Organogenesis
	b6	Explain latest developments in vertebrate embryology
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Examine and analyse embryonic slides
	c2	Demonstrate different stages of embryonic development in protochordate, Amphibian and Aves embryo
	c3	Examine neurulation formation in embryo
	c4	Apply knowledge to comment on a specific experiment
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team to collect specific information
	d2	Use information and communication technology effectively to restore embryonic information.
	d3	Ability to discuss finding and present it.
	d4	Work in groups effectively; manage time, collaborate and communicate with others positively.
	d5	Consider community linked problems, ethics and traditions.
	d6	Acquire self- and long life-learning.
	d7	Apply scientific models, systems, and tools effectively.
4-Contents	1	Introduction of Embryology, Terms and concepts, Primordial Germ cells, Gonads early formation Gametogenesis, Spermatogenesis and Spermiogenesis, Oogenesis, Hormonal control of Gametogenesis.
	2	Fertilization, Cleavage. Patterns of cleavage, Cleavage pattern in some vertebrates, Gastrulation, Formation of the genetic layers, Gastrulation pattern in some vertebrates,
	3	Cellular basis of Morphogenesis Morphogenesis of 3 and 10mm frog embryo
	4	Organs Formed by The Ectoderm Layer: Neural System, Pituitary Gland, Sense Organs (The Eye).
	5	Organs Formed by The Mesoderm Layer: Urinary and Genital System, Circular and Vascular System, Organs Formed by The Endoderm Layer: Digestive System.
	6	Practical Exam
	7	Final Exam
5- Teaching and learning method	1	In-class Lecturing (using PowerPoint presentation and illustrations)



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	2	Discussion.	☐	
	3	Encouraging students to submit activities, assignments, writing reports and presenting them.	☐	
	4	DVD videos and animations	☐	
	5	Study tips and Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-term Examination	8	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Final-term Examination	55	73.33%
	2	Mid-term Examination	2.5	3.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%



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8-List of References		
a-Course notes		
b-Essential Books(text books)	1	Gilbert 7th. ed., Development Biology
c-Suggested Books		
d-Scientific periodicals or Publications	1	library Periodicals
	2	Web sites

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction of Embryology, Terms and concepts, Primordial Germ cells, Gonads early formation Gametogenesis, Spermatogenesis and Spermiogenesis, Oogenesis, Hormonal control of Gametogenesis.	1-4	a1 ,	b1 , b3 ,	c4 ,	d1 , d2 , d6 ,
2	Fertilization, Cleavage. Patterns of cleavage, Cleavage pattern in some vertebrates, Gastrulation, Formation of the genetic layers, Gastrulation pattern in some vertebrates,	5-8	a1, a2, a4	b2, b4, b5, b6	c1,	d2, d3, d6
3	Cellular basis of Morphogenesis Morphogenesis of 3 and 10mm frog embryo	9	a2 , a4 ,	b5 , b6 ,	c3 ,	d1 , d2 , d6 ,



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4	Organs Formed by The Ectoderm Layer: Neural System, Pituitary Gland, Sense Organs (The Eye).	10, 11	a2 , a4 ,	b5 ,	c2 ,	d1 , d3 , d7 ,
5	Organs Formed by The Mesoderm Layer: Urinary and Genital System, Circular and Vascular System, Organs Formed by The Endoderm Layer: Digestive System.	12-14		b5 ,	c4 ,	d1 , d2 , d3 , d7 ,
6	Practical Exam	14				
7	Final Exam	15				

Course Coordinator Prof. Dr. **Ahmed Ali Kandeel**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Potozoa and Parasites**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z331	Title	Potozoa and Parasites			Level	3	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Introducing the principles of invertebrates.
2	Recognizing the classification of invertebrates.
3	Treaning and handling of examples from different species of invertebrate

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	define general classification of invertebrate parasites
	a2	explain different types of life cycles
	a3	mention ultra structure details of different parasitic species
	a4	understand mechanism of infections
	a5	explain the mechanisms of protection or decrease of infestation by parasites
b- Intellectual skills: At the end of the course the student should be able to:	b1	clarify general systematic of different parasitic groups.
	b2	compare between different genera of parasites
	b3	deduce the mechanism of infection
	b4	interpret phenomena and effects in term of parasitological principles, presenting arguments and ideas clearly and logically..



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	collect samples for investigation	
	c2	preserve samples for identification	
	c3	separate different parasitic species	
	c4	analyses and estimate each constituents	
	c5	dissect animals for finding parasites	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Learn how to search for an information using the library or internet. resources.	
	d2	work in groups	
	d3	learn time management	
	d4	present oral or written essay using appropriate language.	
	d5	training for prevention of infection	
	d6	training for safety handling of parasites	
4-Contents	1	Introduction and general characters of parasitic invertebrate	
	2	General classification and structure of protozoa with explain the host-parasite relations	
	3	General classification and structure of parasites with explain the host-parasite relations	
	4	Studies the morphology and life cycle,pathogenicity and diagnosis of some examples of protozoa, helminthes and its vectors	
	5	studies the economic importance of some species	
5- Teaching and learning method	1	lecture	☒
	2	Discussion	☒
	3	Practical	☒
	4	Homework	☒
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final written	
	2	Practical exam	
	3	Sheet (oral or written)	



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	4	Mid- term exam		
b-Assessment Schedule	1	Final written	15	
	2	Practical exam	13	
	3	Sheet (oral or written)	13	
	4	Mid- term exam	8	
c-Weighting of Assessments	1	Final written	35	70.00%
	2	Practical exam	10	20.00%
	3	Sheet (oral or written)	2.5	5.00%
	4	Mid- term exam	2.5	5.00%
8-List of References				
a-Course notes	1	Hand out		
	2	General Notes by Staff members of Zoology Department .		
b-Essential Books(text books)	1	Parasitology in focus.(2000): Book of parasitology, ED. H. Mehlhorn.		
	2	Invertebrates of Mediterranean see ED. G.N. Soliman		
	3	parasite of fish in north africa (2012), Dayhoum A. M. Al-Bassel		
c-Suggested Books	1	Introduction to animal parasitology (1982) J.D. Smyth		
d-Scientific periodicals or Publications	1	www.sciencedirect.com		
	2	www.pubmed.com		
	3	www.google.com		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Intoduction and general characters of parasitic invertebrate	1,2	a1 ,	b1 ,	c1 ,	d1 ,



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2	General classification and structure of protozoa with explaine the host-parasite relations	3-9	a2 ,	b2 ,	c2 ,	d2 , d5 , d6 ,
3	General classification and structure of parasites with explaine the host-parasite relations	10-12	a3 , a4 ,	b3 ,	c3 ,	d3 , d5 , d6 ,
4	Studies the morphology and life cycle,pathogenicity and diagnosis of some examples of protozoa, helminthes and its vectors	13	a3 , a4 , a5 ,	b4 ,	c4 , c5 ,	d4 , d5 , d6 ,
5	studies he economic importance of some species	14	a2 , a3 , a5 ,	b4 ,	c4 , c5 ,	d4 , d5 , d6 ,

Course Coordinator Prof. Dr. Dayhoum Al-Bassel

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Heterocyclic Chemistry (1-A)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C323	Title	Heterocyclic Chemistry (1-A)			Level	3	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	Understand the basic concepts of heterocyclic compounds.
2	Qualifying the students to synthesize different types of heterocycles.
3	Demonstrate different reactions of heterocyclic and aromatic compounds.
4	To introduce the students to the basics of heterocyclics in chemistry. Then use this as basis to approach compounds both in industry and biologically

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	understand the theory of aromaticity
	a2	list the classification of heterocyclic compounds.
	a3	Know the synthesis and reactions of heterocyclic and aromatic compounds
b- Intellectual skills: At the end of the course the student should be able to:	b1	identify the aromatic character
	b2	compare between basics of heterocyclic
	b3	formulate different starting materials in the synthesis of different types of heterocycles.



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	b4	analyze the mechanism of electrophilic and nucleophilic substitution reactions of aromatics	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	self learning	
	c2	syntresize different types of heterocyclic	
d-General and transferable skills: At the end of the course the student should be able to:	d1	write a report.	
	d2	Discuss different chemical synthesize behaviors of aromatic, carbohydrate and heterocyclic compounds.	
	d3	develop independent investigative skills by using textbooks and other sources (Library,...)	
	d4	work effectively individually or as part of a team.	
	d5	utilize problem solving skills in a variety of theoretical and practical situations	
	d6	plan their work and meet deadlines	
	d7	collect, record, analyze and interpret data from a range of sources.	
	d8	use information technology applications	
	d9	make report with discussion in this subject	
4-Contents	1	Introduction	
	2	Aromaticity and Classification of heterocyclic compounds	
	3	Nomenclature of heterocyclic compounds	
	4	Five membered heterocyclic rings	
	5	Six membered heterocyclic rings	
	6	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.		
7-Student Assessment Methods					
a-Using Assessment					
b-Assessment Schedule					
c-Weighting of Assessments					
8-List of References					
a-Course notes		1	Course notes Notes Written by Dept. stuff		
b-Essential Books(text books)		1	Organic chemistry, I.,L Finar, (volume 1),5th addition , Longman, London,1982. Guide Book to Mechanism In Organic Chemistry, Peter Sykes.		
c-Suggested Books		1	Organic Compounds by Graham Solomon's, 1995.		
d-Scientific periodicals or Publications		1	Chem. Web Site		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction	1-2	a1 ,	b1 , b2 ,	c1 , c2 ,	d1 ,
2	Aromaticity and Classification of heterocyclic compounds	3-6	a2 , a3 ,	b1 ,	c1 , c2 ,	d1 , d2 ,
3	Nomenclature of heterocyclic compounds	7-8	a2 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
4	Five membered heterocyclic rings	9-10	a2 , a3 ,	b3 , b4 ,	c1 , c2 ,	d1 , d2 ,



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5	Six membered heterocyclic rings	11-13	a2 , a3 ,	b3 , b4 ,	c1 , c2 ,	d1 , d2 ,
6	Revision	14				

Course Coordinator Prof. Dr. Mamdouh Taha

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

Coordination Chemistry & f- block elements (1)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C333	Title	Coordination Chemistry & f- block elements (1)	Level	3	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1

2- Overall aims of the course

1	understand the physical properties of d-block elements.
2	know the basic concepts of complexes.
3	Understand coordination chemistry (theories and bonding): Valence bond theory (VBT), crystal field theory (CFT), ligand field theory (LFT), molecular orbital theory (MOT).
4	compare between the four theories.
5	Study applications in spectra and magnetism of coordination complexes.
6	define and study f-block elements.
7	give the famous ores of the elements and methods of extraction.
8	conclude the electronic configuration of the elements.
9	study of the spectroscopic and magnetic properties of the elements
10	understand the physical and chemical properties of f-block compounds.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	List the physical and chemical properties of f-block elements.
	a2	explain the methods of elements extraction from their ores.
	a3	deduce the electronic configuration of the elements.
	a4	Recognize the magnetism of the metals in their compounds.
	a5	know the types and properties of ligands and complexes.
	a6	explain the bonding in metal complexes.
	a7	nomenclature of metal complexes.
	a8	differentiate between theories of bonding in metal
b- Intellectual skills: At the end of the course the student should be able to:	b1	get informations about the trend in the most important physical properties of d-block transition elements through a written report.
	b2	conclude informations about the metal complexes through some exercises.
	b3	get informations about the important physical properties of f-block transition elements through a written report.
	b4	conclude informations about the metal compounds through some exercises.
	b5	explain the extraction of metals.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	predict the geometry of any metal complex.
	c2	calculate the magnetism of metal complexes.
	c3	compare between weak and strong field complexes.
	c4	write what the meaning of f-block elements.
	c5	write the methods of metal extraction.
	c6	identify the properties and the chemical behavior of f-block elements.
d-General and transferable skills: At the end of the course the student should be able to:	d1	study the different types of ligands.
	d2	discuss and characterize the different types of metal complexes
	d3	study the properties and chemical behavior of metals.
	d4	discuss and characterize the spectroscopic and magnetic properties of the different metal compounds.
	d5	locate the metal percent in its compounds.
	d6	write a report .
	d7	work effectively individually or as part of a team.



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4-Contents	1	-Properties trends in d-block transition metals, report. -Definition of ligands, types of ligands and chelate effect, formation of transition metal complexes, coordination number of metals in complexes.
	2	Brief study on Werner Coordination Theory, nomenclature of the most published metal complexes, effective atomic number (EAN) rule, report.
	3	Brief study on Valence Bond Theory (VBT), application of Valence Bond Theory of different types of metal complexes, explanation of (VBT) to weak and strong field metal complexes, advantages and disadvantages of VBT, exercises.
	4	Brief account about Crystal Field Theory (CFT), effect of an octahedral field on d-orbitals, high and low spin octahedral metal complexes, factors affecting crystal field splitting energy ($10Dq$), report.
	5	Crystal field stabilization energy (CFSE), distorted octahedral complexes, effect of a tetrahedral field on d orbitals, effect of a square planar field on d orbitals, brief study on the Visible spectra of transition metal complexes, brief account on the lake in CFT, report.
	6	Molecular Orbital Theory (MOT), application of MOT on octahedral complexes, explanation of MOT to π bonding in octahedral complexes, effect of π bonding on the field strength of complexes.
	7	- Definition of lanthanide and actinide elements. -The difference between d and f-block elements.
	8	--Study of the lanthanide and actinide elements, a comparison between lanthanides and actinides with scandium group elements in terms of their occurrence, electronic configuration, oxidation states and lanthanide contraction.
	9	Study of spectroscopic and magnetic properties, the difference between 4f & 5f levels and their effect on the chemical behaviour.



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5- Teaching and learning method	
6- Teaching and learning methods for students with limited capacity	Not Available.
7-Student Assessment Methods	
a-Using Assessment	
b-Assessment Schedule	
c-Weighting of Assessments	
8-List of References	
a-Course notes	
b-Essential Books(text books)	
c-Suggested Books	
d-Scientific periodicals or Publications	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	-Properties trends in d-block transition metals, report. -Definition of ligands, types of ligands and chelate effect, formation of transition metal complexes, coordination number of metals in complexes.	1	a5 , a6 ,	b1 , b2 ,	c2 ,	d1 , d2 , d3 ,



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2	Brief study on Werner Coordination Theory, nomenclature of the most published metal complexes, effective atomic number (EAN) rule, report.	2-3	a6 , a7 ,	b2 ,	c1 ,	d1 , d2 ,
3	Brief study on Valence Bond Theory (VBT), application of Valence Bond Theory of different types of metal complexes, explanation of (VBT) to weak and strong field metal complexes, advantages and disadvantages of VBT, exercises.	4	a2 , a4 , a5 ,	b2 ,	c1 ,	d2 ,
4	Brief account about Crystal Field Theory (CFT), effect of an octahedral field on d-orbitals, high and low spin octahedral metal complexes, factors affecting crystal field splitting energy (10Dq), report.	5	a2 , a3 , a5 ,	b2 ,	c1 , c3 ,	d2 , d3 ,
5	Crystal field stabilization energy (CFSE), distorted octahedral complexes, effect of a tetrahedral field on d orbitals, effect of a square planar field on d orbitals, brief study on the Visible spectra of transition metal complexes, brief account on the lake in CFT, report.	6	a2 , a3 , a4 , a5 ,	b2 ,	c1 , c2 , c3 ,	d2 , d3 ,



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6	Molecular Orbital Theory (MOT), application of MOT on octahedral complexes, explanation of MOT to π bonding in octahedral complexes, effect of π bonding on the field strength of complexes.	7	a2 , a3 , a4 , a5 , a7 ,	b2 ,	c1 , c2 , c3 ,	d2 , d3 , d5 ,
7	- Definition of lanthanide and actinide elements. -The difference between d and f-block elements.	9	a1 , a5 ,	b1 , b2 , b3 ,	c1 , c3 ,	d1 , d2 , d4 , d5 , d6 , d7
8	--Study of the lanthanide and actinide elements, a comparison between lanthanides and actinides with scandium group elements in terms of their occurrence, electronic configuration, oxidation states and lanthanide contraction.	10,11	a1 , a2 , a4 ,	b1 , b2 , b3 , b4 ,	c3 ,	d4 , d5 , d6 , d7
9	Study of spectroscopic and magnetic properties, the difference between 4f & 5f levels and their effect on the chemical behaviour.	12,13	a1 , a2 , a5 ,	b1 , b2 ,	c3 ,	d4 , d5 , d6 , d7 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For **Instrumental analysis**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C352	Title	Instrumental analysis		Level	3	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3	

2- Overall aims of the course

1	Build a solid foundation to be followed on the course and understanding the concept of Chromatographic analysis.
2	Understand the main concepts for separation mechanism
3	differentiate between the general remarks of each various kinds of chromatographic analysis
4	Understand the definitions of chromatographic terms.
5	Understand the properties of the elution techniques.
6	Understand the theories of chromatographic development.
7	Classify the different types of chromatography

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Write the principle of chromatography , the types of stationary and mobile phases, modes of interaction with matter .
	a2	Explain the theoretical principles of different types of Chromatographic analysis .
	a3	Write the different methods of column and planner thin-layer chromatography.



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	a4	Discuss the importance of HPLC plumbing
	a5	Explain the HPLC techniques that utilizes affinity chromatography properties
	a6	Get knowledge for the role of electrophoresis in the separation of biochemical analytes.
	a7	Get knowledge for the role how quantitative analysis is assessed from HPLC data
b- Intellectual skills: At the end of the course the student should be able to:	b1	Record information and data from the libraries .
	b2	Compare between adsorption, partition, ion-exchanges and size exclusion chromatography.
	b3	Compare between gas and liquid chromatography.
	b4	Evaluate advantages and disadvantages of the various GC and HPLC detectors
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Gain access to information from the library and internet .
	c2	Show logical thinking and be self-independent in problems solving
	c3	Know how the analytes are separated, identified and determined.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Discuss the nature of various separation mechanisms.
	d2	Collect data from different sources.
	d3	Write study reports.
4-Contents	1	General introduction Chromatography, Chromatographic definitions
	2	Modes of Chromatographic Developments: Frontal, Displacement and elution analysis
	3	Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography
	4	Classification of column techniques: Gas and liquid chromatography
	5	Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gases Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.



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	6	Gases introduction, Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique	
	7	Liquid chromatography: high performance liquid chromatography (HPLC), HPLC Pumps, HPLC Columns, Mobile Phases, HPLC Plumbing	
	8	Dectors for HPLC and quantitative applications.	
	9	Techniques by separation mechanism (Stationary Phase): Adsorption, partition, ion-exchange, size exclusion and Affinity chromatography	
	10	Ion Chromatography (IC)	
	11	Electrophoresis	
	12	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Homework.	☐
6- Teaching and learning methods for students with limited capacity			Not Avaliable.
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Course notes taken form essential text books written by Dept. stuff	



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b-Essential Books(text books)	1	Modern Analytical chemistry D. Harvey, Instrumental Method of Chemical Analysis. Golen W. Ewing.
c-Suggested Books		
d-Scientific periodicals or Publications	1	Library
	2	internet.

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	General introduction Chromatography, Chromatographic definitions	1	a1 ,	b1 ,	c1 , c2 ,	d1 , d2 ,
2	Modes of Chromatographic Developments: Frontal, Displacement and elution analysis	2	a1 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
3	Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography	3	a2 ,	b1 ,	c1 , c2 ,	d2 , d3 ,
4	Classification of column techniques: Gas and liquid chromatography	4	a1 , a2 ,	b2 , b3, b4 ,	c1 , c2 ,	d1 , d2 ,



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5	Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gases Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.	5	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d3 ,
6	Gases introduction, Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique	6,7	a1 , a2 ,	b3, b4 ,	c2 , c3 ,	d1 , d2 ,
7	Liquid chromatography: high performance liquid chromatography (HPLC), HPLC Pumps, HPLC Columns, Mobile Phases, HPLC Plumbing	8	a1 , a2 , a3 ,	b1 ,	c1 , c2 , c3 ,	d1 , d2 ,
8	Detectors for HPLC and quantitative applications.	9	a7 ,	b4 ,	c3 ,	d3 ,
9	Techniques by separation mechanism (Stationary Phase): Adsorption, partition, ion-exchange, size exclusion and Affinity chromatography	10,11	a1 , a2 , a4 ,	b1 , b4 ,	c1 , c2 , c3 ,	d1 , d3 ,
10	Ion Chromatography (IC)	12	a1 , a2 , a3 ,	b1 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
11	Electrophoresis	13	a6 ,	b2 , b3 ,	c1 , c2 , c3 ,	d3 ,
12	Revision	14				

Course Coordinator Prof. Dr. Nagwa Burham

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim



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Course Specification For **Organometallic compounds(2)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C3219	Title	Organometallic compounds(2)		Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	The course aims to introduce the students to the fundamental and chemistry of organometallic compounds especially magnesium compounds, grignard reagents, metal alkyls, group LA metals and group 11B metals

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Name Magnesium compounds.
	a2	List Metal alkyls, Group LA metals.
	a3	Identify Group 11B metals
	a4	List Group IVB metals
	a5	Give Group VB metals
	a6	Summarize Alkyl free radicals
b- Intellectual skills: At the end of the course the student should be able to:	b1	Formulate group 11B metals, group 111 metals and Group IVB metals
	b2	Formulate the behaviuor of different organometallic compounds



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Design different Alkyl free radicals and different group of metals	
	c2	familiarize the synthesis of various organometallic compounds.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Write a report.	
	d2	Discuss different reactions.	
	d3	Work effectively individually or as part of a team.	
	d4	Plan their work and meet deadlines.	
4-Contents	1	Introduction	
	2	Magnesium compounds: Grignard reagents.	
	3	Metal alkyls, Group LA metals.	
	4	Group 11B metals.	
	5	Group IVB metals.	
	6	Group VB metals.	
	7	Alkyl free radicals.	
	8	Revision	
5- Teaching and learning method	1	Lecturer	☐
	2	Discussion.	☐
	3	Homework.	☐



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6- Teaching and learning methods for students with limited capacity		Not Availiable.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Hand out	
b-Essential Books(text books)			
c-Suggested Books	1	"Organic chemistry", I.L.Finar. Printed, volume 2, Fifth Edition, Moreson and Bayed, 1985.	
	2	"Organic Chemistry, The Fundamental principles" Volume , Sixth Edition.	
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction	1-3	a1 , a2 , a3 ,	b1 ,	c2 ,	d1 , d2 ,
2	Magnesium compounds: Grignard reagents.	1-3	a1 ,	b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
3	Metal alkyls, Group LA metals.	4	a2 ,	b2 ,	c2 ,	d1 , d2 , d3 ,
4	Group 11B metals.	5,6	a3 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,



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5	Group IVB metals.	7,9	a4 ,	b1 , b2 , b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
6	Group VB metals.	10	a5 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
7	Alkyl free radicals.	11-13	a6 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
8	Revision	14				

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FFSFU DB



FOURTH LEVEL

FIRST SEMESTER



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Course Specification For

Histochemistry

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z422	Title	Histochemistry			Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	provide students with a basic understanding of the equipments and concepts for preparation and staining of histological sections by conventional staining procedures
2	develop understanding of the underlying principles of common histochemical techniques, and learn to distinguish between normal and pathogenic state of tissue and diagnostic the abnormality of the different chemical components and functional enzymes within tissues.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:															
b- Intellectual skills: At the end of the course the student should be able to:															
c-Professional and practical skills: At the end of the course the student should be able to:															
d-General and transferable skills: At the end of the course the student should be able to:															
4-Contents	<table border="1"> <tr> <td>1</td><td>Introduction of histochemistry, principle of histological technique, fixatives and fixations (types, significances, factors affecting reaction), types of microscopy significance of each one</td></tr> <tr> <td>2</td><td>Microtechniques: various methods of preparation sections for microscopy (paraffin, freezing and celloidin), advantages and disadvantages.</td></tr> <tr> <td>3</td><td>Histological routine technique: fixation, washing, dehydration, clearing "aim of each step".</td></tr> <tr> <td>4</td><td>Continuous of histological routine technique: infiltration, embedding, microtomy (sectioning), staining (common laboratory stain, Hx and E) and mounting; aim of each step.</td></tr> <tr> <td>5</td><td>Types of stains: acidic, basic and neutral stains, vital and supravital stains, metachromatic stain (toluidine blue), histochemical stains for identify the chemical components within tissue (e.g. carbohydrates, lipids, nucleic acids, proteins, enzymes), bases of immunohistochemistry for paraffin embedded tissue section.</td></tr> <tr> <td>6</td><td>Carbohydrates: identification, classification, detection of polysaccharides, acid and neutral mucopolysaccharides.</td></tr> <tr> <td>7</td><td>Lipids: identification, classification, histochemical demonstration by Sudan black B, oil red O, Nile blue and osmium tetroxide methods.</td></tr> </table>	1	Introduction of histochemistry, principle of histological technique, fixatives and fixations (types, significances, factors affecting reaction), types of microscopy significance of each one	2	Microtechniques: various methods of preparation sections for microscopy (paraffin, freezing and celloidin), advantages and disadvantages.	3	Histological routine technique: fixation, washing, dehydration, clearing "aim of each step".	4	Continuous of histological routine technique: infiltration, embedding, microtomy (sectioning), staining (common laboratory stain, Hx and E) and mounting; aim of each step.	5	Types of stains: acidic, basic and neutral stains, vital and supravital stains, metachromatic stain (toluidine blue), histochemical stains for identify the chemical components within tissue (e.g. carbohydrates, lipids, nucleic acids, proteins, enzymes), bases of immunohistochemistry for paraffin embedded tissue section.	6	Carbohydrates: identification, classification, detection of polysaccharides, acid and neutral mucopolysaccharides.	7	Lipids: identification, classification, histochemical demonstration by Sudan black B, oil red O, Nile blue and osmium tetroxide methods.
1	Introduction of histochemistry, principle of histological technique, fixatives and fixations (types, significances, factors affecting reaction), types of microscopy significance of each one														
2	Microtechniques: various methods of preparation sections for microscopy (paraffin, freezing and celloidin), advantages and disadvantages.														
3	Histological routine technique: fixation, washing, dehydration, clearing "aim of each step".														
4	Continuous of histological routine technique: infiltration, embedding, microtomy (sectioning), staining (common laboratory stain, Hx and E) and mounting; aim of each step.														
5	Types of stains: acidic, basic and neutral stains, vital and supravital stains, metachromatic stain (toluidine blue), histochemical stains for identify the chemical components within tissue (e.g. carbohydrates, lipids, nucleic acids, proteins, enzymes), bases of immunohistochemistry for paraffin embedded tissue section.														
6	Carbohydrates: identification, classification, detection of polysaccharides, acid and neutral mucopolysaccharides.														
7	Lipids: identification, classification, histochemical demonstration by Sudan black B, oil red O, Nile blue and osmium tetroxide methods.														



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	8	Nucleic acids: structure, differences between DNA and RNA, significance of each, demonstration of DNA by Feulgen reaction, differentiation between DNA and RNA by methylene green pyronine method.	
	9	Amino acids and proteins; classification, histochemical detection of total protein contents by mercury bromophenol blue stain, demonstration of different fibrous proteins (scleroproteins as: collagen, reticulin, elastin and keratin) by different selective stains, distinguish them between normal and abnormal tissues and organs.	
	10	lamins), microtubules (α tubulin and β tubulin), molecular structure and assembly of each.	
	11	Detection of cytoskeletal protein filaments by using immunohistochemical technique to visualize each filamnt with selective specific antibody, distinguish normal and abnormal filaments microscopically.	
	12	Enzymes: Definition, classification, localization, histochemical reactions, freezing histochemical bases technique using acryostat (freezing microtomy); functional activities or inactivities of normal and abnormal tissues.	
	13	Histochemical detection of acid and alkaline phosphatases by using many methods (azo dye method and metal salt method), ATPase, succinic dehydrogenase, cytochrome oxidase, esterase, lipase, peptidase, and explain the reaction of each one.	
	14	Pigments, types of endogenous and exogenous pigments, histochemical detection of each. Minerals: calcium, iron, copper, lead, aluminium, and histochemical demonstration.	
5- Teaching and learning method			
6- Teaching and learning methods for students with limited capacity			Not Avaliable.
7-Student Assessment Methods			
a-Using Assessment	1	Mid-term Examination	
	2	Final-term Examination	
	3	Oral Examination	
	4	Practical Examination	
b-Assessment Schedule	1	Mid-term Examination	8
	2	Final-term Examination	15
	3	Oral Examination	13



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	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-term Examination	2.5	3.33%
	2	Final-term Examination	55	73.33%
	3	Oral Examination	2.5	3.33%
	4	Practical Examination	15	20.00%
8-List of References				
a-Course notes	1	Course notes and Laboratory manual authorized by the Council of Department of Zoology		
b-Essential Books(text books)	1	Principles of Histochemistry “Theoretical and Applied” and Atlas of Histochemistry.		
c-Suggested Books				
d-Scientific periodicals or Publications	FSFU DB			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction of histochemistry, principle of histological technique, fixatives and fixations (types, significances, factors affecting reaction), types of microscopy significance of each one	1				
2	Microtechniques: various methods of preparation sections for microscopy (paraffin, freezing and celloidin), advantages and disadvantages.	2				



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3	Histological routine technique: fixation, washing, dehydration, clearing “aim of each step”.	3				
4	Continuous of histological routine technique: infiltration, embedding, microtomy (sectioning), staining (common laboratory stain, Hx and E) and mounting; aim of each step.	4				
5	Types of stains: acidic, basic and neutral stains, vital and supravital stains, metachromatic stain (toluidine blue), histochemical stains for identify the chemical components within tissue (e.g. carbohydrates, lipids, nucleic acids, proteins, enzymes), bases of immunohistochemistry for paraffin embedded tissue section.	5				
6	Carbohydrates: identification, classification, detection of polysaccharides, acid and neutral mucopolysaccharides.	6				
7	Lipids: identification, classification, histochemical demonstration by Sudan black B, oil red O, Nile blue and osmium tetroxide methods.	7				



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8	Nucleic acids: structure, differences between DNA and RNA, significance of each, demonstration of DNA by Feulgen reaction, differentiation between DNA and RNA by methylene green pyronine method.	8				
9	Amino acids and proteins; classification, histochemical detection of total protein contents by mercury bromophenol blue stain, demonstration of different fibrous proteins (scleroproteins as: collagen, reticulin, elastin and keratin) by different selective stains, distinguish them between normal and abnormal tissues and organs.	9				
10	lamins), microtubules (α tubulin and β tubulin), molecular structure and assembly of each.	10				
11	Detection of cytoskeletal protein filaments by using immunohistochemical technique to visualize each filamnt with selective specific antibody, distinguish normal and abnormal filaments microscopically.	11				



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12	Enzymes: Definition, classification, localization, histochemical reactions, freezing histochemical bases technique using acryostat (freezing microtomy); functional activities or inactivities of normal and abnormal tissues.	12				
13	Histochemical detection of acid and alkaline phosphatases by using many methods (azo dye method and metal salt method), ATPase, succinic dehydrogenase, cytochrome oxidase, esterase, lipase, peptidase, and explain the reaction of each one.	13				
14	Pigments, types of endogenous and exogenous pigments, histochemical detection of each. Minerals: calcium, iron, copper, lead, aluminium, and histochemical demonstration.	14				

Course Coordinator Prof. Dr. **Ayman Mustafa + Abd El krem Mohammed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Comparative Anatomy**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z441	Title	Comparative Anatomy			Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course is designed to accustom graduate students with the importance of comparative anatomy

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Outline histology of the Anatomy
	a2	Recognize different anatomical features of vertebrates
	a3	State different anatomical positions in vertebrate body
	a4	List methods of differentially between vertebrates based on Anatomy.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe Relationship between anatomical structures in different groups
	b2	Recognize different parts of the body and compare them in different vertebrates
	b3	Review vertebrates on the basis of anatomical features
	b4	Identify the basic structural unit for each system.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Employ training in dissection and examination of various tissues	
	c2	Apply the use of the microscope to examine histological slides.	
	c3	Illustrate Anatomical positions.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team to collect specific information	
	d2	Use information and communication technology effectively	
	d3	Think independently and dissect animals as well as study organs.	
	d4	Use finding and suggest logical methods to solve difficulties.	
	d5	Work in groups effectively; manage time, collaborate and communicate with others positively.	
	d6	Consider community linked problems, ethics and traditions.	
	d7	Acquire self- and long life-learning.	
	d8	Apply scientific models, systems, and tools effectively.	
4-Contents	1	Definition of Anatomy, Comparative Anatomy. Brief history of Comparative Anatomy. Method of studying Comparative Vertebrate Anatomy	
	2	Integumentary system	
	3	Nervous system	
	4	Skeletal system	
5- Teaching and learning method	1	In-class Lecturing (using PowerPoint presentation and illustrations)	☐
	2	Discussion	☐
	3	Encouraging students to submit activities, assignments, writing reports and presenting them.	☐
	4	DVD videos and animations	☐
	5	Study tips and Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam	to assess Knowledge and understanding and Intellectual skills	
	2	Midterm exam.		
	3	Practical Examination	to assess Professional skills	
	4	Oral Exam	to assess Knowledge, understanding and Intellectual skills	
b-Assessment Schedule	1	Final written exam	15	
	2	Midterm exam.	8	
	3	Practical Examination	13	
	4	Oral Exam	14	
c-Weighting of Assessments	1	Final written exam	55	73.33%
	2	Midterm exam.	2.5	3.33%
	3	Practical Examination	15	20.00%
	4	Oral Exam	2.5	3.33%
8-List of References				
a-Course notes	1	Prepared by Dept. stuff		
b-Essential Books(text books)	1	K.V. Kardong, 5th editions. Vertebrates, Comparative Anatomy, Functions and evolution. ISBN: 10: 0-39-011705-6		
c-Suggested Books	1	M. A. Dakhil, 2009. Comparative Vertebrate Anatomy. Lecture notes. Zoology department, College of Science KSU.		
d-Scientific periodicals or Publications	1	library Periodicals, Web sites, ... etc		



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Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Definition of Anatomy, Comparative Anatomy. Brief history of Comparative Anatomy. Method of studying Comparative Vertebrate Anatomy	1,2	a3 , a4 ,	b1 , b2 ,	c2 ,	d1 , d2 ,
2	Integumentary system	3-6	a1 , a4 ,	b1 , b3 , b4 ,	c1 , c2 ,	d3 , d7 ,
3	Nervous system	7-10	a2 ,	b3 , b4 ,	c1 , c3 ,	d3 , d4 , d7 ,
4	Skeletal system	11-14	a2 ,	b3 , b4 ,	c1 , c3 ,	d5 , d6 , d8 ,

Course Coordinator Prof. Dr. Samah Mamdouh Mohammed Fathy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For

Experimental Embryology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z442	Title	Experimental Embryology		Level	4	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	This course is designed to accustom graduate students with the importance of applying experiments on embryos.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Identify properties and embryo cell determination and differentiation
	a2	Describe teratology and the sensitive period of embryo development
	a3	Describe the differences between cancer cells, embryo cell and parthenogenesis
	a4	Recall the latest developments in baby test tube IVF, ICSI and application.
	a5	Define the chimera, cloning, stem cell and cryo preservation.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe embryo development.
	b2	Discuss embryo abnormalities.
	b3	Explain the tissue and embryo cultures
	b4	Explain some of the applied experiments like, artificial insemination (AI) baby test tube (IVF), chimera, and Cloning.



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	b5	Describe the stem cells types and its applications.	
	b6	Identify Cryopreservation	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Demonstrate slides and samples of embryo.	
	c2	Illustrate in vitro fertilization.	
	c3	Demonstrate embryo abnormalities	
	c4	Apply knowledge to conduct a specific experiment.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team to collect specific information	
	d2	Use information and communication technology effectively to restore embryonic information.	
	d3	Ability to discuss finding and present it.	
	d4	Work in groups effectively; manage time, collaborate and communicate with others positively.	
	d5	Consider community linked problems, ethics and traditions.	
	d6	Acquire self- and long life-learning.	
	d7	Apply scientific models, systems, and tools effectively.	
4-Contents	1	Introduction and history of experimental embryology. Differentiation (specification and determination), embryonic organizer and embryonic induction	
	2	Cancer and embryo cells	
	3	Embryo Teratology. Parthenogenesis	
	4	Some applied experimental embryology, Baby test tube (IVF), Identical twin production, cloning.	
	5	More Applied experiments, Chimera, Gametes, stem cells and embryo Cry preservation.	
5- Teaching and learning method	1	In-class Lecturing (using PowerPoint presentation and illustrations)	☐
	2	Discussion	☐
	3	Encouraging students to submit activities, assignments, writing reports and presenting them.	☐
	4	DVD videos and animations	☐
	5	Study tips and Homework	☐



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	6	Visiting some IVF unit at the hospital of faculty of Medicine and/or faculty of Nurse or Genomic bank or applied experiments if possible.		☐
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination	exam to assess Knowledge and understanding and Intellectual skills	
	2	Practical Examination	to assess Professional skills	
	3	Oral Exam	to assess Knowledge, understanding and Intellectual skills	
	4	Midterm Exam.		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Practical Examination	13	
	3	Oral Exam	10	
	4	Midterm Exam.	8	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Practical Examination	10	20.00%
	3	Oral Exam	2.5	5.00%
	4	Midterm Exam.	2.5	5.00%



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8-List of References		
a-Course notes	1	By Stuff department
b-Essential Books(text books)	1	Gilbert 7th. ed., Development Biology
c-Suggested Books		
d-Scientific periodicals or Publications	1	library Periodicals, Web sites, ... etc

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction and history of experimental embryology. Differentiation (specification and determination), embryonic organizer and embryonic induction	1-5	a1 ,	b1 ,	c4 ,	d1 , d2 , d6 ,
2	Cancer and embryo cells	6	a3 ,	b3 ,	c1 ,	d2 , d3 , d6 ,
3	Embryo Teratology. Parthenogenesis	7,8	a2 , a3 ,	b2 ,	c3 ,	d1 , d2 , d6 ,
4	Some applied experimental embryology, Baby test tube (IVF), Identical twin production, cloning.	9-11	a4 , a5 ,	b4 ,	c2 ,	d1 , d3 , d7 ,
5	More Applied experiments, Chimera, Gametes, stem cells and embryo Cry preservation.	12-14	a5 ,	b4 , b5 , b6 ,	c4 ,	d1 , d2 , d3 , d4 , d5 , d7 ,

Course Coordinator Prof. Dr. Samah Mamdouh Mohammed Fathy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied



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Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

Nuclear&Radiation Chemistry (A)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C431	Title	Nuclear&Radiation Chemistry (A)			Level	4	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		1	

2- Overall aims of the course

- By the end of this course, the students will be able to:
 - 1- Instill in students a sense of enthusiasm for chemistry, an appreciation of its application in different contexts and to involve them in an intellectually stimulating and satisfying experience of learning and studying.
 - 2- To encourage originality of thought.
 - 3- To provide students with a broad and balanced foundation of chemical knowledge and skills.
 - 4- To develop in students the ability to apply their chemical knowledge and skills to the solution of theoretical and practical problems in chemistry.
 - 5- To develop in students, through an education in chemistry, a range of transferable skills, of value in chemical and non-chemical employment
 - 6- To provide students with aknowledge and skills base from which they can proceed to further studies in specialized areas of nuclear chemistry.
 - 7- To generate in students an appreciation of the importance of chemistry in an industrial, economic,environmental and social context.
 - 8- To provide students with experience in computing and information technology.
 - 9- To provide students with abroad education in fundamental aspects of chemistry and higher level of knowledge and



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		understanding of subjects. 10- To become conversant with the following main aspects of nuclear chemistry:- i- Major aspects of nuclear terminology, nomenclature, conventions and units. ii- The major types of nuclear reaction and the main characteristics associated with them. iii- The kinetics of nuclear change. iv- The characteristic properties of radiations. v- Methods of studying nuclide and its reactions. vi- Awareness of major issues currently at the frontiers of chemical research and development. 11. To differentiate between the different types of radiations, nuclides and nuclear reactions
3- intended learning outcomes (ILOs)		
a- Knowledge and understanding: At the end of the course the student should be able to:	a1	demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to nuclear Chemistry.
	a2	Describe the solution of a familiar and unfamiliar nature problems.
	a3	recognize novel problems and plan strategies for their solution
	a4	present scientific material and arguments clearly and correctly, in writing and orally, to a range of audiences.
b- Intellectual skills: At the end of the course the student should be able to:	b1	differentiate between the stable isotopes and the unstable ones.
	b2	calculate nuclear binding energy for different isotopes.
	b3	Evaluate the rate of radioactivity.
	b4	date the age of fossils and different archaeological, geological, and hydrogeological samples.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	use scientific literature effectively
	c2	conduct risk assessments concerning the use of nuclear chemical substances.
	c3	evaluation, interpretation and synthesis of nuclear information and data.
	c4	Measure radioactive dating.



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d-General and transferable skills: At the end of the course the student should be able to:	d1	express (orally and writing) there understanding problems.
	d2	identify the essential parts of a problem and formulate a strategy for solving the problem and able to estimate the solution to a problem ,apply appropriate techniques to arrive the solution, test the correctness of there solution ,interpret their results and connect it to related areas of chemistry.
	d3	use information and communications technology.
	d4	work independently and as a part of a team, and learn independently with open - mindedness and critical enquiry.
	d5	plan and implement efficient and effective modes of working.
	d6	Continue professional development.
4-Contents	1	Radioactivity 1.1- Introduction 1.2- Classification of nuclides
	2	Radioactivity and nuclear bombardment reactions 2.1- Comparison of chemical reactions with nuclear reactions 2.2- Nuclear stability 2.3- Types of radioactive decay 2.4- Radioactive decay series 2.5- Nuclear bombardment reactions 2.5.1- Transmutation 2.5.2- Accelerators 2.5.3- Transuranium elements
	3	Radiation and matter 3.1- Radiation counters 3.1.1- Geiger counter 3.1.2- Scintillation counter 3.2- Biological effects
	4	Rate of radioactivity 4.1-Rate of radioactive decay 4.2- Radioactive dating
	5	Applications of radioactive isotopes 5.1- Chemical analysis 5.2- Medical therapy and diagnosis
	6	Mass-energy calculations 6.1- Mass-energy equivalence 6.2- Nuclear Binding



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	7	Nuclear fission and nuclear fusion 7.1- Nuclear fission; Nuclear reactors 7.2- Nuclear fusion		
5- Teaching and learning method	1	Lecture		☐
	2	Discussion		☐
	3	Homework +The activities of the E-learning course		☐
6- Teaching and learning methods for students with limited capacity				Not Availiable.
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Oral exam and E-learning course activities		
	3	Mid-Term Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Oral exam and E-learning course activities	14	
	3	Mid-Term Examination	8	
c-Weighting of Assessments	1	Final-term Examination	20	80.00%
	2	Oral exam and E-learning course activities	2.5	10.00%
	3	Mid-Term Examination	2.5	10.00%
8-List of References				
a-Course notes	1	Course Notes written by chmistry departmnt		
b-Essential Books(text books)	1	General Chemistry for Ebbing		
	2	Introduction to chemical principles, eighth edition. H. Stephen Stoker.		
	3	Advanced Chemistry, Philip Matthews.		
c-Suggested Books	1	Radioactivity Radionuclides Radiation Textbook by Magill, Galy. ISBN -3-540-21116-0, Springer,		



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		2005.
	2	Radiochemistry and Nuclear Chemistry Comprehensive textbook by Choppin, Liljenzin and Rydberg. ISBN -0750674636, Butterworth-Heinemann, 2001
	3	Radioactivity, Ionizing radiation and Nuclear Energy Basic textbook for undergraduates by Jiri Hala and James D Navratil. ISBN -807302053-X, Konvoj, Brno 2003 Collman, James P., et al. Principles and Applications of Organotransition Metal Chemistry. Mill Valley, CA: University Science Books, 1987. ISBN: 9780935702514.
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Radioactivity 1.1- Introduction 1.2- Classification of nuclides	1	a1 ,		c1 ,	d1 , d4 ,



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2	Radioactivity and nuclear bombardment reactions 2.1- Comparison of chemical reactions with nuclear reactions 2.2- Nuclear stability 2.3- Types of radioactive decay 2.4- Radioactive decay series 2.5- Nuclear bombardment reactions 2.5.1- Transmutation 2.5.2- Accelerators 2.5.3- Transuranium elements	2-4	a1 , a2 , a3 , a4 ,	b1 ,	c1 ,	d2 , d1 , d4 ,
3	Radiation and matter 3.1- Radiation counters 3.1.1- Geiger counter 3.1.2- Scintillation counter 3.2- Biological effects	5,6	a1 , a4 ,		c1 , c2 , c3 ,	d1 , d3 , d4 , d6 ,
4	Rate of radioactivity 4.1-Rate of radioactive decay 4.2- Radioactive dating	7-9	a2 , a3 , a4 ,	b3 , b4 ,	c2 , c1 , c4 ,	d1 , d4 , d5 , d6 ,
5	Applications of radioactive isotopes 5.1- Chemical analysis 5.2- Medical therapy and diagnosis	10,11	a3 , a4 ,		c2 , c1 ,	d1 , d3 , d4 , d5 , d6 ,
6	Mass-energy calculations 6.1- Mass-energy equivalence 6.2- Nuclear Binding	12	a1 , a4 ,	b2 ,	c2 , c1 , c3 ,	d2 , d4 , d5 , d6 ,
7	Nuclear fission and nuclear fusion 7.1- Nuclear fission; Nuclear reactors 7.2- Nuclear fusion	13,14	a1 , a4 ,	b1 ,	c2 , c1 , c3 ,	d2 , d1 , d3 , d4 , d5 , d6 ,



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Course Coordinator Prof. Dr.

Rania Gaber Mohamed Khalil

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

Chemistry of High polymers & Detergents 2

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C427	Title	Chemistry of High polymers & Detergents 2		Level	4	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	The over all objectives is to provide students with a basic The overall aims of the study of this course is: -The concept of monomers, high polymers-to introduce the students to the fundamental polymerization. -Thermoplastic and thermosetting polymers and linear polymer. -The theory of detergents, types of detergents and their applications.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Developed an interdisciplinary understanding of the principles of systems
	a2	Define subject-specific theories, concepts and principles.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Correlate structure and properties of different types of polymers
	b2	Synthesize, analyze and evaluate information.
	b3	Differentiate between different processes techniques



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Approach to academic literature and other sources of information	
	c2	Describe the different Polymerization techniques.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Collect, record, analyze and interpret data from a range of sources.	
	d2	Demonstrate flexibility when solving numerical and other complex appropriate techniques.	
	d3	Use information technology applications.	
4-Contents	1	Introduction and definition: classification of polymers, nomenclature	
	2	Synthesis of polymers (general consideration)	
	3	Radical vinyl polymerization Ionic vinyl polymerization	
	4	Co-ordination polymerization	
	5	Step-wise polymerization (poly -condensation) and ring opening polymerization	
	6	Co-polymerization and polymerization techniques	
	7	Physical properties of polymers and crystalline - non-crystalline regions in polymer mass	
	8	Technology of high polymers (rubber)	
	9	Fibers and plastic technology	
	10	High-temperature polymers Thermosetting resins, formaldehyde resins	
	11	Biodegradable plastics	
	12	Theory of detergents	
	13	Types of detergents, applications	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	10.00%
	2	Final-term Examination	20	80.00%
	3	Oral Examination	2.5	10.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students’ part by part. and questions - answer sheets		
b-Essential Books(text books)	1	Polymer science and technology Robert O. Ebewelw 2000		
c-Suggested Books	1	Polymer science V. R. Gowariker		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction and definition: classification of polymers, nomenclature	1	a1 , a2 ,	b1 ,	c2 ,	d2 ,



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2	Synthesis of polymers (general consideration)	2	a1 , a2 ,	b1 ,	c2 ,	d2 ,
3	Radical vinyl polymerization Ionic vinyl polymerization	3	a2 ,	b1 ,	c2 ,	d1 ,
4	Co-ordination polymerization	4	a1 ,	b3 ,	c1 ,	d1 ,
5	Step-wise polymerization (poly -condensation) and ring opening polymerization	5	a1 , a2 ,	b3 ,	c1 ,	d1 ,
6	Co-polymerization and polymerization techniques	6	a1 ,	b3 ,	c1 ,	d1 ,
7	Physical properties of polymers and crystalline - non-crystalline regions in polymer mass		a1 ,	b3 ,	c1 ,	d1 ,
8	Technology of high polymers (rubber)	8	a1 , a2 ,	b3 ,	c1 ,	d1 ,
9	Fibers and plastic technology	9	a1 ,	b3 ,	c1 ,	d1 ,
10	High-temperature polymers Thermosetting resins, formaldehyde resins	10	a1 ,	b2 ,	c2 ,	d1 ,
11	Biodegradable plastics		a1 ,	b2 ,	c2 ,	d3 ,
12	Theory of detergents		a1 ,	b2 ,	c2 ,	d3 ,
13	Types of detergents, applications	13	a1 , a2 ,			d3 ,

Course Coordinator Prof. Dr. Zeinab R. F. Mohamed

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For

Electrochemistry (2)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C442	Title	Electrochemistry (2)			Level	4	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Understand the main concepts.
2	Be aware of the types of references and indicator electrodes .
3	Know the different membrane electrodes.
4	Know the importance and application of membrane electrodes in the electrochemistry.
5	Be aware of the types of different electro analytical methods of analysis
6	Know the main differences between the membrane electrodes.
7	know the composition of the different membrane electrodes
8	Know the potentiometric titration method.
9	Know the conductometric titration method
10	Know the electrodeposition and polarography methods of analysis.
11	Know the coulometry and amperometry method of analysis.
12	Know the main differences between the different methods of electroanalytical methods.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate the main Knowledge and curves.
	a2	Describe of the different indicator electrodes.
	a3	Illustrate the type of membrane electrodes.s
	a4	Know the composition of glass and liquid membrane electrode
	a5	Know the composition of solid and gas sensing membrane electrode.
	a6	List the types of electrometric methods of analysis.
	a7	Study the potentiometric and conductomtric titration.
	a8	Study the electrodeposition and conductomtric titration.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Conclude the information from both lectures and library.
	b2	Perform some exercises to apply the studied laws in course
	b3	Compare between the types of membrane electrodes.
	b4	Differentiate between references and indicator electrodes.
	b5	Differentiate between different electrometric methods.
	b6	Determination the concentration of different ions by using electrometric methods.
	b7	Determine the emf of the different cell and the relation between potential of electrode and concentration
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Design some electric circuits and Perform the potential of the cell.
	c2	Solve different problems related to potential of electrodes.
	c3	Dissect the difference between the types of membrane electrodes and over potentials.
	c4	Calculate the ptential of the different cell that containing membrane electrode as indicator electrode.
	c5	Measured the potential for different membrane electrood
d-General and transferable skills: At the end of the course the student should be able to:	d1	Discuss the types of electrodes.
	d2	(Oral) present report in .seminar
	d3	Write a report.
	d4	Use the computer
	d5	Communicate with topics and internet
	d6	Solve problem
	d7	Work in a team



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4-Contents	1	Introduction, half-cell potential, Galvanic cells, the Daniel's cell measurements of EMF, standard Weston cell, Refrence electrodes	
	2	Effect of concentration, pressure, and temperature on the EMF, Electrode potential and Nernst equation, standard electrode potentials, the hydrogen electrode, reference electrodes, junction potentials. Examples	
	3	Types of indicator electrodes. Problems.	
	4	Types of membrane electrodes. Examples	
	5	The composition and mechanism of glass membrane electrode - problems	
	6	The composition and mechanism of liquide membrane electrode.	
	7	The composition and mechanism of solid state and gas sensing membrane electrode, examples.	
	8	Potentiometric titration method of analysis.	
	9	Conductometric titration method of analysis and the difference between the potentiomtric and conducomertic titration methode	
	10	Electrodeposition method of analysis	
	11	Amperometric and coulomtric method of analysis	
	12	The main differences between the potentiometric, conductometric, electrodeposition, amperometric and coulomteric methods	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final term examination	to assess student's ability in understanding the concepts discussed in the courses
	2	Practical exam	
	3	Mid term examination	
	4	Oral examination	



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b-Assessment Schedule	1	Final term examination	15	
	2	Practical exam	14	
	3	Mid term examination	8	
	4	Oral examination	10	
c-Weighting of Assessments	1	Final term examination	35	70.00%
	2	Practical exam	10	20.00%
	3	Mid term examination	2.5	5.00%
	4	Oral examination	2.5	5.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes.		
b-Essential Books(text books)	1	R. A. Alberty, "physical Chemistry" 7th Ed. John Wiley & Sons 1992.		
	2	W. J. Moore "Physical Chemistry"; Prentice-Hall, 1983.		
c-Suggested Books	1	"Electroanalytical chemistry" in the library.		
d-Scientific periodicals or Publications	1	Library - Web sites en.wikipedia.org/wiki/Electrochemistry journal of electroanalytical chemistry. Journal of electrochemical acta.		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction, half-cell potential, Galvanic cells, the Daniel's cell measurements of EMF, standard Weston cell, Reference electrodes	1,2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,



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2	Effect of concentration, pressure, and temperature on the EMF, Electrode potential and Nernst equation, standard electrode potentials, the hydrogen electrode, reference electrodes, junction potentials. Examples	3	a1 , a2 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 ,	d2 , d3 ,
3	Types of indicator electrodes. Problems.	4,5	a4 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d3 ,
4	Types of membrane electrodes. Examples	6	a3 ,	b1 , b2 ,	c3 ,	d1 , d6 , d7 ,
5	The composition and mechanism of glass membrane electrode - problems	7	a2 ,	b2 , b4 ,	c1 , c2 ,	d1 , d5 ,
6	The composition and mechanism of liquide membrane electrode.	8	a1 , a4 ,	b1 , b4 , b5 ,	c4 ,	d3 , d7 ,
7	The composition and mechanism of solid state and gas sensing membrane electrode, examples.	9	a1 , a6 ,	b1 , b6 ,	c1 , c3 ,	d2 ,
8	Potentiometric titration method of analysis.	10	a6 ,	b1 , b7 ,	c1 , c3 ,	d1 , d2 ,
9	Conductometric titration method of analysis and the difference between the potentiomtric and conducomertic titration methode	11	a7 ,	b1 , b2 , b7 ,	c1 , c2 , c3 ,	d1 , d2 ,
10	Electrodeposition method of analysis	12	a7 ,	b1 , b2 , b7 ,	c1 , c2 , c3 ,	d1 , d3 ,
11	Amperometric and coulomtric method of analysis	13	a4 ,	b1 , b2 ,	c1 , c3 ,	d1 , d3 , d6 ,



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12	The main differences between the potentiometric, conductometric, electrodeposition, amperometric and coulomteric methods	14	a3 ,	b1 ,	c1 , c5 ,	d1 , d2 , d7 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Head of department: Prof. Dr.

Date: 2016

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Course Specification For **Organic spectroscopy**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C422	Title	Organic spectroscopy			Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	To understand the basic concepts of UV and visible light
2	To understand the relation between Hook's law and infra-red
3	To study the principle of proton magnetic resonance and ¹³ C NMR, and Mass spectroscopy

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand the relation between color and concentration of organic compounds.
	a2	Determination the functional group of organic compound.
	a3	Understand the different protons of organic compounds and ¹³ C- atom.
	a4	Understand structure of organic compound by mass spectroscopy.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Determine the concentration of compounds
	b2	Identify the different protons and carbon-13 atom.
	b3	Indemnify the function group such as -OH, - C-, C-H, C=N , C=C.....etc.



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	b4	Use the different apparatus of UV and visible, NMR, and mass spectroscopy.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Identify different function groups.	
	c2	Diffrentiate between different type of spectroscopic methods	
	c3	Deduce the structure of organic compounds using different techniques.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team.	
	d2	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)	
	d3	Write report	
4-Contents	1	Introduction	
	2	UV, visible light	
	3	Infra-red	
	4	^1H -NMR	
	5	^{13}C -NMR	
	6	Mass spectrometer	
	7	Problems	
5- Teaching and learning method	1	lecture.	☐
	2	Discussion	☐
	3	Homework.	☐
	4	Instrumental training.	☐



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6- Teaching and learning methods for students with limited capacity		Not Avaliable.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Lectures notes and hand out notes to the students part by part	
b-Essential Books(text books)	1	Finar, volume 2,by Moreson &Boyed,2000.	
	2	Marcon and Boyer, 1983, Allyn and Bacon. Inc	
c-Suggested Books			
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction	1	a1 ,	b1 ,	c1 ,	d2 ,
2	UV, visible light	1,2	a1 ,	b1 ,	c1 , c2 ,	d1 , d2 ,
3	Infra-red	3,4,5	a2 ,	b3 ,	c2 , c3 ,	d2 ,
4	¹ H-NMR	6,7	a3 ,	b2 ,	c2 , c3 ,	d2 ,
5	¹³ C-NMR	8	a3 ,	b2 ,	c2 , c3 ,	d2 ,
6	Mass spectrometer	9,10	a4 ,	b4 ,	c2 , c3 ,	d2 ,
7	Problems	11,12	a4 ,	b4 ,	c1 , c2 , c3 ,	d1 , d3 ,

Course Coordinator Prof. Dr.

Asmaa Kamal Mourad



Fayoum Univeristy

Faculty of Science



Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

QA FSFU DB



FOURTH LEVEL

SECOND SEMESTER



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Course Specification For

Entomology (3) (Medical Entomology)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z458	Title	Entomology (3) (Medical Entomology)			Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1		

2- Overall aims of the course

1	To learn the students the basic information of Medical Entomology.
2	The role of insect vector in diseases transmission.
3	Types of diseases transmitted by insects(viral, protozoal and bacterial)
4	Insect orders of medically importance.
5	Life cycles, and ecology of some medically important insects.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Know the most important insects incriminated in disease transmission
	a2	Know the pathogenic parasites and the development of these parasites inside the vector
	a3	Develop a control program for these harmful insects.



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>Demonstrate knowledge of the required of this course.</td></tr> </table>	b1	Demonstrate knowledge of the required of this course.																		
b1	Demonstrate knowledge of the required of this course.																				
c-Professional and practical skills: At the end of the course the student should be able to:																					
d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Work effectively in team.</td></tr> <tr> <td>d2</td><td>Develop skills related to creative thinking, problem solving, and teamwork.</td></tr> </table>	d1	Work effectively in team.	d2	Develop skills related to creative thinking, problem solving, and teamwork.																
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4-Contents	<table border="1"> <tr> <td>1</td><td>Order Diptera Families: Simuliidae, Eg: Blackflies</td></tr> <tr> <td>2</td><td>Families: Ceratopogonidae, Eg. Biting midges</td></tr> <tr> <td>3</td><td>Families: Glossinidae, Eg: Tsetse flies</td></tr> <tr> <td>4</td><td>Families: Tabanidae, Eg:Tabanus Eg: chrysops Eg: Haematopota</td></tr> <tr> <td>5</td><td>Families: Psychodidae Eg: Sandflies</td></tr> <tr> <td>6</td><td>Flies and myiasis: Chrysomya bezziana, Sarcophaga sp., Dermatobia hominis</td></tr> <tr> <td>7</td><td>Families: Culicidae (Mosquitoes)</td></tr> <tr> <td>8</td><td>Order: Siphonaptera Eg: Fleas</td></tr> <tr> <td>9</td><td>Order: Phthiraptera Eg: Anoplura –sucking lice(phthirus rubis, Pediculus humanus, Pediculus capitis)- Mallophaga (chewing or biting lice)</td></tr> <tr> <td>10</td><td>Order: Hemiptera Family: Cimicidae Eg: Cimex lectularius Eg: Cimex hemipterus</td></tr> </table>	1	Order Diptera Families: Simuliidae, Eg: Blackflies	2	Families: Ceratopogonidae, Eg. Biting midges	3	Families: Glossinidae, Eg: Tsetse flies	4	Families: Tabanidae, Eg:Tabanus Eg: chrysops Eg: Haematopota	5	Families: Psychodidae Eg: Sandflies	6	Flies and myiasis: Chrysomya bezziana, Sarcophaga sp., Dermatobia hominis	7	Families: Culicidae (Mosquitoes)	8	Order: Siphonaptera Eg: Fleas	9	Order: Phthiraptera Eg: Anoplura –sucking lice(phthirus rubis, Pediculus humanus, Pediculus capitis)- Mallophaga (chewing or biting lice)	10	Order: Hemiptera Family: Cimicidae Eg: Cimex lectularius Eg: Cimex hemipterus
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	11	Revision		
5- Teaching and learning method	1	Lectur / Data show.		☒
6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-term Examination		
	3	oral Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-term Examination	8	
	3	oral Examination	10	
c-Weighting of Assessments	1	Final-term Examination	20	80.00%
	2	Mid-term Examination	2.5	10.00%
	3	oral Examination	2.5	10.00%
8-List of References				
a-Course notes	1	Lecture in medical Entomology		
b-Essential Books(text books)	1	Entomology in human & animal health (1979)		
	2	Macmillan Robert Harwood & Maurice James		
	3	- Kettle D.S. (1996) Medical and veterinary Entomology, 2nd edition, Cab International		
c-Suggested Books	1	Atlas of Medical Helminthology and Protozoology 2nd edition (1975) Jeffrey H.C. and Leach B.E.M.		
	2	Insects and other arthropods of medical importance- The Trustees of British Museum (natural history) London.		
d-Scientific periodicals or Publications	1	Periodicals, Web Sites		



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Faculty of Science

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Order Diptera Families: Simuliidae, Eg: Blackflies	1	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
2	Families: Ceratopogonidae, Eg. Biting midges	2	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
3	Families: Glossinidae, Eg: Tsetse flies	3, 4	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
4	Families: Tabanidae, Eg: Tabanus Eg: chrysops Eg: Haematopota	5, 6	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
5	Families: Psychodidae Eg: Sandflies	7	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
6	Flies and myiasis: Chrysomya bezziana, Sarcophaga sp., Dermatobia hominis	8, 9	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
7	Families: Culicidae (Mosquitoes)	10	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
8	Order: Siphonaptera Eg: Fleas	11	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
9	Order: Phthiraptera Eg: Anoplura –sucking lice(phthirus rubis, Pediculus humanus, Pediculus capitis)- Mallophaga (chewing or biting lice)	12	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,
10	Order: Hemiptera Family: Cimicidae Eg: Cimex lectularius Eg: Cimex hemipterus	13	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,



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11	Revision	14	a1 , a2 , a3 ,	b1 ,		d1 , d2 ,

Course Coordinator Prof. Dr.

Afaf Elgindy

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For **Physiology & immunity**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z416	Title	Physiology & immunity		Level	4	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3	

2- Overall aims of the course

1	The overall aims of the study of this course are: The course comprises: Topic 1: Physiology of Blood, Respiration and Excretion : Acquire the theoretical background and experience of laboratory in the Physiology of Blood, Respiration and Excretion. Topic 2 : Immunity : Examine the mechanism by which the body defends itself from general assaults and specific invaders.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate basic scientific facts, concepts, principles, techniques and applications related to hematology, respiration excretion and immunology.
	a2	List theories and methods applied for analyzing general components of blood and urine and understand some of clinical conditions occurring due to deficiency of one or more of the blood and urine components.
	a3	Describe processes and mechanisms supporting the structure and function of the lymphatic system.



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>Describe gaseous transport in the blood, different mechanisms dealing with hemopoiesis, blood coagulation, osmoregulation and salt balance process.</td></tr> <tr> <td>b2</td><td>Determine certain physical parameters of respiration in lung and the concentration of selected constituents in urine.</td></tr> <tr> <td>b3</td><td>Know how the different type of cells could react against the antigens.</td></tr> <tr> <td>b4</td><td>Demonstrate the interaction between the natural and adaptive immunity.</td></tr> </table>	b1	Describe gaseous transport in the blood, different mechanisms dealing with hemopoiesis, blood coagulation, osmoregulation and salt balance process.	b2	Determine certain physical parameters of respiration in lung and the concentration of selected constituents in urine.	b3	Know how the different type of cells could react against the antigens.	b4	Demonstrate the interaction between the natural and adaptive immunity.										
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c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>Determine & understand the anatomy & physiology of the respiratory and excretory system.</td></tr> <tr> <td>c2</td><td>Demonstrate & understand the properties & function of different blood constituents.</td></tr> <tr> <td>c3</td><td>Utilize different scientific approaches & recent technology for solving biological problems in immunology (differential white cell count, microscopic structure of lymphoid tissues & some experiments to show how the antibody reacts against the antigen).</td></tr> </table>	c1	Determine & understand the anatomy & physiology of the respiratory and excretory system.	c2	Demonstrate & understand the properties & function of different blood constituents.	c3	Utilize different scientific approaches & recent technology for solving biological problems in immunology (differential white cell count, microscopic structure of lymphoid tissues & some experiments to show how the antibody reacts against the antigen).												
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d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Work effectively both in a team, and independently on solving problems.</td></tr> <tr> <td>d2</td><td>Apply the concepts of biology in his daily life, like referring of diseases to certain troubles in the function of body organs.</td></tr> <tr> <td>d3</td><td>Communicate effectively with his teacher and colleagues.</td></tr> <tr> <td>d4</td><td>Use the Internet to find information</td></tr> </table>	d1	Work effectively both in a team, and independently on solving problems.	d2	Apply the concepts of biology in his daily life, like referring of diseases to certain troubles in the function of body organs.	d3	Communicate effectively with his teacher and colleagues.	d4	Use the Internet to find information										
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4-Contents	<table border="1"> <tr><td>1</td><td>Structural function of respiratory system</td></tr> <tr><td>2</td><td>Physical & Chemical aspects of respiration</td></tr> <tr><td>3</td><td>Regulation of respiration</td></tr> <tr><td>4</td><td>Structural function of excretory system</td></tr> <tr><td>5</td><td>Renal handling of different substances</td></tr> <tr><td>6</td><td>Body fluid compartments & composition</td></tr> <tr><td>7</td><td>Blood constituents and functions</td></tr> <tr><td>8</td><td>Hemostasis & hemopoiesis</td></tr> <tr><td>10</td><td>Basic concepts of immunology</td></tr> </table>	1	Structural function of respiratory system	2	Physical & Chemical aspects of respiration	3	Regulation of respiration	4	Structural function of excretory system	5	Renal handling of different substances	6	Body fluid compartments & composition	7	Blood constituents and functions	8	Hemostasis & hemopoiesis	10	Basic concepts of immunology
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	11	Innate Immunity	
	12	Acquired Immunity	
	13	Cells and Organs of the Immune System	
	14	Antigens // MHC	
	15	Immunoglobulins : Structure & Function	
	16	Antigen-Antibody Interactions	
	17	Complement // Cytokines	
	18	Hypersensitivity Reactions	
	19	Detection of haemin crystals	
	20	Packed cell volume (Haematocrite value)	
	21	Quantitative determination of blood haemoglobin (Sahli method)	
	22	Enumeration of red blood corpuscles by Heamocytometer	
	23	Blood groups & coagulation time	
	24	Determination of lung volumes by water spirometer	
	25	Estimation of blood gases by Haidane apparatus	
	26	pathological urine	
	27	Types of WBC (differential count using Gemisa stain)	
	28	Dissecting animal models to clear the lymphatic organs.	
	30	Study the microscopic structure of lymphoid tissues.	
	31	ImmunoAssays: Precipitin Reactions	
5- Teaching and learning method	1	lecture (Data show projectors)	☐
	2	Students' contributions to discussions on lecture materials.	☐
	3	Tutorial exercises compose of a mixture of multiple choice-type and short questions, practical tasks.	☐
	4	Encourage students to use online and library resources.	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Practical Examination		
	3	Mid-Term Examination		
	4	Oral Examination.		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Practical Examination	14	
	3	Mid-Term Examination	8	
	4	Oral Examination.	10	
c-Weighting of Assessments	1	Final-term Examination	55	73.33%
	2	Practical Examination	15	20.00%
	3	Mid-Term Examination	2.5	3.33%
	4	Oral Examination.	2.5	3.33%
8-List of References				
a-Course notes	1	Power point slides		
b-Essential Books(text books)	1	Essentials of Anatomy and Physiology / Edition 4 by Frederic H. Martini, Edwin F. Bartholomew		
c-Suggested Books	1	Human Physiology (Gillian Pocock & Christopher D.Richards)		
	2	Essential Endocrinology (Brook &Marshall, Blackwell science)		
d-Scientific periodicals or Publications	1	http://wps.pearsoned.it/fisiologia_uma5/165/42312/10831893.cw/index.html		
	2	http://wps.aw.com/bc_martini_eap_4/40/10467/2679558.cw/index.html		

Matrix of knowledge and skills of the course



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Faculty of Science

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Structural function of respiratory system	1	a1 ,	b1 ,		d1 , d2 , d3 , d4 ,
2	Physical & Chemical aspects of respiration	2	a1 ,	b1 , b2 ,		d1 , d2 , d3 , d4 ,
3	Regulation of respiration	3	a1 ,	b1 , b2 ,		d1 , d2 , d3 , d4 ,
4	Structural function of excretory system	4	a1 , a2 ,	b1 , b2 ,		d1 , d2 , d3 , d4 ,
5	Renal handling of different substances	5,6	a2 ,	b1 ,		d1 , d2 , d3 , d4 ,
6	Body fluid compartments & composition	7-9	a2 ,	b1 ,		d1 , d2 , d3 , d4 ,
7	Blood constituents and functions	10,11	a2 ,	b1 ,		d1 , d2 , d3 , d4 ,
8	Hemostasis & hemopoiesis	12,13	a1 , a2 ,	b1 ,		d1 , d2 , d3 , d4 ,
10	Basic concepts of immunology	1	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
11	Innate Immunity	2	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
12	Acquired Immunity	3	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
13	Cells and Organs of the Immune System	4,5	a3 ,	b3 , b4 ,		
14	Antigens // MHC	6	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
15	Immunoglobulins : Structure & Function	8,9	a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
16	Antigen-Antibody Interactions	10,11				
17	Complement // Cytokines	12	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
18	Hypersensitivity Reactions	13,14	a1 , a3 ,	b3 , b4 ,		d1 , d2 , d3 , d4 ,
19	Detection of haemin crystals	1			c2 ,	d1 , d2 , d3 , d4 ,



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20	Packed cell volume (Haematocrite value)	2			c2 ,	d1 , d2 , d3 , d4 ,
21	Quantitative determination of blood haemoglobin (Sahli method)	3				
22	Enumeration of red blood corpuscles by Heamocytometer	4			c2 ,	d1 , d2 , d3 , d4 ,
23	Blood groups & coagulation time	5			c2 ,	d1 , d2 , d3 , d4 ,
24	Determination of lung volumes by water spirometer	6			c1 ,	d1 , d2 , d3 , d4 ,
25	Estimation of blood gases by Haidane apparatus	7			c1 ,	d1 , d2 , d3 , d4 ,
26	pathological urine	8			c1 ,	d1 , d2 , d3 , d4 ,
27	Types of WBC (differential count using Gemisa stain)	10			c3 ,	d1 , d2 , d3 , d4 ,
28	Dissecting animal models to clear the lymphatic organs.	11			c3 ,	d1 , d2 , d3 , d4 ,
30	Study the microscopic structure of lymphoid tissues.	12			c3 ,	d1 , d2 , d3 , d4 ,
31	ImmunoAssays: Precipitin Reactions	13			c3 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr. Naglaa El-Sayed Rifaat Ismael and Azza Ali Saed

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For

Marine biology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z471	Title	Marine biology			Level	4	Semester	2
Lecture (h/w)	2	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	3		

2- Overall aims of the course

1	This course introduces students to the common forms of life inhabiting the seas and oceans. Physical and chemical characters of sea water will first be introduced. Human impacts on the marine environment and current issues in marine biology will also be discussed. The interest of this course arises in part from a growing awareness of the ocean's importance to humanity in providing living and non-living resources

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	enumerate the major groups that exists in marine ecosystem.
	a2	describe and illustrate the structure, function, niche and adaptation of marine organisms.
	a3	give an account of the human interaction with and in the marine environment
	a4	summarize living and non-living resources of the seas.
	a5	state the use of marine life as food



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b- Intellectual skills: At the end of the course the student should be able to:	b1	analyze and compare the dangerous of some marine organisms.
	b2	interpret and link the importance of marine resource management and policy for the protection , restoration and enhancement of marine ecosystems
c-Professional and practical skills: At the end of the course the student should be able to:	c1	identify ,find and analyze information needed for solving a problem and writing field or laboratory report
d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)
	d2	interact with other people and to engage in team –working.
4-Contents	1	Introduction of marine environment
	2	Chemistry of sea water
	3	The zooplankton
	4	Oceanic nekton
	5	Floatation mechanism of marine organisms
	6	Intertidal ecology
	7	Deep-sea biology
5- Teaching and learning method	1	lecture ☒
6- Teaching and learning methods for students with limited capacity		Not Available.
7-Student Assessment Methods		
a-Using Assessment	1	Final-term Examination
	2	Practical Examination
	3	Mid-term Examination
	4	Oral Examination



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b-Assessment Schedule	1	Final-term Examination	15	
	2	Practical Examination	13	
	3	Mid-term Examination	8	
	4	Oral Examination	10	
c-Weighting of Assessments	1	Final-term Examination	55	73.33%
	2	Practical Examination	15	20.00%
	3	Mid-term Examination	2.5	3.33%
	4	Oral Examination	2.5	3.33%
8-List of References				
a-Course notes				
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction of marine environment	1, 2	a1 , a2 ,	b1 ,	c1 ,	d1 ,
2	Chemistry of sea water	3-6	a2, a3 ,	b1, b2	c1 ,	d1 ,
3	The zooplankton	7	a4 ,	b1 ,	c1,	d1 ,
4	Oceanic nekton	8	a2 , a3 ,a4 , a5 ,	b1, b2 ,	c1 ,	d1 , d2 ,
5	Flootation mechanism of marine organisms	9, 10	a2 , a4 ,	b1 , b2 ,	c1 ,	d2 ,
6	Intertidal ecology	11, 12	a2 , a4 ,	b1 , b2 ,	c1 ,	d1 ,



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7	Deep-sea biology	13,14	a1 , a2 , a4 , a5 ,	b1 , b2 ,	c1 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Khalid H. Zaghloul**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Chemistry of Carbohydrates (2)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C437	Title	Chemistry of Carbohydrates (2)			Level	4	Semester	1
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: To introduce the students to the basics of Carbohydrate in chemistry. Then use this as basis to approach compounds both in industry and biologically

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recognize the types of Carbohydrates.
	a2	Know the industrial importance of carbohydrates.
	a3	Identify the chemical structures and conformations of mono-, di- and poly-saccharides.
	a4	Identify the characteristics of mono-, di- and poly-saccharides.
	a5	Recognize the characteristic chemical reactions of mono-, di- and poly-saccharides.
	a6	Know the general methods for structure determinations.
	a7	Identify characteristics and preparation of Ascorbic acid.



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>b1</td><td>Discuss the classification of carbohydrates.</td></tr> <tr><td>b2</td><td>Distinguish between different classes of carbohydrates.</td></tr> <tr><td>b3</td><td>Differentiate between the structures of different disaccharides.</td></tr> <tr><td>b4</td><td>Describe the behavior of mono-, di- and poly-saccharides in chemical reactions.</td></tr> </table>	b1	Discuss the classification of carbohydrates.	b2	Distinguish between different classes of carbohydrates.	b3	Differentiate between the structures of different disaccharides.	b4	Describe the behavior of mono-, di- and poly-saccharides in chemical reactions.								
b1	Discuss the classification of carbohydrates.																
b2	Distinguish between different classes of carbohydrates.																
b3	Differentiate between the structures of different disaccharides.																
b4	Describe the behavior of mono-, di- and poly-saccharides in chemical reactions.																
c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>c1</td><td>Distinguish the types of carbohydrates practically.</td></tr> <tr><td>c2</td><td>Apply chemical reactions in determination of carbohydrates.</td></tr> <tr><td>c3</td><td>Apply chemical reactions in characterization of carbohydrates</td></tr> <tr><td>c4</td><td>Apply chemical reactions in preparation of ascorbic acid.</td></tr> </table>	c1	Distinguish the types of carbohydrates practically.	c2	Apply chemical reactions in determination of carbohydrates.	c3	Apply chemical reactions in characterization of carbohydrates	c4	Apply chemical reactions in preparation of ascorbic acid.								
c1	Distinguish the types of carbohydrates practically.																
c2	Apply chemical reactions in determination of carbohydrates.																
c3	Apply chemical reactions in characterization of carbohydrates																
c4	Apply chemical reactions in preparation of ascorbic acid.																
d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>d1</td><td>Discuss different chemical behaviors of carbohydrates.</td></tr> <tr><td>d2</td><td>Develop independent investigative skills by using textbooks and other sources (Library,..)</td></tr> <tr><td>d3</td><td>Work effectively individually or as part of a team.</td></tr> <tr><td>d4</td><td>Utilize problem solving skills in a variety of theoretical and practical situations.</td></tr> <tr><td>d5</td><td>Plan the work and meet deadlines.</td></tr> <tr><td>d6</td><td>Collect, record, analyze and interpret data from a range of sources.</td></tr> <tr><td>d7</td><td>Use information technology applications.</td></tr> <tr><td>d8</td><td>Make report with discussion in this subject .</td></tr> </table>	d1	Discuss different chemical behaviors of carbohydrates.	d2	Develop independent investigative skills by using textbooks and other sources (Library,..)	d3	Work effectively individually or as part of a team.	d4	Utilize problem solving skills in a variety of theoretical and practical situations.	d5	Plan the work and meet deadlines.	d6	Collect, record, analyze and interpret data from a range of sources.	d7	Use information technology applications.	d8	Make report with discussion in this subject .
d1	Discuss different chemical behaviors of carbohydrates.																
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d6	Collect, record, analyze and interpret data from a range of sources.																
d7	Use information technology applications.																
d8	Make report with discussion in this subject .																
4-Contents	<table border="1"> <tr><td>1</td><td>Introduction: classification and importance of carbohydrates</td></tr> <tr><td>2</td><td>Monosaccharaides: -Types (acetates, sulfonates, phosphates) -Chemical conformations -Characteristics -Chemical reactions</td></tr> <tr><td>3</td><td>Disaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions</td></tr> </table>	1	Introduction: classification and importance of carbohydrates	2	Monosaccharaides: -Types (acetates, sulfonates, phosphates) -Chemical conformations -Characteristics -Chemical reactions	3	Disaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions										
1	Introduction: classification and importance of carbohydrates																
2	Monosaccharaides: -Types (acetates, sulfonates, phosphates) -Chemical conformations -Characteristics -Chemical reactions																
3	Disaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions																



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	4	Polysaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions		
	5	Characteristic and preparation of Ascorbic acid		
	6	Revision		
5- Teaching and learning method	1	lecture		☐
	2	Discussion.		☐
	3	Homework		☐
6- Teaching and learning methods for students with limited capacity				Not Available.
7-Student Assessment Methods				
a-Using Assessment	1	Final written Exam		
	2	Mid-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Final written Exam	15	
	2	Mid-Term Examination	8	
	3	Oral Examination	12	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Final written Exam	35	70.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students by chemistry department.		



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b-Essential Books(text books)	1	Organic chemistry, I., L Finar, (volume 1), 5th edition, Longman, London, 1982.
c-Suggested Books		
d-Scientific periodicals or Publications	1	Online scientific journals

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction: classification and importance of carbohydrates	1	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 ,
2	Monosaccharaides: -Types (acetates, sulfonates, phosphates) -Chemical conformations -Characteristics -Chemical reactions	2-4	a3 , a4 , a5 , a6 ,	b3 , b4 ,	c1 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 ,
3	Disaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions	5-7	a3 , a4 , a5 , a6 ,	b3 , b4 ,	c1 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 ,
4	Polysaccharides: -Types -Chemical conformations -Characteristics -Chemical reactions	9-11	a3 , a4 , a5 , a6 ,	b3 , b4 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 ,
5	Characteristic and preparation of Ascorbic acid	12	a7 ,		c1 , c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 ,
6	Revision	13				

Course Coordinator Prof. Dr. Mamdouh Ahmed Mohamed Taha

Program Coordinator Prof. Dr. Ehab Moaz Abouzied



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Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Chemistry of Natural products**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C426	Title	Chemistry of Natural products		Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	To understand the basic concepts of UV and visible light.
2	To understand the relation between Hook's law and infra-red.
3	To study the principle of proton magnetic resonance and ¹³ C NMR, and Mass spectroscopy.
4	Understand the basic concepts of dyes and heterocyclic chemistry.
5	Qualifying the students to synthesize different types of heterocycles and dyes.
6	to introduce the students to the fundamental Polymerization, Thermoplastic and thermosetting polymers and linear polymer
7	to familiarize the students with the basic concepts of petrochemicals especially the seven principle chemicals derived from petroleum and the natural gas, the chemical processes for manufacturing industrial chemicals.
8	to introduce the students to the fundamental of Dyes especially, color and valence bond, theory of dyes, application, classification and nomenclature of dyes.
9	to familiarize the students with the basic concepts of organic chemistry especially the chemistry of hydrocarbon monoterpenes, alconolic terpenes, ketonic terpenes and bicyclic terpenes



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3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recognize the relation between color and concentration of organic compounds.
	a2	Determination the functional group of organic compound
	a3	Recognize the different protons of organic compounds and ^{13}C - atom.
	a4	Recognize structure of organic compound by mass spectroscopy.
	a5	know propertises natural products(Terpenes)
	a6	Developed an interdisciplinary understanding of the principles of a systems
	a7	Recognize subject-specific theories, concepts and principles.
	a8	determine color and valence bond
	a9	use theory of dyes.
	a10	use, classification and nomenclature of dyes.
	a11	Recognize the seven principle chemicals derived from petroleum and the natural gas.
	a12	Know the chemical processes for manufacturing industrial chemicals.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Determine the concentration of compounds
	b2	Identify the different protons and carbon-13 atom.
	b3	Indemnify the function group such as $-\text{OH}$ -, $\text{C}-$, C-H , C=N , C=C etc.
	b4	Use the different apparatus of UV and visible, NMR, and mass spectroscopy.
	b5	Classify terpenes.
	b6	Relate the properties of different terpenes.
	b7	Describe differences between different terpenes.
	b8	Correlate structure and properties of different types of polymer
	b9	Synthesize, analyze and evaluate information.
	b10	Differentiate between different processes techniques.
	b11	Classify different dyes according to application
	b12	Classify different dyes according to chemical structures.



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	b13	Describe the source of principle chemicals derived from petroleum.
	B14	Write chemical equation describing the production of industrial chemicals
c-Professional and practical skills: At the end of the course the student should be able to:	c1	self learning
	c2	Synthesis different types of organic compound
	c3	Approach to academic literature and other sources of information
	c4	Describe the different Polymerization techniques.
	c5	Identify different types of dyes.
	c6	Different processes for manufacturing industrial chemicals.
	c7	Acquainted with produce the petrochemicals.
	c8	Know the importance of petroleum for fuels petrochemical product.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team.
	d2	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)
	d3	Plan and implement efficient modes of working.
	d4	Interact with other people and to engage in team –working.
	d5	Explain different chemical reactivity of heterocycles.
	d6	Collect, record, analyze and interpret data from a range of sources.
	d7	Demonstrate flexibility when solving numerical and other complex appropriate techniques.
	d8	Use information technology applications.
	d9	Develop independent investigative skills by using textbooks and other sources (Library,..)
	d10	Work effectively individually or as part of a team.
	d11	Develop independent investigative skills by using different sources of learning (Text books, Internet, Library, fruitful discussion,...).
	d12	Plain work and meet deadlines.
	d13	Communicate fluently in oral and writing.



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4-Contents

1	Organic chemistry Spectroscopy
2	Introduction
3	UV, visible light
4	Infra-red
5	¹ HNMR
6	¹² CNMR
7	Mass spectrometer
8	Problems
9	NATURAL products(terpenes)
10	Hydrocarbon monoterpenes
11	Alconolic terpenes.
12	Aldehydic terpenes
13	Ketonic terpenes
14	Monocyclic terpenes
15	Bicyclic terpenes
16	Vitamine A
17	Carotenes
18	Organic(Polymer)
19	Polymerization. Thermoplastic and thermosetting polymers, Linear polymer.
20	Molecular weight distribution in polymers,
21	Physical properties of polymers.
22	Crystalline and non crystalline regions in polymer mass, Cellulose plastics.
23	Vinyl and related thermoplastics.
24	Polyethylene , polypropylene , polyvinyl chloride
25	Polystyrene , Polymethylmethacrylate.
26	Polytetrafluoroethylene.
27	Thermosetting resins, phenol-formaldehyde resins, Amine-formaldehyde resins.



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28	Polyester resins.
29	Synthetic fibers.
30	Rubbers, natural and synthetic.
31	High-temperature polymers
32	Dyes
33	Colour Dyes and pigments ,Wittt's Theory of Colour , Modern Theory of Colour, Colour and Absorption of light, Colour and Conjugated Systems.
34	Theories of Colour (A) Valence Bond Approach to Colour (B) Molecular Orbital Approach to Colour Ultra- Violet and Visible Spectroscopy.
35	Factors affecting on the colour phototropy (photochromism), Fastness properties of Dye
36	Theory of Dyeing .Mechanism of dyeing, methods of Dyeing, application of dyes. classification of dyes.
37	Classification of dyes Classification according to application. Classification according to chemical structure
38	Nomenclature of dyes Nitroso Dyes, Nitro Dyes, Azodyes, Diarylmethane Dyes, Triphenylmethane Dyes, Xanthene Dyes, Acridine Dyes, Quinoline Dyes, Azine Dyes, Vat Dyes, Anthraquinoid Dyes, Sulphur Dyes.
39	Questions,
40	Chemistry of Petroleum
41	Introduction, start of petrochemical industry.
42	Chemicals from methane.
43	Chemicals from acetylene.
44	Chemicals from acetylene.
45	Chemicals from C-4 hydrocarbons.
46	Chemicals from propylene.
47	Chemicals from aromatic hydrocarbons.



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5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Lectures notes and hand out notes to the students par by part.	
b-Essential Books(text books)	1	Finar, volume 2,by Moreson &Boyed,2000.	
c-Suggested Books			
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Organic chemistry Spectroscopy	1-4				
2	Introduction		A1	B1	C1	D2
3	UV, visible light		A1	B1	C2	D2



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4	Infra-red		A2	B3	C2	D2
5	¹ HNMR		A3	B2	C2	D2
6	¹² CNMR		A3	B2	C2	D2
7	Mass spectrometer		A4	B4	C2	D2
8	Problems		A4	B4	C1	D1
9	NATURAL products(terpenes)	5-8				
10	Hydrocarbon monoterpenes		A5	B5		d3, d4,d5
11	Alconolic terpenes.		A5	B7		d3, d4,d5
12	Aldehydic terpenes		A5	B7		d3, d4,d5
13	Ketonic terpenes		A5	B7		d3, d4,d5
14	Monocyclic terpenes		A5	B7		d3, d4,d5
15	Bicyclic terpenes		A5	B7		d3, d4,d5
16	Vitamine A		A5	B6		d3, d4,d5
17	Carotenes		A5	B6		d3, d4,d5
18	Organic(Polymer)	9-11				
19	Polymerization. Thermoplastic and thermosetting polymers, Linear polymer.		A7	B8	C4	
20	Molecular weight distribution in polymers,		A7	B8	C4	
21	Physical properties of polymers.		A7	B8	C4	
22	Crystalline and non crystalline regions in polymer mass, Cellulose plastics.		A6	B10	C3	
23	Vinyl and related thermoplastics.		A6	B10	C3	
24	Polyethylene , polypropylene , polyvinyl chloride		A6	B10	C3	
25	Polystyrene , Polymethylmethacrylate.		A6	B10	C3	
26	Polytetrafluoroethylene.		A6	B10	C3	



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27	Thermosetting resins, phenol-formaldehyde resins, Amine-formaldehyde resins.		A6	B10	C3	
28	Polyester resins.		A6	B9	C4	
29	Synthetic fibers.		A6	B9	C4	
30	Rubbers, natural and synthetic.		A6	B9	C4	
31	High-temperature polymers		A6	B9	C4	
32	Dyes	12-14				
33	Colour Dyes and pigments ,Wittt's Theory of Colour , Modern Theory of Colour, Colour and Absorption of light, Colour and Conjugated Systems.		A8	B11	C5	D9
34	Theories of Colour (A) Valence Bond Approach to Colour (B) Molecular Orbital Approach to Colour Ultra- Violet and Visible Spectroscopy.		A8	B11	C5	D9
35	Factors affecting on the colour phototropy (photochromism), Fastness properties of Dye		A8	B12	C5	D9
36	Theory of Dyeing .Mechanism of dyeing, methods of Dyeing, application of dyes. classification of dyes.		A9	B12	C5	D9
37	Classification of dyes Classification according to application. Classification according to chemical structure		A10	B12	C5	D9



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38	Nomenclature of dyes Nitroso Dyes, Nitro Dyes, Azodyes, Diarylmethane Dyes, Triphenylmethane Dyes, Xanthene Dyes, Acridine Dyes, Quinoline Dyes, Azine Dyes, Vat Dyes, Anthraquinoid Dyes, Sulphur Dyes.		A10		C5	D9
39	Questions,		A10	B12	C5	D10
40	Chemistry of Petroleum					
41	Introduction, start of petrochemical industry.		A12	B13	C6	D11
42	Chemicals from methane.		A11	B14	C8	D13
43	Chemicals from acetylene.		A11	B14	C7	D13
44	Chemicals from acetylene.		A11	B14	C7	D13
45	Chemicals from C-4 hydrocarbons.		A11	B14	C7	D13
46	Chemicals from propylene.		A11	B14	C7	D12
47	Chemicals from aromatic hydrocarbons.		A11	B14	C7	D13

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For **Petroleum and its products chemistry**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C424	Title	Petroleum and its products chemistry		Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	to familiarize the students with the basic concepts of petrochemicals especially the seven principle chemicals derived from petroleum and the natural gas, the chemical processes for manufacturing industrial chemicals

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recognize the seven principle chemicals derived from petroleum and the natural gas.
	a2	Understand the chemical processes for manufacturing industrial chemicals.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe the source of principle chemicals derived from petroleum.
	b2	Write chemical equation describing the production of industrial chemicals.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Different processes for manufacturing industrial chemicals.
	c2	Acquainted with produce the petrochemicals
	c3	Know the importance of petroleum for fuels petrochemical product.



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d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop independent investigative skills by using different sources of learning (Text books, Internet, Library, fruitful discussion,...).		
	d2	Plain work and meet deadlines.		
	d3	Communicate fluently in oral and writing.		
4-Contents	1	Introduction, start of petrochemical industry.		
	2	Chemicals from methane.		
	3	Chemicals from acetylene.		
	4	Chemicals from C-4 hydrocarbons		
	5	Chemicals from propylene.		
	6	Chemicals from aromatic hydrocarbons.		
5- Teaching and learning method	1	Lecturer	☐	
	2	Discussion.	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examinatio		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examinatio	15	
	3	Oral Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	10.00%
	2	Final-term Examinatio	20	80.00%
	3	Oral Examination	2.5	10.00%



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8-List of References		
a-Course notes	1	Lectures notes and hand out notes to the students part by part
b-Essential Books(text books)	1	Finar, volume 2,by Moreson & Boyed,2000.
c-Suggested Books		
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction, start of petrochemical industry.	1,2	a2 ,	b1 ,	c1 ,	d1 ,
2	Chemicals from methane.	3,4	a1 ,	b2 ,	c3 ,	d3 ,
3	Chemicals from acetylene.	5,6	a1 ,	b2 ,	c2 ,	d3 ,
4	Chemicals from C-4 hydrocarbons	7,9	a1 ,	b2 ,	c1 , c2 ,	d3 ,
5	Chemicals from propylene.	10,11	a1 ,	b2 ,	c1 , c2 ,	d2 ,
6	Chemicals from aromatic hydrocarbons.	12,13	a1 ,	b2 ,	c1 , c2 ,	d3 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For

Molecular Spectroscopy (A)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C433	Title	Molecular Spectroscopy (A)		Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	1	

2- Overall aims of the course

1	The course provides an introduction to the basics and applications of the interaction of electromagnetic radiation with matter. The basics of different types of spectra and the quantum mechanical principles of the corresponding spectroscopic techniques will be discussed. The course will show the mutual relationship between spectroscopic studies and understanding the structure of atoms and molecules. Student will learn the applications of molecular spectroscopies in the determination of structure and bonding of chemical compounds. Focus will be on electronic, vibrational and rotational spectroscopy.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Recognize properties of electromagnetic radiation and its interaction with matter
	a2	Understand the quantum structure of matter and Learn the connection between quantum mechanics and spectroscopy
	a3	Understand the phenomena of lasing and identifies different types of lasers.
	a4	Understand and apply Selection rules of electronic transitions.
	a5	Define the role of vibronic coupling in electronic transitions.
	a6	realize the behavior of molecular states under magnetic fields



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		and the related spectra
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify and explain the nature of the transitions induced when specific wavelengths of light interact with matter.
	b2	Analyse molecular spectroscopic data and conduct calculations relating to the properties of molecules.
	b3	Interpret spectra (from one of more spectroscopic techniques) so as to identify molecular characteristics and/or to determine the full structure of molecules.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Able to conduct calculations in a confident and reliable manner.
	c2	Select molecular spectroscopy methods suitable for solving given scientific problem.
	c3	Analyze results of measurements using molecular spectroscopy methods
	c4	Develop Atomic and molecular electronic states
	c5	Develop and apply Selection rules of molecular vibrations and rotations.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop independent investigative skills by using textbooks and other sources (Library...)
	d2	Work effectively individually or as part of a team.
	d3	Plan their work and meet deadlines.
	d4	write a report.
4-Contents	1	Nature of electromagnetic radiation, classical and quantum description of the radiation absorption/emission by matter, quantum theory of matter, the Born-Oppenheimer approximation and different molecular energies (electronic, vibrations and rotations of molecules) and spectra associated with each.
	2	Rotational spectroscopy – classical description of molecular rotation, quantum mechanics of molecular motion, rotational spectra, determination of the bond length from rotational constants, selection rules, rotational spectra of polyatomic molecules



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	3	Vibrational spectroscopy – classical description of molecular vibrations, the classical harmonic oscillator, quantum mechanics of molecular vibration, vibrational selection rules, anharmonic vibrations and Morse oscillator, bond dissociation energies, calculation of force constants from vibrational spectrum, rotational structure in vibrational spectra of diatomic molecules, vibrational selection rules, vibration of polyatomic molecules, normal modes, characteristic group vibrational energies.	
	4	Raman Spectroscopy – description of Raman scattering, Rayleigh scattering, Stokes and anti-Stokes scattering , polarizability of the molecules, selection rules for rotational Raman spectra of diatomic molecules, rotational Raman spectra, vibrational Raman spectra, Raman spectra of polyatomic molecules	
	5	Electronic Spectroscopy – electronic transition, energy of electronic transition, selection rules, the Franck-Condon principle, term symbols for describing atomic and molecular states, Russel-Saunders spin-orbit coupling, selection rules of electronic transition, absorption intensity, probability of light absorption, an electronic spectrum, classification of electronic transition, d-d and CT transitions	
	6	Spectra in magnetic field – NMR – nuclear spin angular momentum, the magnetic moment of a nucleus, the nuclei in a magnetic field, the Larmor frequency, the chemical shift, electronic shielding of nuclei, the chemical shift scale, the spin-spin coupling, the spin-spin coupling constant, spin-spin splitting, molecular structure from NMR spectra. EPR Spectroscopy – paramagnetic species, electron spin, magnetic properties of the electron and selected particles, magnetogyric ratio, electron spin-orbit couplings, energy levels and allowed EPR transitions	
	7	Revision	
5- Teaching and learning method	1	lecture	☐
	2	Open discussion.	☐
	3	Scientific Visits.	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final Examination	
	2	Mid-Term Examination	



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	3	semester work		
b-Assessment Schedule	1	Final Examination	15	
	2	Mid-Term Examination	8	
	3	semester work	on all weeks	
c-Weighting of Assessments	1	Final Examination	20	80.00%
	2	Mid-Term Examination	2.5	10.00%
	3	semester work	2.5	10.00%
8-List of References				
a-Course notes	1	Notes and slides prepared by the lecturer		
b-Essential Books(text books)	1	Peter W. Atkins – Physical Chemistry, eighth Edition, New York, 2006, Chapters 10-15, page 320-560.		
	2	Michael Hollas – Basic Atomic and Molecular Spectroscopy, RSC 2002		
c-Suggested Books	1	Atkins, P.W.; Friedman, R.S. Molecular Quantum Mechanics, 3rd Ed.; Oxford University Press: New York, 1999		
d-Scientific periodicals or Publications	1	Papers distributed or assigned as convenient		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Nature of electromagnetic radiation, classical and quantum description of the radiation absorption/emission by matter, quantum theory of matter, the Born-Oppenheimer approximation and different	1,2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,



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	molecular energies (electronic, vibrations and rotations of molecules) and spectra associated with each.					
2	Rotational spectroscopy – classical description of molecular rotation, quantum mechanics of molecular motion, rotational spectra, determination of the bond length from rotational constants, selection rules, rotational spectra of polyatomic molecules	3	a ₂ , a ₃ ,	b ₁ , b ₂ , b ₃ , b ₃ ,	c ₁ , c ₂ ,	d ₁ , d ₂ , d ₃ ,
3	Vibrational spectroscopy – classical description of molecular vibrations, the classical harmonic oscillator, quantum mechanics of molecular vibration, vibrational selection rules, anharmonic vibrations and Morse oscillator, bond dissociation energies, calculation of force constants from vibrational spectrum, rotational structure in vibrational spectra of diatomic molecules, vibrational selection rules, vibration of polyatomic molecules, normal modes, characteristic group vibrational energies.	4-5	a ₂ , a ₃ ,	b ₁ , b ₂ , b ₃ ,	c ₁ , c ₅ ,	d ₁ , d ₂ , d ₃ ,



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4	Raman Spectroscopy – description of Raman scattering, Rayleigh scattering, Stokes and anti-Stokes scattering , polarizability of the molecules, selection rules for rotational Raman spectra of diatomic molecules, rotational Raman spectra, vibrational Raman spectra, Raman spectra of polyatomic molecules	7,8	a ₂ , a ₃ ,	b ₁ , b ₂ , b ₃ ,		d ₁ , d ₂ , d ₃ ,
5	Electronic Spectroscopy – electronic transition, energy of electronic transition, selection rules, the Franck-Condon principle, term symbols for describing atomic and molecular states, Russel-Saunders spin-orbit coupling, selection rules of electronic transition, absorption intensity, probability of light absorption, an electronic spectrum, classification of electronic transition, d-d and CT transitions	9,10	a ₂ , a ₄ , a ₅ ,	b ₁ , b ₂ , b ₃ ,	c ₁ , c ₂ , c ₄ ,	d ₁ , d ₂ , d ₃ ,



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6	Spectra in magnetic field – NMR – nuclear spin angular momentum, the magnetic moment of a nucleus, the nuclei in a magnetic field, the Larmor frequency, the chemical shift, electronic shielding of nuclei, the chemical shift scale, the spin-spin coupling, the spin-spin coupling constant, spin-spin splitting, molecular structure from NMR spectra. EPR Spectroscopy – paramagnetic species, electron spin, magnetic properties of the electron and selected particles, magnetogyric ratio, electron spin–orbit couplings, energy levels and allowed EPR transitions	11,13	a2 , a6 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c5 ,	d1 , d2 , d3 ,
7	Revision	14				

Course Coordinator Prof. Dr. **Mohamed R Saber**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Chemistry of Surface&Catalysis(1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C447	Title	Chemistry of Surface&Catalysis(1)			Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	To know the different between surface and interfacial tension and the wetting and non wetting agents, different types of adsorption and adsorption equation isotherm, different type of catalysis Homogeneous and Heterogeneous and its applications.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand the different types of adsorption
	a2	Compare between Homogeneous and Heterogeneous catalysis.
	a3	Know the application of adsorption in catalysis
	a4	Use the catalyst in Homogeneous and Heterogeneous reactions.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Differentiate between different types of adsorption.
	b2	Solve the problems related to surface area and surface tension..
	b3	Measure (Volumetric and Gravimetric) the quantity of adsorption.
	b4	Derive the different types of adsorption equation (monolayer-multilayer).



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Drive the different kinetic equation for adsorption..	
	c2	Measure the amount of the adsorbed gas.	
	c3	Design the catalyst suitable for the reaction	
	c4	Calculate the Reaction rate in homogenous and Heterogeneous catalysis.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Solve the different problems.	
	d2	Work in a team	
	d3	Apply the different theory of catalysis and adsorption on the production scale.	
4-Contents	1	Surface Liquid- gas interface surface tension	
	2	Liquid – solid interface wetting non witting agents.	
	3	Liq- liq interface interfacial	
	4	Gas- solid interface adsorption application of adsorption	
	5	Homogeneous catalysis	
	6	Heterogeneous catalysis	
	7	Colloidal solution	
	8	Application of catalysis	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Practical.	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity		Not Availiable.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Lectures notes and hand out notes to the students part by part.	
b-Essential Books(text books)	1	Physical chemistry, G.Vemulapall, 1993.	
	2	Physical chemistry P.W Atkins (L.b.E) 1982.	
c-Suggested Books			
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Surface Liquid- gas interface surface tension	1-3	a1 ,	b1 , b2 , b3 ,	c2 , c1 , c3 ,	d1 ,
2	Liquid – solid interface wetting non witting agents.	4	a1 ,	b1 , b3 ,	c2 , c3 ,	d2 , d1 ,
3	Liq- liq interface interfacial	4,5	a1 ,	b2 ,	c2 , c1 , c3 ,	d2 , d1 ,
4	Gas- solid interface adsorption application of adsorption	5	a1 ,	b1 , b4 ,	c3 , c4 ,	d2 , d1 ,



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5	Homogeneous catalysis	6,7	a2 ,	b2 , b4 ,	c2 , c1 ,	d2 , d1 ,
6	Heterogeneous catalysis	8-11	a3 ,	b1 , b3 ,	c2 , c1 , c4 ,	d2 , d1 ,
7	Colloidal solution	11-13	a3 ,	b2 , b4 ,	c1 , c3 , c4 ,	d1 , d3 ,
8	Application of catalysis	14	a4 ,	b3 , b4 ,	c3 , c4 ,	d1 , d3 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB

SELECTIV COURSES
FOR
LEVEL 3 AND 4



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Course Specification For

Radio Biology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z311	Title	Radio Biology			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)			

2- Overall aims of the course

1	Supplying the student with basic information about the types of radiation and their biological effects

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Theories and fundamentals related to the field of learning as well as in related fields
	a2	Mutual influence between professional practice and its impacts on the environment
	a3	Scientific developments in the field of specialization
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze and evaluate information in the field of specialization and measurement for the solution of problems
	b2	The link between the various professional knowledge to solve problems
	b3	Risk assessment in the professional practices in the area of specialization



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Master the basic and modern professional skills in the area of specialization	
	c2	Write and evaluation of professional reports	
	c3	Methods and tools to assess the list in the area of specialization	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Effective communication in its different forms	
	d2	Use of information technology to serve the professional practice	
	d3	Self-evaluation and identifying personal educational needs	
	d4	Using different sources to get the information and knowledge	
	d5	Work in a team, and the leadership teams in different contexts Egyptian	
	d6	Self and continuous learning	
4-Contents	1	Introduction	
	2	Biological effects of radiation	
	3	Radiation effects on the molecules of interest in biological systems	
	4	The effect of radiation on chromosomes DNA	
	5	Effect of radiation on the membranes Energy metabolism	
	6	The effect of radiation on cell division	
	7	The effect of radiation on the members of organs in mammals	
	8	The effect of radiation on blood	
5- Teaching and learning method	1	lecture to develop the knowledge and understand	☐
	2	Discussion to initiate critical thinking and to let the students know how to work in team	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.		
7-Student Assessment Methods					
a-Using Assessment					
b-Assessment Schedule					
c-Weighting of Assessments					
8-List of References					
a-Course notes		1	The handout prepared by the instructor		
b-Essential Books(text books)		1	Chapman, R.F. (2002): The Insects: Structure and Function		
		2	The English Universities Press Ltd.		
		3	Imms, General Textbook of Entomology		
		4	Fundamentals of Entomology.Richard J.Elzinga.		
		5	The world of insects Chinery,Michae		
c-Suggested Books		1	Gullan ,P.J.andCranston ,P.S. (2000):The insects:An outline of Entomology 2nd edition. Blak well Science,Inc		
		2	Grzimek,s Animal Life Encyclopedia		
d-Scientific periodicals or Publications		1	www.sciencedirect.com		
		2	www.pubmed.com		
		3	www.google.com		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction		a1 ,	b1 ,	c1 ,	d1 , d3 , d4 ,
2	Biological effects of radiation		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,



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3	Radiation effects on the molecules of interest in biological systems		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,
4	The effect of radiation on chromosomes DNA		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,
5	Effect of radiation on the membranes Energy metabolism		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,
6	The effect of radiation on cell division		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,
7	The effect of radiation on the members of organs in mammals		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,
8	The effect of radiation on blood		a1 , a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d2 , d4 , d5 ,

Course Coordinator Prof. Dr. **Ayman Mustafa Abdel-Aziz**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Fish Physiology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z384	Title	Fish Physiology			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course provides the students with comprehensive education and essential knowledge in physiological status of fish to be qualified for public sector and real job market especially in the field of fisheries fish farms management. Furnish ground for students to be recognized nationally through out starting achievements related to environmental affairs. Moreover, it helps the students in understanding fish physiology. Fish growth and development, determination of fish growth. Reproduction and factors affecting both growth and reproduction in fish. Growth and reproduction in shell fish and its measurement. Different shapes and designs of fish in relation to aquatic environment. Structure of organs, tissues, cells and organelles in relation to their function.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain the various fish parts used in age determination
	a2	Understand the importance and application of fish growth and knowledge to fisheries
	a3	Describe the different types of fish shapes in relation to their environment
	a4	Describe the different types oExplain Structure of organs,



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		tissues, cells and organelles in relation to their function.
	a5	Understand fish reproduction
	a6	Understand fish migration and factors affecting it
	a7	Understand the unique physiological characteristics and adaptations that allow fish to survive and thrive in an aquatic environment
	a8	Understand the consistencies and variations in the characteristics of physiological systems within and between fish groups and with other vertebrates
b- Intellectual skills: At the end of the course the student should be able to:	b1	Engagement with current developments in the biosciences and their application
	b2	Appreciation of the complexity and diversity of life processes through the study of organisms.
	b3	Undertake field and/or laboratory studies of living systems
	b4	Undertake practical work to ensure competence in basic experimental skills.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	gain hands-on experience with fish physiology core concepts such as anatomy, morphology, locomotion, bioenergetics, reproductive physiology and behavior
	c2	conduct activities and experiments in a supervised laboratory setting where they will apply scientific method for discovery
d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop independent investigative skills by using textbooks and other sources (Internet, Library,...)
	d2	interact with other people and to engage in team –working
4-Contents	1	Basic structural features of fishes
	2	Sensory systems and communication
	3	Locomotion and buoyancy
	4	Feeding and Digestion
	5	Growth and metabolism
	6	Reproduction



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	7	Cardiovascular system		
	8	Gas Exchange, acid-base regulation		
	9	Osmoregulation and ion balance		
	10	Nitrogen excretion and metabolism		
	11	Central nervous system		
	12	Endocrine systems		
	13	Immune systems		
	14	Aquatic toxicology		
5- Teaching and learning method	1	lecture	☐	
	2	Open Discussion	☐	
	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-term Examination		
	2	Final-term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-term Examination	2.5	5.00%
	2	Final-term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%



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8-List of References		
a-Course notes	1	Hand out
	2	General notes by Staff members of Zoology Department
b-Essential Books(text books)	1	Stephen D. McCormick, Anthony Farrell, Colin Brauner (2013): Fish physiology, Edited by Stephen D. McCormick, Anthony Farrell, Colin Brauner Hardbound, 594 Pages Published: January 2013
	2	Katherine Sloman, Sigal Balshine, Rod Wilson (2005): Fish physiology, Behavior and physiology of fish: Edited by Katherine Sloman, Sigal Balshine, Rod Wilson Hardbound, 504 Pages Published: December 2005
c-Suggested Books	1	•Harry, W.E and Williams D.Y. (1992).Principles of Fishery Science .Second Edition. Comstock Publishing, Ithaca, London. 349p.
	2	Gupta S.K and Gupta P.C. (2006).General and applied Ichthyology.(Fish and Fisheries) Published by S. Chand & Company, India. 1133p.
	3	Adesulu E.A and Sydenham D.H.G (2007).The Fresh water Fishes and Fisheries on Nigeria. Macmillian Nigeria publishers, Nigeria. 397p
d-Scientific periodicals or Publications	1	Journal of Fish Biology - Environmental Biology of Fishes

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Basic structural features of fishes	1				
2	Sensory systems and communication	2				
3	Locomotion and buoyancy	3				



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4	Feeding and Digestion	4				
5	Growth and metabolism	5				
6	Reproduction	6				
7	Cardiovascular system	7				
8	Gas Exchange, acid-base regulation	8				
9	Osmoregulation and ion balance	9				
10	Nitrogen excretion and metabolism	10				
11	Central nervous system	11				
12	Endocrine systems	12				
13	Immune systems	13				
14	Aquatic toxicology	14				

Course Coordinator Prof. Dr. Khalid Hussein Zaghloul

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For

Advenced Histology (Elective)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z321	Title	Advenced Histology (Elective)			Level	3	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: -Teach students basic knowledge of cell ultra structure -Teach students ultrastruture of tissues and some organs and its function,. - In achieving this goal, a-students will be make quick better revision on histology to be able to understand the advanced histology. -They will also be better prepared for more advanced biomedical science courses.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	knowing difference between cell ultra-structures
	a2	knowing difference between human tissues from ultrastructure view
	a3	knowing the ultra-structure of human liver and kidney
	a4	knowing the deference between exocrine and endo crine glands and normal /abnormal functions
	a5	knowing the ultra-structure of sensory organs and read the cell electron microscopic figures



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b- Intellectual skills: At the end of the course the student should be able to:	b1	differentiate ultra-structure photos of different cells organals and in various organs	
	b2	suggest questions on studied parts	
	b3	Evaluate critically disease due to defects in endocrinology	
	b4	link information and deliver reports of high standard	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Differentiate between different organelles in the cell	
	c2	Use appropriate lab equipment to identify various types of tissues	
	c3	Identify the structure of the human liver and kidney by light and electron micrographs	
	c4	identify the structure of the some endocrine glands and its function	
	c5	identify the ultra-structure of the some sensory organs and its function	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Describe cell and tissues structural in accordance with the standard scientific guidelines	
	d2	work coherently and successfully as a part of a team in projects	
	d3	undertaken appropriate further professional training	
	d4	study and find information independently	
4-Contents	1	study some cytological fine structure (actins filament-microtubules-intermediate filament and basement membrane structure	
	2	study ultra structures of epithelium and connective tissues (junctional complex-fibroblast-collagen and elastic fibers-macrophage-mast cell-lymphocytes- adipocytes)	
	3	study ultra structure of cartilage-osteoblast-muscles and nerves	
	4	study fine structure of human liver and kidney by light and electron microscopes	
	5	endocrinology	
	6	memory land and sensory organs	
	7	oral and practical exams	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion.	☐



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	3	Homework		
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-Term Examination		
	3	Practical Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-Term Examination	8	
	3	Practical Examination	14	
	4	Oral Examination	14	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Practical Examination	10	20.00%
	4	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Notes By lecturer		
b-Essential Books(text books)	1	Basic histology-cell مكتبة كلية العلوم		
	2	tissue ultra stuctue مكتبة كلية العلوم		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills



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1	study some cytological fine structure (actins filament-microtubules-intermediate filament and basement membrane structure	1	a1 ,	b1 , b2 , b3 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 ,
2	study ultra structures of epithelium and connective tissues (junctional complex-fibroblast-collagen and elastic fibers-macrophage-mast cell-lymphocytes-adipocytes)	2	a2 ,	b1 , b2 , b4 ,	c1 , c2 ,	d1 , d2 , d3 , d4 ,
3	study ultra structure of cartilage-osteoblast-muscles and nerves	3	a1 , a2 ,	b1 , b2 , b4 ,	c1 , c2 , c4 ,	d1 , d2 , d3 , d4 ,
4	study fine structure of human liver and kidney by light and electron microscopes	4-7	a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c5 ,	d1 , d2 , d3 , d4 ,
5	endocrinology	9-11	a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c5 ,	d1 , d2 , d3 , d4 ,
6	memory land and sensory organs	12-13	a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c5 ,	d1 , d2 , d3 , d4 ,
7	oral and practical exams	14	a1 , a2 , a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr.

د. عبد الكريم محمد عبد اللطيف – د. هبه محمد ربيع

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For

Mollusca

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z332	Title	Mollusca			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	define general classification of Mollusca
	a2	explain different types of Mollusca
	a3	mention ultra structure details of different Mollusca
	a4	understand mechanism of life cycle
	a5	explain the mechanisms of protection
b- Intellectual skills: At the end of the course the student should be able to:	b1	clarify general systematic of different Mollusca
	b2	compare between different genera of Mollusca
	b3	deduce the mechanism of life cycle
	b4	interpret phenomena and effects in term of invertebrate principles, presenting arguments and ideas clearly and logically..



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	collect samples for analysis.	
	c2	preserve samples for analysis.	
	c3	separate different Molluscan species	
	c4	analyses and estimate each constituents	
	c5	dissect animals for finding parasites	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Learn how to search for an information using the library or internet. resources.	
	d2	work in groups	
	d3	learn time management	
	d4	present oral or written essay using appropriate language	
	d5	traning for collection of Mollusca	
	d6	traning for safty handling of Mollusca	
4-Contents	1	Intoduction and general characters of Mollusca	
	2	General classification and structure of protozoa	
	3	General classification and structure of helminthes	
	4	Studies the morphology and life cycle,pathogenicity and diagnosis of some examples of protozoa and helminthes and its vectors	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment	1	Mid-Term Examination	
	2	Final-Term Examination	
	3	Oral Examination	
	4	Practical Examination	



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b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Hand out		
	2	General notes by Staff members of Zoology Department (2015)		
b-Essential Books(text books)	1	Invertebrate Zoology: a Functional Evoluti		
c-Suggested Books	1	Invertebrate Zoology: Amazon.co.uk: E.L. Jordan, P.S. Verma		
d-Scientific periodicals or Publications	1	Invertebrate Zoology: a Functional Evolutionary Approach: Amazon ... www.amazon.co.uk260 × 314Search by image		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Intoduction and general characters of Mollusca					
2	General classification and structure of protozoa					
3	General classification and structure of helminthes					



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4	Studies the morphology and life cycle,pathogenicity and diagnosis of some examples of protozoa and helminthes and its vectors					

Course Coordinator Prof. Dr. **Dayhoum Al-Bassel**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For

Benthic animals

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z333	Title	Benthic animals			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	To provide students with comprehensive education and essential knowledge in benthic ecology and biology, to be qualified for public sector and real job market.
2	To furnish a ground for students to be recognized nationally throughout starting achievements related to environmental affairs

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate scientific facts, concepts, principles, theories and techniques related to the appropriate areas of benthic ecology
	a2	Interpret data and processes related to the structure and function of the marine benthos.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze biological qualitative and quantitative data with proper tools within a theoretical framework for assessments of benthic ecology
	b2	Assess the concepts, principles, procedures, theories and their interrelationships for solving marine benthos problems



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Implement field training and reporting for solving problems in benthic studies, considering responsibility and scientific ethics.	
	c2	Handle marine samples in appropriate forms considering	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Employ recent technologies, models and theories effectively in marine ecology field	
4-Contents	1	Introduction to Benthos	
	2	Benthos of the rocky shores	
	3	Benthos of the sandy shores	
	4	Benthos of the muddy shores	
	5	Coral reefs communities	
	6	The benthos of the deep sea	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Mid-Term Examination	
	2	Final-term Examination	
	3	Oral Examination.	
	4	Practical Examination	
b-Assessment Schedule	1	Mid-Term Examination	8
	2	Final-term Examination	15
	3	Oral Examination.	
	4	Practical Examination	14



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c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-term Examination	35	70.00%
	3	Oral Examination.	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Hand out		
	2	General notes by Staff members of Zoology Department		
b-Essential Books(text books)	1	McLachan, A. and Brown A.C. (2006). The ecology of sandy shores. Elsevier Inc		
c-Suggested Books	1	Elefteriou, A. and McIntyre, A. (2005). Methods for the Study of Marine Benthos. Balckwell Publishing Company Ltd. Oxford, UK		
d-Scientific periodicals or Publications	FSFU DB			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to Benthos	1, 2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 ,
2	Benthos of the rocky shores	3, 4	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 ,
3	Benthos of the sandy shores	5, 6	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 ,
4	Benthos of the muddy shores	7, 8				
5	Coral reefs communities	9-11	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 ,
6	The benthos of the deep sea	12-14	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 ,

Course Coordinator Prof. Dr.

Kandeel El-Sayed Kandeel Hashem



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Program Coordinator Prof. Dr.

Head of department: Prof. Dr.

Date: 2016

QA FSFU DB



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Course Specification For **Classification of animal**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z312	Title	Classification of animal		Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	Simplified knowledge about the foundations of the Classification in the animal kingdom
2	Studying the description of animal phyla.
3	Knowledge of the different classes under each animal phylum
4	Studying one animal as example from each class.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Study of classification (taxonomy basics).
	a2	Enumerate of animal phyla form protozoa to chordate.
	a3	Study protozoa (classification position and specifications)
	a4	Study parazoa (classification position and specifications)
	a5	Study metazoan (classification position and specifications)
	a6	Knowledge of the different classes to each phyla
b- Intellectual skills: At the end of the course the student should be able to:	b1	Skills in the description.
	b2	Identify the animal kingdom.
	b3	Skills in identify the difference between protozoa, parazoa and metazoan phylum.



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	<table> <tr> <td>b4</td><td>The ability to classify animals under each phylum.</td></tr> <tr> <td>b5</td><td>Interpret the subject knowledge and understanding the animal classes.</td></tr> <tr> <td>b6</td><td>The ability to classify animals under each class.</td></tr> </table>	b4	The ability to classify animals under each phylum.	b5	Interpret the subject knowledge and understanding the animal classes.	b6	The ability to classify animals under each class.										
b4	The ability to classify animals under each phylum.																
b5	Interpret the subject knowledge and understanding the animal classes.																
b6	The ability to classify animals under each class.																
c-Professional and practical skills: At the end of the course the student should be able to:	<table> <tr> <td>c1</td><td>Examine the related biological between protozoa, parazoa and metazoan phylum.,</td></tr> <tr> <td>c2</td><td>Practical training to slides of different phyla types -</td></tr> <tr> <td>c3</td><td>Design, plan, conduct and report on investigations, which may involve primary or secondary data</td></tr> <tr> <td>c4</td><td>Identified ultra-structure of different cells studied in various organs of phyla .</td></tr> <tr> <td>c5</td><td>activities and Homework.</td></tr> </table>	c1	Examine the related biological between protozoa, parazoa and metazoan phylum.,	c2	Practical training to slides of different phyla types -	c3	Design, plan, conduct and report on investigations, which may involve primary or secondary data	c4	Identified ultra-structure of different cells studied in various organs of phyla .	c5	activities and Homework.						
c1	Examine the related biological between protozoa, parazoa and metazoan phylum.,																
c2	Practical training to slides of different phyla types -																
c3	Design, plan, conduct and report on investigations, which may involve primary or secondary data																
c4	Identified ultra-structure of different cells studied in various organs of phyla .																
c5	activities and Homework.																
d-General and transferable skills: At the end of the course the student should be able to:	<table> <tr> <td>d1</td><td>The think independently to write structural reports in accordance with the standard scientific guidelines</td></tr> <tr> <td>d2</td><td>work coherently and successfully as a part of a team in projects</td></tr> <tr> <td>d3</td><td>An ability to undertaken appropriate further professional training</td></tr> <tr> <td>d4</td><td>Study and find information independently.</td></tr> </table>	d1	The think independently to write structural reports in accordance with the standard scientific guidelines	d2	work coherently and successfully as a part of a team in projects	d3	An ability to undertaken appropriate further professional training	d4	Study and find information independently.								
d1	The think independently to write structural reports in accordance with the standard scientific guidelines																
d2	work coherently and successfully as a part of a team in projects																
d3	An ability to undertaken appropriate further professional training																
d4	Study and find information independently.																
4-Contents	<table> <tr> <td>1</td><td>Basis of Animal Kingdom Classification, introduction of animal classification and General characters of Protozoa. Then study of one example.</td></tr> <tr> <td>2</td><td>General characters of parazoa , and study of three types of parazoa.</td></tr> <tr> <td>3</td><td>Classification of metazoan and study of their phyla. General characters, classification of Coelenterate.</td></tr> <tr> <td>4</td><td>General characters, classification of Platyhelminthes and life cycle of a class from Platyhelminthes.</td></tr> <tr> <td>5</td><td>General characters, classification of phylum Nematode and life cycle of any class from Nematode</td></tr> <tr> <td>6</td><td>General characters, classification of Annelida. and studies of some different species</td></tr> <tr> <td>7</td><td>General characters and classification of Arthropoda, General characters of different systems of Malacostraca , Branchiopoda , Ostracoda, Cirripedia and Copepoda</td></tr> <tr> <td>8</td><td>General characters , structure studies of different systems of Chilopoda and compare between it and Diplopoda</td></tr> </table>	1	Basis of Animal Kingdom Classification, introduction of animal classification and General characters of Protozoa. Then study of one example.	2	General characters of parazoa , and study of three types of parazoa.	3	Classification of metazoan and study of their phyla. General characters, classification of Coelenterate.	4	General characters, classification of Platyhelminthes and life cycle of a class from Platyhelminthes.	5	General characters, classification of phylum Nematode and life cycle of any class from Nematode	6	General characters, classification of Annelida. and studies of some different species	7	General characters and classification of Arthropoda, General characters of different systems of Malacostraca , Branchiopoda , Ostracoda, Cirripedia and Copepoda	8	General characters , structure studies of different systems of Chilopoda and compare between it and Diplopoda
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2	General characters of parazoa , and study of three types of parazoa.																
3	Classification of metazoan and study of their phyla. General characters, classification of Coelenterate.																
4	General characters, classification of Platyhelminthes and life cycle of a class from Platyhelminthes.																
5	General characters, classification of phylum Nematode and life cycle of any class from Nematode																
6	General characters, classification of Annelida. and studies of some different species																
7	General characters and classification of Arthropoda, General characters of different systems of Malacostraca , Branchiopoda , Ostracoda, Cirripedia and Copepoda																
8	General characters , structure studies of different systems of Chilopoda and compare between it and Diplopoda																



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	9	General characters and structure studies of different species of order (Chelicerata) Arachnoidea class (Scorpionidea,Araneida and Acarina)		
	10	General characters and structure studies of different species of Mollusca (Polyplacophora and Bivlvata).		
	11	General characters and structure studies of different species of Mollusca (Gastropoda and Cephalopoda).		
	12	General characters and structure studies of different species Echinodermata (Astrozoa and Echinozoa).		
	13	General characters and structure studies of different species (Holothurozoa and crinozoa).		
	14	General characters and classification of Phylum : Chordate into Subphylum Cephalochordate, Subphylum half of Chordates and Subphylum Urochordata, General characters and classification of Subphylum Vertebrata.		
	15	Revision		
5- Teaching and learning method	1	lecture		☐
	2	Open Discussion		☐
	3	Scientific Visits		☐
6- Teaching and learning methods for students with limited capacity				Not Avialible.
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Practical Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Practical Examination	13	
	4	Oral Examination	10	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Practical Examination	10	20.00%



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	4	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Invertebrate Protozoa-parazoa –coelenterate –platyhelminses – Nematode –Annelida –Arthropods – Mollusca –Echinodermata .- Chordata.		
c-Suggested Books	1	General Zoology		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Basis of Animal Kingdom Classification, introduction of animal classification and General characters of Protozoa. Then study of one example.	1	a1 , a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
2	General characters of parazoa , and study of three types of parazoa.	2	a4 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
3	Classification of metazoan and study of their phyla. General characters, classification of Coelenterate.	3	a1 , a2 , a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,



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4	General characters, classification of Platyhelminthes and life cycle of a class from Platyhelminthes.	4	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
5	General characters, classification of phylum Nematode and life cycle of any class from Nematode	5	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
6	General characters, classification of Annelida. and studies of some different species	6	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
7	General characters and classification of Arthropoda, General characters of different systems of Malacostraca , Branchiopoda , Ostracoda, Cirripedia and Copepoda	7	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
8	General characters , structure studies of different systems of Chilopoda and compare between it and Diplopoda	8	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
9	General characters and structure studies of different species of order (Chelicerata) Arachnoidea class (Scorpionidea, Araneida and Acarina)	9	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
10	General characters and structure studies of different species of Mollusca (Polyplacophora and Bivlvata).	10	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,



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11	General characters and structure studies of different species of Mollusca (Gastropoda and Cephalopoda).	11	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
12	General characters and structure studies of different species Echinodermata (Astrozoa and Echinozoa).	12	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
13	General characters and structure studies of different species (Holothurozoa and crinozoa).	13	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
14	General characters and classification of Phylum : Chordate into Subphylum Cephalochordate, Subphylum half of Chordates and Subphylum Urochordata, General characters and classification of Subphylum Vertebrata.	14	a5 , a6 ,	b1 , b2 , b3 , b4 , b5 , b6 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 ,
15	Revision	14	a6 ,	b5 , b6 ,	c5 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr. **Diaa Fawzi Mohammed Mahmoud**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Insect physiology

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z352	Title	Insect physiology			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Study the structure and function of different insect systems.
2	Application of physiological information in different fields of science

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	to recognize the different insect body structures
	a2	to investigate the function of the different organs of insect systems
	a3	to identify the adaptation of insect organs to fit their habitate..
b- Intellectual skills: At the end of the course the student should be able to:	b1	to interpret the physiological functions of the different regions of the insect systems
	b2	to compare between the organs function in different insects .
c-Professional and practical skills: At the end of the course the student should be able to:	c1	examine the different insect system constituents to investigate by experiments the functions of different insect systems.
	c2	investigate by experiments the functions of different insect systems.



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	c3	relate between the physiological functions and adaptation to environment.
d-General and transferable skills: At the end of the course the student should be able to:	d1	assist student to work in groups
	d2	communicate with each other in preparing reports
	d3	to relate knowledge to insect control problems as community linked thinking
4-Contents	1	Introduction, overview on the basic structure of the integument. Different types of the cuticle
	2	Moulting & formation of new cuticle
	3	Hardening of the cuticle. Sclerotization & hormonal control.
	4	Function of the cuticle.
	5	Structure of the digestive system Extraintestinal digestion.
	6	Absorption - Efficiency of food utilization
	7	Overview on the Structure of respiratory system. Ventilation & gas exchange.
	8	Control of ventilation. Cyclic release of CO ₂ .
	9	Respiration in aquatic & parasitic insects. Excretory system & homeostasis. - Excretory products
	10	Maintenance of hemo lymph ionic level in terrestrial & aquatic insects. Water regulation in terrestrial & aquatic insects. - Structure of circulatory system & circulation
	11	Heart beat & control. - Hemolymph & hemocyte. - Plasma: Blood volume & inorganic constituents. - Osmotic pressure & osmoregulation
	12	Reproduction, Oogenesis: Structure of ovarioles, -Types of ovarioles, Functions, Vitellogenesis: Yolk deposition. - vitelline membrane formation and egg shell control of oogenesis - Ovulation.
	13	Spermatogenesis, Testis structure, Sperm capacitation, Control of spermatogenesis, Muscle Performance and Locomotion: Muscle contraction
	14	Control of contraction. Muscular control in the intact insect Locomotion; oscillation of antagonistic pairs of muscles. Signal Transmission and Conduction



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5- Teaching and learning method	1	lecture using data show ,projector, and board		☐
	2	Home works, reports and discussion groups		☐
	3	Lab work		☐
6- Teaching and learning methods for students with limited capacity				Not Availiable.
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	The insects structure & function. By R.F. Chapman (1998), 4th ed. Cambridge University Press.		
	2	- Insect Physiology & Biochemistry. James L. Nation (2002). CRC Press. (London. New York, Washington D. C.		
c-Suggested Books	1	The Principles of Insect Physiology. V. B. Wigglesworth (1972) 7th ed. Chapman & Hall.		
	2	The Physiology of Insecta. Morris Rockstein (1964). Academic Press Inc. (London).		



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d-Scientific periodicals or Publications	1	Journal of insect physiology

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction, overview on the basic structure of the integument. Different types of the cuticle	1	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
2	Moulting & formation of new cuticle	2	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
3	Hardening of the cuticle. Sclerotization & hormonal control.	3	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
4	Function of the cuticle.	4	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
5	Structure of the digestive system Extraintestinal digestion.	5	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
6	Absorption - Efficiency of food utilization	6	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
7	Overview on the Structure of respiratory system. Ventilation & gas exchange.	7	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
8	Control of ventilation. Cyclic release of CO ₂ .	8	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
9	Respiration in aquatic & parasitic insects. Excretory system & homeostasis. - Excretory products	9	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,



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10	Maintenance of hemo lymph ionic level in terrestrial & aquatic insects. Water regulation in terrestrial & aquatic insects. - Structure of circulatory system & circulation	10	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
11	Heart beat & control. -Hemolymph & hemocyte. - Plasma: Blood volume & inorganic constituents. - Osmotic pressure & osmoregulation	11	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
12	Reproduction, Oogenesis: Structure of ovarioles, - Types of ovarioles, Functions, Vitellogenesis: Yolk deposition. -vitelline membrane formation and egg shell control of oogenesis - Ovulation.	12	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
13	Spermatogenesis, Testis structure, Sperm capacitation, Control of spermatogenesis, Muscle Performance and Locomotion: Muscle contraction	13	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
14	Control of contraction. Muscular control in the intact insect Locomotion; oscillation of antagonistic pairs of muscles. Signal Transmission and Conduction	14	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr.

Mayada Mosaed Ghareeb

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied



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Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

Biodiversity

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z313	Title	Biodiversity			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: to build cross-disciplinary understanding of biodiversity science

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	To know a general idea about biodiversity concept
	a2	To recognize the economic value of biodiversity
	a3	know factors affecting biodiversity
	a4	recognize the importance of biodiversity
	a5	Assess and contrast the factors and threatening processes responsible for the extinction of organisms
	a6	Integrate the theoretical basis of conservation management into current practices and problems
	a7	Compare and contrast methods for the conservation of biodiversity
	a8	Evaluate current and potential conservation problems



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Integrate the concept of biodiversity into their understanding of ecological systems and processes	
	b2	Evaluate the various ways that biodiversity can be measured	
	b3	Integrate knowledge of biodiversity and conservation into their major study	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Demonstrate the main features of biodiversity	
	c2	Differentiate between different levels of biodiversity.	
	c3	know the steps being taken to preserve biodiversity.	
	c4	Analyses of the importance of protected areas for conservation	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Exchange ideas, principles and information by oral, written and visual means.	
	d2	Work effectively both in a team and independently.	
	d3	Use the information technology to gather information and right report	
4-Contents	1	Introduction, Biodiversity Concepts and types of Biodiversity	
	2	Factors affecting biodiversity	
	3	Importance of biodiversity	
	4	Biodiversity in developing and advanced countries	
	5	The economic values of the biodiversity projects in the developing countries	
	6	The factors responsible for the extinction of organisms	
	7	Effort to preserve biodiversity	
	8	Evaluate current and potential conservation problems.	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion	☐
	3	Scientific Visits	☐



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6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Practical Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Practical Examination	13	
	4	Oral Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Practical Examination	10	20.00%
	4	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Notes on biodeversity		
b-Essential Books(text books)	1	Biodiversity by: K. H. Batanouny, (2001), Egyptian Academy of Scientific Research.		
c-Suggested Books	1	Hunter Jr., M. L. (1996) What is Biodiversity? pp. 19-31 In Fundamentals of Conservation Biology. Blackwell.		
	2	Purvis and Hector (2000) Getting the measure of biodiversity. Nature 405:212-219.		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction, Biodiversity Concepts and types of Biodiversity		a1 ,	b1 ,	c1 ,	d1 , d2 , d3 ,
2	Factors affecting biodiversity		a3 ,	b2 ,	c2 ,	d1 , d2 , d3 ,
3	Importance of biodiversity		a4 ,			d1 , d2 , d3 ,
4	Biodiversity in developing and advanced countries		a4 ,			d1 , d2 , d3 ,
5	The economic values of the biodiversity projects in the developing countries		a2 ,			d1 , d2 , d3 ,
6	The factors responsible for the extinction of organisms		a5 ,			d1 , d2 , d3 ,
7	Effort to preserve biodiversity		a7 ,	b3 ,	c3 ,	d1 , d2 , d3 ,
8	Evaluate current and potential conservation problems.		a6 , a8 ,	b3 ,	c4 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr. **Noha Ibrahim Said Salem**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Insect Ecology and Behavior

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z353	Title	Insect Ecology and Behavior			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The natural activity periods of the insect Communities During the year round
2	determine where and at what time one can collect definite insect species
2	Expect the types of insects within each habitat (desert, cultivated and aquatic
4	is to distinguish between harmful and beneficial species of insects

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	know the factors which affect or limit the insect distribution during year round
	a2	Enumerate the characteristic habitat features of common insects
b- Intellectual skills: At the end of the course the student should be able to:	b1	interpret the subject knowledge and understanding to solve a problem
	b2	confirm results with different scientific based issues
	b3	explore the reactions between different insect communities in biological control of some pests



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	design, plan, conduct and report on investigations, which may involve primary or secondary data (e.g. from a survey database	
	c2	obtains, record, collect and analyze data using appropriate techniques in the field and/or laboratory	
	c3	Plan for collecting definite species at right time and correct habitat	
d-General and transferable skills: At the end of the course the student should be able to:	d1	think independently, set tasks and solve problems on ethical scientific basis.	
	d2	consider community linked ethics and traditions	
	d3	use effectively scientific models, systems, and tools.	
4-Contents	1	Ecosystem	
	2	Auto-ecology	
	3	Syn-ecology	
	4	A-Biotic factors affecting insect activities: Temperature	
	5	Relative humidity, wind velocity & rainfall	
	6	Interaction between individuals in a population	
	7	Interaction between different insect communities: 1- Commensalism	
	8	Symbiosis & mutualism	
	9	Carnivores: Predators, Parasitoids & Scavengers	
	10	Insect Plant relation-ship - Insect Human relation-ship	
5- Teaching and learning method	1	Interactive presentations (Lectures with discussion)	☐
	2	Brainstorms	☐
	3	Practical sections	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final_Term Examination		
	2	Final_Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Final_Term Examination	15	
	2	Final_Term Examination	8	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Final_Term Examination	35	70.00%
	2	Final_Term Examination	2.5	5.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Insect Ecology: Behavior, Populations and Communities By P. W. Price, R. F. Denno, M. D. Eubanks, D. L. Finke, I. Kaplan		
	2	Insect Ecology: An Ecosystem Approach By Timothy D. Schowalter, 2000.		
	3	Southwood, Ecological census techniques, 1974		
	4	Insect Physiological Ecology:Mechanisms and Patterns: Mechanisms and Patterns By Steven L. Chown, Sue Nicolson		
b-Essential Books(text books)				
c-Suggested Books	1	Insect Pest Management And Ecological Research By Gimme Hugh Walter.		



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d-Scientific periodicals or Publications	1	http://www.sciencedirect.com/
	2	http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed
	3	Wikipedia
	4	youtube.com
	5	Google e-books

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Ecosystem	1	a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
2	Auto-ecology	2	a2 ,	b1 , b3 ,	c1 , c2 , c3 ,	d1 , d3 ,
3	Syn-ecology	3	a1 , a2 ,	b1 , b3 , b1 , b3 ,	c1 , c2 , c3 ,	d1 , d2 ,
4	A-Biotic factors affecting insect activities: Temperature	4, 5	a1 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d3 ,
5	Relative humidity, wind velocity & rainfall	6, 7	a1 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d3 ,
6	Interaction between individuals in a population	8, 9	a2 ,	b2 , b3 ,	c1 , c2 ,	d1 , d3 ,
7	Interaction between different insect communities: 1- Commensalism	10	a1 , a2 ,	b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
8	Symbiosis & mutualism	11	a1 , a2 ,	b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
9	Carnivores: Predators, Parasitoids & Scavengers	12, 13	a1 , a2 ,	b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
10	Insect Plant relation-ship - Insect Human relation-ship	14	a1 , a2 ,	b1 , b2 , b3 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr. **Ehab M. Abouzied**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Insect Metabolism**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z354	Title	Insect Metabolism			Level	3	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The primary focus of this course is on the pathways of intermediary metabolism by which all cells synthesize and degrade carbohydrates, lipids (fats), and nitrogenous compounds
2	We will examine the chemistry of the reactions that constitute these pathways and discuss how energy is derived from the breakdown of nutrients.
3	We will also discuss how metabolic pathways are regulated by effect or molecules and by hormones in living systems. Finally, we will consider how several human diseases arise from defects in metabolic pathways, and we will review papers in the scientific literature on several diseases linked to altered metabolism

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	do some background reading and generate a hypothesis
	a2	design a study to test the hypothesis
	a3	write an informed consent document to study insect subjects
	a4	perform the study using each other as research subjects
	a5	analyze the resulting data
	a6	present the results to the class in both oral and written form



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b- Intellectual skills: At the end of the course the student should be able to:	b1	understand the basic molecular properties of 3 of the 4 classes of biological molecules (proteins, carbohydrates, and lipids) and the subunits from which they are formed. (Nucleotides are covered more in depth in other courses).
	b2	understand acid/base chemistry as it applies to biological molecules.
	b3	describe the network of chemical reactions that make up central metabolism.
	b4	describe the catalytic functions of enzymes, and perform enzyme kinetics calculations.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	pick a relevant, doable research question and frame it as a testable hypothesis
	c2	choose an appropriate study design
	c3	write the informed consent document
	c4	oversee data collection
	c5	analyze and interpret the data (provide basic statistical consulting)
	c6	craft a clear, concise presentation of the study to the rest of the class
d-General and transferable skills: At the end of the course the student should be able to:	d1	read and understand scientific literature pertaining to subject matter in biochemistry.
	d2	discuss an assay using different tools, like data show and videos
4-Contents	1	Introduction (Catabolism and anabolism)
	2	Carbohydrates and Glycobiology
	3	Glycolysis & Gluconeogenesis
	4	Citric Acid Cycle
	5	Fatty Acid Catabolism
	6	Amino Acid Oxidation, Urea Cycle
	7	Oxidative Photophosphorylation
	8	Carbohydrate Biosynthesis
	9	Lipid Biosynthesis



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	10	Mitochondrial transport,oxidative stress and ATP synthesis		
	11	Cuticle synthesis and sclerotization		
	12	Metabolic regulation and hormonal control		
5- Teaching and learning method	1	lecture	☐	
	2	Open Discussion	☐	
	3	Open Discussion	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
	4	Practical Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)				
c-Suggested Books	1	Principles of Biochemistry. Lehninger, 6th Ed. (2013) (W. H. Freeman)		



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d-Scientific periodicals or Publications	1	Web Site: www.pitt.edu/~jbrodsky/biosc1820/

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction (Catabolism and anabolism)	1	a1 ,	b3 , b4 , b1 ,	c1 ,	d1 ,
2	Carbohydrates and Glycobiology	2	a1 , a2 , a6 ,	b4 , b1 , b2 ,	c1 , c2 , c4 , c6 ,	d1 , d2 ,
3	Glycolysis & Gluconeogenesis	3	a1 , a5 , a6 ,	b3 , b4 , b1 ,	c1 ,	d1 ,
4	Citric Acid Cycle	4	a1 , a2 , a3 , a5 , a6 ,	b3 , b4 , b1 , b2 ,	c1 ,	d1 ,
5	Fatty Acid Catabolism	5	a1 , a2 , a6 ,	b3 , b4 , b1 , b2 ,	c1 , c2 , c5 ,	d1 ,
6	Amino Acid Oxidation, Urea Cycle	6	a1 , a5 , a6 ,	b3 , b4 , b1 , b2 ,	c1 , c3 , c4 , c6 ,	d1 ,
7	Oxidative Photophosphorylation	7	a1 , a5 , a6 ,	b4 , b1 , b2 ,	c1 , c3 , c5 , c6 ,	d1 ,
8	Carbohydrate Biosynthesis	8	a1 , a2 , a6 ,	b3 , b4 , b1 ,	c1 , c3 , c5 ,	d1 ,
9	Lipid Biosynthesis	9	a1 , a4 , a6 ,	b3 , b2 , b1 ,	c1 , c4 , c6 ,	d1 , d2 ,
10	Mitochondrial transport, oxidative stress and ATP synthesis	10	a1 , a2 , a3 , a6 ,	b3 , b4 , b1 ,	c1 , c2 , c4 , c6 ,	d1 , d2 ,
11	Cuticle synthesis and sclerotization	11, 12	a1 , a2 , a3 ,	b3 , b4 , b1 ,	c1 , c3 , c6 ,	d1 , d2 ,
12	Metabolic regulation and hormonal control	13, 14	a1 , a4 , a6 ,	b3 , b4 , b1 , b2 ,	c1 , c4 , c6 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Ehab M. Abouzied**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**



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Course Specification For

Animal behavior

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z373	Title	Animal behavior			Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course is designed to introduce students to basic concepts
2	Acquire the theoretical background and experience of laboratory and field work that will prepare them for future career in animal behavior and its application to applied fields (e.g. animal welfare, conservation).
3	Be familiar with applications of experimental design, data collection and interpretation in the field and laboratory in behavioral studies.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate basic scientific facts, concepts, principles, techniques and applications related to animal behavior.
	a2	Describe processes and physiological mechanisms supporting the structure and function of animal behavior.
	a3	identify the ecological and evolutionary pressures that shape behavior
	a4	Represent examples for types of interrelationships between organisms' behavior and their environment.
	a5	List theories and methods applied for interpreting and analyzing animal behavioral data.



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	a6	Formulate answerable questions about animal behavior
	a7	Think critically about behavioral patterns and processes
b- Intellectual skills: At the end of the course the student should be able to:	b1	Assess interrelationships between the basic biology, diversity, ecology, evolution and behavior of animal groups.
	b2	Interpret experimental data and relevant literature for analyzing and solving problems.
	b3	Criticize scientific theories and concepts for appropriate decision making.
	b4	Work in a team to collect specific information
	b5	Use information and communication technology effectively
	b6	Think independently
	b7	Acquire self- and long life-learning.
	b8	Apply scientific models, systems, and tools effectively.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Implement appropriate biological techniques in behavioral studies following ethical and safety considerations.
	c2	Analyze the diversity and interdependence of behavior of animals, and detect the general characteristics, especially for Egyptian fauna.
	c3	Utilize different scientific approaches and recent technology for solving biological problems in animal behavior.
d-General and transferable skills: At the end of the course the student should be able to:	d1	Employ recent communication and information technologies, models and tools effectively in different tasks related to animal behavior.
	d2	Lead team work effectively for solving problems; appreciating the values of independent thinking, continuous learning, time management and ethics.
4-Contents	1	Introduction: Course Overview; Course Goals; History of Animal Behavior
	2	Background Information: Evolution & Natural Selection; Fitness & Adaptation; Levels & Units of Selection.
	3	Behaviorism and major types of animal behavior
	4	Mating relationships: courtship display, monogamous, polygamous, and polayandry.
	5	Innate behavior: reflex action, facial expression, and super-stimulus



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	6	Fixed Action pattern (FAP), taxis, kinesis, migration, and imprinting.	
	7	Learned behavior: operant and classical conditioning, habituation, and insight learning.	
	8	Social behavior: Dominance hierarchy, defensive action, aggression, Altruistic behavior, Territoriality, and mating behavior.	
	9	Animal communications: definition, importance, basic components, channels, and types	
	10	Nonverbal communications: definition, forms, and personal space.	
	11	Visual communications: Postures, facial expression, threat display, hierarchy signal, visual communications in insects, and mating display.	
	12	Chemical communications: pheromones, Costs and Benefits; Dominance; Territoriality	
	13	Auditory Communication: Animal instrumentalists, and echolocation.	
	14	Tactile Communication: electrical signals, and surface vibration	
5- Teaching and learning method	1	Lecturer	☒
	2	Open discussion	☒
	3	Data show	☒
	4	Board	☒
	5	Internet access activity	☒
	6	Video films and clips	☒
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final-term Examination	to assess the overall skills
	2	Oral Exam	to assess Knowledge and understandings.
	3	Midterm examination	to assess the overall skills.
	4	2.Practical examination	to assess Professional Skills.
b-Assessment Schedule	1	Final-term Examination	15
	2	Oral Exam	according to faculty's exam schedule



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	3	Midterm examination	8	
	4	2.Practical examination		
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Oral Exam	2.5	5.00%
	3	Midterm examination	2.5	5.00%
	4	2.Practical examination	10	20.00%
8-List of References				
a-Course notes	1	prepared by Dept. stuff		
b-Essential Books(text books)	1	Tomecek, Stephen M (2009). Animal communication. Infobase Publishing.		
	2	Slater, P.J.B. (1999). Essentials of animal behaviour. (Cambridge Univ. Press). 233 pages.		
c-Suggested Books	1	Grier JW & T Burk, 1992. Biology of Animal Behaviour. Mosby Year Book, St. Louis		
	2	2.Judith Goodenough, Betty McGuire, and Elizabeth Jakob (2010): Perspectives on Animal Behavior, 3 rd Ed. John Wiley & Sons, Inc.		
d-Scientific periodicals or Publications	1	library Periodicals, Web sites, ... etc		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction: Course Overview; Course Goals; History of Animal Behavior	1	a1 , a3 ,	b1 , b2 , b5 ,	c1 ,	d1 , d2 ,



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2	Background Information: Evolution & Natural Selection; Fitness & Adaptation; Levels & Units of Selection.	2	a1 , a2 , a3 , a4 ,	b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
3	Behaviorism and major types of animal behavior	3	a1 , a3 , a5 ,	b1 , b2 , b6 ,	c1 , c2 , c3 ,	d1 , d2 ,
4	Mating relationships: courtship display, monogamous, polygamous, and polayandry.	4	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b8 ,	c1 , c2 , c3 ,	d1 , d2 ,
5	Innate behavior: reflex action, facial expression, and super-stimulus	5	a1 , a2 , a3 , a4 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
6	Fixed Action pattern (FAP), taxis, kinesis, migration, and imprinting.	6	a1 , a2 , a3 , a6 ,	b1 , b2 , b4 ,	c1 , c2 ,	d1 , d2 ,
7	Learned behavior: operant and classical conditioning, habituation, and insight learning.	7	a1 , a2 , a3 , a7 ,	b1 , b2 , b7 ,	c1 , c2 , c3 ,	d1 , d2 ,
8	Social behavior: Dominance hierarchy, defensive action, aggression, Altruistic behavior, Territoriality, and mating behavior.	8	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
9	Animal communications: definition, importance, basic components, channels, and types	9	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,
10	Nonverbal communications: definition, forms, and personal space.	10	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,



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11	Visual communications: Postures, facial expression, threat display, hierarchy signal, visual communications in insects, and mating display.	11	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,
12	Chemical communications: pheromones, Costs and Benefits; Dominance; Territoriality	12	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,
13	Auditory Communication: Animal instrumentalists, and echolocation.	13	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,
14	Tactile Communication: electrical signals, and surface vibration	14	a1 , a2 , a3 , a5 , a6 ,	b1 , b2 , b6 ,	c1 , c2 ,	d1 , d2 ,

Course Coordinator Prof. Dr.

Diaa F. Massoud

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For **Environmental Pollution**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z375	Title	Environmental Pollution			Level	3	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The aim of this course to provide a broad, in-depth overview of important environmental health science issues (e.g., environmental pollutants, toxic chemicals, air and water quality, solar and ionizing radiation, ecosystem degradation) and how these issues impact animals and hence human being.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	mention the basic concepts of Environmental pollution.
	a2	determine the main types of pollutants.
	a3	describe the environment of factors affecting animal distribution
	a4	realize human impacts on natural resources
	a5	illustrate the food chain and pyramids of energy and their relation to pollutants
	a6	define characteristics of ecosystem.
	a7	realize the extent of pollution and its impact on life.
	a8	realize pollutants interaction.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	detect the relationships between biological diversity of a given community and its stability	
	b2	identify the human impact on natural resources and pollution.	
	b3	discuss the various animal adaptations to different ecosystems including desert ,water and other aquatic habitats exposed to pollutants	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	collect different samples from different habitats.	
	c2	investigate different pollutants .	
	c3	acquire hands- on practical skills.	
	c4	interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.	
	c5	draw relation between environmental factors and animal adaptations.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	plan and implement efficient modes of working.	
	d2	interact with other people and to engage in team –working.	
4-Contents	1	Introducing Environmental Pollution.	
	2	Relationships between pollutant exposure and toxic response	
	3	Toxic Metals and Elements	
	4	Environmental Organic Chemicals	
	5	Ionizing and Non-Ionizing Radiation	
	6	Water Quality	
	7	Air Pollution	
	8	Pollution and Global Change	
	9	Possible treatments of pollutants impact	
	10	Revision	
5- Teaching and learning method	1	lecture	✓
	2	Open Discussion.	✓



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	3	Scientific Visits	☒	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
	4	Practical Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	35	70.00%
	3	Oral Examination	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes	1	Hand out		
	2	General notes by Staff members of Zoology Department		
b-Essential Books(text books)	1	Chapman , J.I. and Reiss , M.J. (1995) : "Ecology , Principles and application" Cambridge University press.		
	2	- Richard Mayes, F (2001) : "Environment of Science" , printed in Singapore.		
	3	Friis, Robert H. Essentials of Environmental Health. Jones and Bartlett, Inc., Sudbury, MA. ISBN No. 0-7637-4762-9		
	4	Hill, Marquita K., Understanding Environmental Pollution, 2nd Edition. Cambridge University Press, Cambridge, UK.		
c-Suggested Books	1	Chapman , J.I. and Reiss , M.J. (1995) : "Ecology , Principles and application" Cambridge University press. 6.4- Periodicals, Web sites, ... etc		



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d-Scientific periodicals or Publications	1 Journals of Environmental Science

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introducing Environmental Pollution.	1	a1 , a2 ,			
2	Relationships between pollutant exposure and toxic response	2			c1 , c2 , c3 , c4 , c5 ,	
3	Toxic Metals and Elements	3	a3 , a4 ,			d1 ,
4	Environmental Organic Chemicals	4	a3 , a4 ,			d1 , d2 ,
5	Ionizing and Non-Ionizing Radiation	5	a3 , a4 ,			d1 , d2 ,
6	Water Quality	6	a6 ,	b1 , b3 ,		
7	Air Pollution	7	a6 ,	b1 , b2 , b3 ,		
8	Pollution and Global Change	8	a5 , a7 , a8 ,		c1 , c2 , c3 , c4 , c5 ,	d1 , d2 ,
9	Possible treatments of pollutants impact	9-13	a5 , a8 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 ,
10	Revision	14				

Course Coordinator Prof. Dr. **Khalid Hussein Zaghloul**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Pericyclic Reactions (Elective)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C327	Title	Pericyclic Reactions (Elective)		Level	3	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	In pericyclic chemistry, both a frontier molecular orbital approach and the concept of conservation of orbital symmetry will be applied to explain the observed reactivity and stereochemistry for this class of reactions. The Woodward–Hoffman rules governing all pericyclic processes will be developed and their use to predict the outcome of cycloadditions, electrocyclic processes, sigmatropic rearrangements and group transfer reactions will be demonstrated. Synthetic applications of these processes will also be illustrated.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand, be able to identify and draw the mechanisms for each of the different types of pericyclic reaction: cycloadditions, electrocyclic reactions, sigmatropic reactions and group transfer reactions
	a2	Be able to discuss how pericyclic reactions may be analysed in terms of the symmetry of the molecular orbitals involved leading to the concepts of allowed and forbidden reactions; be able to predict reaction outcome (including stereochemistry) by applying the Woodward–Hoffmann rules
	a3	Know and be able to identify the main thermally allowed (Diels



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		Alder, 1,3- dipolar) and photochemically allowed (2+2) cycloadditions. Exo vs endo selectivity, the Alder rule, regiochemical outcomes and substituent effects, and catalytic effects on reactivity.
	a4	Understand conrotatory and disrotatory electrocyclic ring-opening and ringclosure, the effect of pathway on stereochemical outcome, and the orbital symmetry explanation of which pathway is allowed under thermal and photochemical conditions.
	a5	Sigmatropic rearrangements: Cope and Claisen and related processes and supra and antarafacial migration of hydrogen and carbon-based groups. Group transfer reactions – The ene reaction.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify and explain the types of pericyclic reactions.
	b2	Discuss how pericyclic reactions be analysed.
	b3	explain the observed reactivity and stereochemistry for the different types of pericyclic reactions
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Write accurate and detailed pericyclic reaction mechanisms
	c2	Predict regiochemistry and stereochemistry in pericyclic reactions.
	c3	Devise multi-step synthetic strategies to specific molecules within defined limitations
	c4	Perform safe lab operations, analyze and communicate the resulting experimental data to make conclusions regarding principles of pericyclic reactions and mechanisms.
	c5	Communicate thoughts, ideas, concepts, observations and conclusions verbally and in writing
d-General and transferable skills: At the end of the course the student should be able to:		
4-Contents	1	Pericyclic reactions .Overview Cycloadditions • Ozonolysis 1,3-dipolar • Nitron 1,3-dipolar • Isoxazole 1,3-dipolar



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		• [4+3]-Allyl cycloaddition • [6+4]-Thermal cycloaddition • Triazole formation • Tetrazole formation • Intramolecular carbonyl ene • Dihydroxylation using OsO4 • Periodate diol cleavage	
	2	Sigmatropic rearrangements • [3,3]-Claisen rearrangement aromatic • [3,3]-Claisen rearrangement acyclic • [3,3]-Ireland-Claisen • [2.3]-shift sulfoxide • [1,5]-H shift cyclopentadiene • [1,7]-H sigmatropic shift • [3,3]-Fischer Indole • Citral Tandem Claisen-Cope	
	3	Electrocyclic reactions • Stereospecificity • Conrotatory - cyclobutene • Disrotatory - hexatriene • Endiandric acids synthesis	
	4	Cheleotropic reactions • Stereospecific diene-SO2.	
	5	Group transfer reactions The ene reaction..	

5- Teaching and learning method	1	Lecture	☐
	2	Open Discussion	☐
	3	Scientific Visits	☐

6- Teaching and learning methods for students with limited capacity		Not Availiable.

7-Student Assessment Methods			

a-Using Assessment	1	Final Examination	
	2	Mid-Term Examination	
	3	semester work	

b-Assessment Schedule	1	Final Examination	15
	2	Mid-Term Examination	8
	3	semester work	on all weeks



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c-Weighting of Assessments	1	Final Examination	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	semester work	2.5	5.00%
8-List of References				
a-Course notes	1	Notes and slides prepared by the lecturer		
b-Essential Books(text books)	1	G. B. Gill, M. R. Willis, Pericyclic Reactions, First published in 1974 by Chapman and Hall Ltd.		
c-Suggested Books	1	An Introduction to Orbital Symmetry and Pericyclic Reactions 2006 - Prof. Dr. Fathy Mohamed Abdelrazek		
d-Scientific periodicals or Publications	1	Papers distributed or assigned as convenient		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Pericycliv reactions .Overview Cycloadditions • Ozonolysis 1,3-dipolar • Nitroene 1,3-dipolar • Isoxazole 1,3-dipolar • [4+3]-Allyl cycloaddition • [6+4]-Thermal cycloaddition • Triazole formation • Tetrazole formation • Intramolecular carbonyl ene • Dihydroxylation using OsO ₄ • Periodate diol cleavage	1,2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	



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2	Sigmatropic rearrangements • [3,3]-Claisen rearrangement aromatic • [3,3]-Claisen rearrangement acyclic • [3,3]-Ireland-Claisen • [2,3]-shift sulfoxide • [1,5]-H shift cyclopentadiene • [1,7]-H sigmatropic shift • [3,3]-Fischer Indole • Citral Tandem Claisen-Cope	2,3	a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c5 ,	
3	Electrocyclic reactions • Stereospecificity • Conrotatory - cyclobutene • Disrotatory - hexatriene • Endiandric acids synthesis	4-6	a2 , a3 ,	b1 , b2 , b3 ,	c1 , c5 ,	
4	Cheletropic reactions • Stereospecific diene-SO₂.	7,8	a2 , a3 ,	b1 , b2 , b3 ,		
5	Group transfer reactions The ene reaction..	9-13	a2 , a4 , a5 ,	b1 , b2 , b3 ,	c1 , c2 , c4 ,	

Course Coordinator Prof. Dr. Ibrahim Essam El-Shamy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Inorganic reaction mechanism**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C335	Title	Inorganic reaction mechanism	Level	3	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	Instill in students a sense of enthusiasm for chemistry, an appreciation of its application in different contexts and to involve them in an intellectually stimulating and satisfying experience of learning and studying.
2	Encourage originality of thought.
3	Provide students with a broad and balanced foundation of chemical knowledge and skills.
4	Develop in students the ability to apply their chemical knowledge and skills to the solution of theoretical and practical problems in chemistry.
5	Develop in students, through an education in chemistry, a range of transferable skills, of value in chemical and non-chemical employment
6	Provide students with comprehensive education and essential knowledge in the study of substitution reactions of square planar, tetrahedral and octahedral complexes
7	Furnish some light on the applications of coordination compounds in various fields.
8	Classify the inorganic reaction mechanisms according to the energy barrier diagram.
9	Suggest synthetic routes for some selected square planar and octahedral complexes.



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3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate the fundamental terminology used in substitution reactions of complexes
	a2	Explain the reaction mechanism for substitution reactions in four and six coordinating complexes.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Collect a wide range of chemical salts concerning the substitution reactions of complexes.
	b2	Suggest mechanisms for chemical processes and propose the rate of such reactions
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use scientific literature effectively
	c2	Conduct risk assessments concerning the use of nuclear chemical substances
d-General and transferable skills: At the end of the course the student should be able to:	d1	Employ recent communications measuring the rate of substitution reactions of complexes.
	d2	Express (oral and writing) their understanding problems.
	d3	Identify the essential parts of a problem and formulate a strategy for solving the problem and abilities to estimate the solution to a problem, apply appropriate techniques to arrive the solution, test the correctness of their solution, interpret their results and connect it to related areas of chemistry
	d4	Use information and communications technology
	d5	Work independently and as a part of a team, and learn independently with open - mindedness and critical inquiry
	d6	Plan and implement efficient and effective modes of working.
4-Contents	1	Introduction to basic concepts of inorganic reactions
	2	Different mechanistic ways of inorganic reactions
	3	Substitution reactions of square planar complexes.
	4	Substitution reactions of octahedral complexes
	5	Ligand-ligand attack
	6	General kinetic methods for following the rate of substitution



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	7	General revision		
5- Teaching and learning method	1	lecture	☐	
	2	Discussion	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination	14	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-term Examination	45	90.00%
	3	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Course Notes		
b-Essential Books(text books)	1	Introduction to coordination, solid state and descriptive inorganic chemistry, Geln E.Roders, McGraw-hill, Inc. (1994)		
c-Suggested Books	1	Medical Inorganic chemistry, Sessler (2007).		
	2	Chemical Kinetics and Inorganic Reaction Mechanisms, Smiljko Asperger, 2nd Edition, Springer Science and Business Media New York, 2003		
d-Scientific periodicals or Publications	1	www.chemweb.com		
	2	http://www.alchemyst.co.uk/alchemystry/pdf/Inorganic/inorganic_mechanisms.pdf		



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3	www.eul.edu.eg
4	http://www.chem.latech.edu/~upali/chem481/chem481c14.pdf

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to basic concepts of inorganic reactions	1	a1 ,		c1 ,	d1 , d4 ,
2	Different mechanistic ways of inorganic reactions	2-4	a1 , a2 ,	b1 ,	c1 ,	d1 , d2 , d4 ,
3	Substitution reactions of square planar complexes.	5, 6	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d3 , d4 , d6 ,
4	Substitution reactions of octahedral complexes	7-9	a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d4 , d5 , d6 ,
5	Ligand-ligand attack	10	a1 ,		c1 , c2 ,	d1 , d3 , d4 , d5 , d6 ,
6	General kinetic methods for following the rate of substitution	11-13	a1 , a2	b2 ,	c1 , c2 ,	d2 , d4 , d5 , d6 ,
7	General revision	14	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , d5 , d6 ,

Course Coordinator Prof. Dr. **Samir Mostafa El-Medani**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Advanced Chemistry Synthesis**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C3216	Title	Advanced Chemistry Synthesis			Level	3	Semester	2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	To study the basic concepts of chemistry synthesis.
2	To study the general approaches for C-C bond
3	To study the principle of retrosynthesis for synthesis of complex molecules.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Understand the different methodologies of organic synthesis
	a2	Understand the different methods of C-C bond formations and functional group interconversion.
	a3	Understand the different strategy of retrosynthesis
	a4	Understand how to synthesis compled molecules .
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify the suitable method of C-C bond formation.
	b2	Select the suitable function group interconversion for synthesis.
	b3	Determine the latent and utilize it in the suitable retro synthesis.
	b4	Apply the above methodologies fot the total synthesis of complexcompounds



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Able to self learning.	
	c2	Synthesis different types of organic compound	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work in a team	
	d2	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)	
4-Contents	1	Introduction	
	2	Aldolcondensation	
	3	Grignard reaction	
	4	Michael and cyclo additions	
	5	Strategy of retrosynthesis and synthon equivalent	
	6	Total synthesis of complex compounds	
	7	Problems	
5- Teaching and learning method	1	lecture	☐
	2	Discussion sessions	☐
	3	Homework	☐



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6- Teaching and learning methods for students with limited capacity		Not Avaliable.
7-Student Assessment Methods		
a-Using Assessment		
b-Assessment Schedule		
c-Weighting of Assessments		
8-List of References		
a-Course notes		
b-Essential Books(text books)		
c-Suggested Books		
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction	1	a1	b1	c1	d1 d2
2	Aldolcondensation	2	a1	b1	c2	d2
3	Grignard reaction	3	a2	b3	c2	d2
4	Michael and cyclo additions	4-5	a3	b2	c2	d2
5	Strategy of retrosynthesis and synthon equivalent	6-9	a3	b2	c2	d2



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6	Total synthesis of complex compounds	10-12	a4	b4	c2	d2
7	Problems	13-14	a4	b4	c1	d1

Course Coordinator Prof. Dr. **Ramadan Moawad Abdel-Motaleb**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Physical Polymer(1)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C329	Title	Physical Polymer(1)			Level	3	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Provide students with the opportunities to develop an interdisciplinary the polymer concepts.
2	Enable students to acquire the intellectual skills necessary to handle subject-specific theory, information and issues
3	Support the, students development of a wide-range of subject-specific and generic practical and transferable skills
4	Provide the student with the polymer characterization and developing.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate the principles of a systems approach to polymer science.
	a2	Describe the importance of variation in polymer industry
	a3	State the main characteristic features between polymer (homo, copolymer and blend).
	a4	List different types of polymer



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Formulate evidence from a range of sources to support findings and hypotheses	
	b2	Analyze and evaluate information	
	b3	Conclude subject-specific theories, concepts and principles	
	b4	Plan a critical approach to academic literature and other sources of information	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Perform arrange of quantitative, qualitative and computational analyses and interpret the results.	
	c2	Design an independent project.	
	c3	Collect a range of methods to solve practical problems	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Download data from a range of sources	
	d2	demonstrate flexibility when solving numerical and other complex appropriate techniques	
	d3	use information technology applications	
4-Contents	1	Principles to polymer science	
	2	Stereochemistry of polymers	
	3	Mechanisms of polymer formation	
	4	Techniques of polymer prepared	
	5	Copolymerization	
	6	Characterization of polymer	
5- Teaching and learning method	1	Lecture	☐
	2	Discussion	☐
	3	Homework	☐
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment	1	Final written exam	
	2	Mid-Term Examination	
	3	Oral Examination	



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b-Assessment Schedule	1	Final written exam	15	
	2	Mid-Term Examination	8	
	3	Oral Examination	10	
c-Weighting of Assessments	1	Final written exam	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the student's part by part.		
b-Essential Books(text books)	1	Kubaschewski, O. and Hopkins B. E., Oxidation of Metals and Alloys, Butterworths, London, 1962.		
	2	Kubaschewski, O. and Hopkins B. E., Oxidation of Metals and Alloys, Butterworths, London, 1962.		
c-Suggested Books	1	Fontana, M. G. and Green, N. D., Corrosion Engineering, McGraw-Hill, New York, 1967.		
	2	Kubaschewski, O. and Hopkins, B. E., Oxidation of Metals and Alloys, Butterworths, London, 1962.		
d-Scientific periodicals or Publications	1	Corrosion science journal, advanced polymeric materials journal		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Principles to polymer science	1	a1 ,	b1 , b4 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
2	Stereochemistry of polymers	2,3	a1 , a2 ,	b1 ,	c2 , c3 ,	d1 , d2 , d3 ,
3	Mechanisms of polymer formation	4-6	a2 , a3 ,	b1 , b2 , b3 ,	c2 , c3 ,	d1 , d3 ,
4	Techniques of polymer prepared	7-9	a2 , a3 ,	b1 ,	c2 , c3 ,	d2 , d3 ,



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5	Copolymerization	10,11	a2 , a3 ,	b2 , b3 ,	c2 , c3 ,	d1 , d2 ,
6	Characterization of polymer	12-14	a4 ,	b2 , b3,	c2 , c3 ,	d2 , d3 ,

Course Coordinator Prof. Dr. **Ghada Mohamed**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For

Principles of Quantum Chemistry (Elective)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C347	Title	Principles of Quantum Chemistry (Elective)	Level	3	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	The overall aims of the study of this course is: To introduce the students to mathematical concepts, operators, matrix element, eigenvalues and functions, Photoelectric effect and Compton effect, Bohr theory and De Broglie principle, postulates of quantum theory, Schrödinger wave equation to particle in a box.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define the mathematical preliminaries related to quantum mechanics.
	a2	Illustrate the operators, matrix element, eigenvalues and functions.
	a3	Grasps the postulates of quantum theory.
b- Intellectual skills: At the end of the course the student should be able to:	b1	apply Schrödinger wave equation to particle in a box, rotation of rigid body and harmonic oscillator. the hydrogen atom, chemical bonding, and computations
	b2	Link quantum mechanical principles to the hydrogen atom.
	b3	Interpret quantum mechanical principles to chemical bonding.



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	b4	Plan molecular symmetry and point groups.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Perform computational problems and simulations.
d-General and transferable skills: At the end of the course the student should be able to:	d1	use access data and information from libraries and internet related to course subjects.
4-Contents	1	Mathematical preliminaries.
	2	Failure of classical physics, need for quantum theory.
	3	Atomic spectra and Black body radiation, Photoelectric effect and Compton effect, Bohr theory and De Broglie principle.
	4	Postulates of quantum chemistry.
	5	Schrodinger equation for a particle in one and three dimensional box.
	6	Wave functions for the H-atom.
	7	Revision
5- Teaching and learning method	1	lecture ☐
	2	Discussion ☐
	3	Homework ☐
6- Teaching and learning methods for students with limited capacity		Not Available.
7-Student Assessment Methods		
a-Using Assessment	1	Final-term Examination
	2	Mid-Term Examination
	3	Oral Examination.
b-Assessment Schedule	1	Final-term Examination 15
	2	Mid-Term Examination 8
	3	Oral Examination. 12



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c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination.	2.5	5.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part		
b-Essential Books(text books)	1	Golen W. Ewing		
c-Suggested Books	1	Physical Methods in chemistry by Drago		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Mathematical preliminaries.	1,2	a1 , a2 ,	b1 ,	c1 ,	d1 ,
2	Failure of classical physics, need for quantum theory.	3	a2 , a3 ,	b1 , b2 ,	c1 ,	d1 ,
3	Atomic spectra and Black body radiation, Photoelectric effect and Compton effect, Bohr theory and De Broglie principle.	4-6	a2 ,	b3 ,	c1 ,	d1 ,
4	Postulates of quantum chemistry.	7	a1 , a3 ,	b1 , b2 ,	c1 ,	d1 ,
5	Schrodinger equation for a particle in one and three dimensional box.	8-10	a1 , a2 ,	b2 , b3 ,	c1 ,	d1 ,



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6	Wave functions for the H-atom.	11-13	a1 , a2 , a3 ,	b2 , b3 , b4 ,	c1 ,	d1 ,
7	Revision	14				

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For

Organic Photochemistry (1) (Elective)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C3217	Title	Organic Photochemistry (1) (Elective)		Level	3	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	Understand the main concepts of photochemistry.
2	Differentiate between the excited states and the ground state.
3	Interpret mechanism of photochemical reactions.
4	Predict the product of a photochemical reaction.
5	Know the applications of photochemistry.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:

a1	Know the properties and fate of excited states.
a2	Understand different types of photochemical reactions
a3	Understand how the photochemical reactions occur.
a4	Know the phenomena of bio- and chemoluminescence.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Differentiate between the singlet and triplet excited states.	
	b2	Illucidate the formation of products from photoreactions	
	b3	Calculate quantum yields for different photoreactions.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Deduce the product of a photochemical reaction.	
	c2	Predict the type of excited states involved in the reaction.	
	c3	photochemical reactions produce products not available by ordinary reactions	
d-General and transferable skills: At the end of the course the student should be able to:			
4-Contents	1	Introduction to organic photochemistry	
	2	Types and properties of excited states	
	3	Fate of excited states	
	4	Photolysis	
	5	Production of free radicals	
	6	Photochemical rearrangement	
	7	Photochemical reduction	
	8	Photochemical oxidation	
	9	Rearrangement and isomerization	
	10	Photoluminescence and Chemiluminescence	
5- Teaching and learning method	1	lecture	☐
	2	the board	☐
	3	the handouts	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final- Written exam	to assess the follow up and the understanding of students and the skills of students .	
	2	Midterm exam		
	3	Oral exam		
	4	Practical Exam.		
b-Assessment Schedule	1	Final- Written exam	15	
	2	Midterm exam	8	
	3	Oral exam	9	
	4	Practical Exam.	14	
c-Weighting of Assessments	1	Final- Written exam	35	70.00%
	2	Midterm exam	2.5	5.00%
	3	Oral exam	2.5	5.00%
	4	Practical Exam.	10	20.00%
8-List of References				
a-Course notes	1	Notes by the lecturer of the course		
b-Essential Books(text books)	1	Advanced Org. Chemistry Part 1[Francis A.Cary&Richard J.Sunberg]		
	2	Advanced Org. Chemistry [March]		
c-Suggested Books				
d-Scientific periodicals or Publications	1	library.		
	2	Internet.		

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to organic photochemistry	1,2	a1 ,	b1 ,	c1 ,	
2	Types and properties of excited states	3	a1 , a2 ,	b1 ,	c1 , c2 ,	
3	Fate of excited states	4	a1 ,	b1 ,	c1 , c2 ,	
4	Photolysis	5,6	a2 ,	b2 , b3 ,	c1 , c2 , c3 ,	
5	Production of free radicals	7	a2 , a3 ,	b2 , b3 ,	c1 , c3 ,	
6	Photochemical rearrangement	8	a2 , a3 ,	b2 , b3 ,	c1 , c2 ,	
7	Photochemical reduction	9,10	a3 ,	b2 , b3 ,	c1 , c2 , c3 ,	
8	Photochemical oxidation	11	a3 ,	b2 , b3 ,	c1 , c2 , c3 ,	
9	Rearrangement and isomerization	12	a3 ,	b2 , b3 ,	c1 , c3 ,	
10	Photoluminescence and Chemiluminescence	13	a3 ,	b2 , b3 ,	c1 , c2 , c3 ,	

Course Coordinator Prof. Dr. **Abdelmoneim A. Makhoulf**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Molecular Immunology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z462	Title	Molecular Immunology			Level	4	Semester	2
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Offers a comprehensive view of modern immunology at the molecular and cellular level. firstly the fundamentals of immunology, the innate immunity, discussion of the structure and function of important molecules in the immune system, such as antibodies, major histocompatibility antigens, complement and the T-cell receptor. Discussion of the development and function of the cellular immune response. Also, the course focuses on applied immunology and discusses use of antibodies in medicine and biotechnology, hypersensitivity, autoimmunity, immunodeficiency, tumor immunology, infectious disease, and transplantation immunology.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	demonstrate fundamental concepts, principals, terminology associated with Molecular Immunology.
	a2	explain the cellular functions at molecular level
	a3	Identify the relationship between the structure and function.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	compare between structure & function of different immunological cells	
	b2	Describe the structure of Antibodies.	
	b3	Find correlation between immune cells & parasites.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Practice applied immunology .	
	c2	Experience the handling of different techniques of immunology.	
	c3	Analyze ultrastructure of different Antibodies	
d-General and transferable skills: At the end of the course the student should be able to:	d1	find information independently	
	d2	work coherently and successfully as a part of a team in projects	
	d3	Apply the basic principals in the field.	
	d4	Build up the presentation skills.	
4-Contents	1	Introduction & Overview of course Review of Innate immunity & Innate cellular response	
	2	cytokines & Innate response to virus, NK cells, TLR3, interferons Overview of acquired immunity - role of B and T cells & B-cell development overview	
	3	Chemical and Biological properties of Antibodies & Genetic changes during antibody production Regulation and Expression of BCR	
	4	MHC Genetics- MHC Structure and antigen presentation	
	5	Receptor interactions & Antigen interactions Antibody engineering	
	6	Development of T-cells Activation of T-cells	
	7	Vaccines, Cancer Immunology & Understanding Clinical Flow Cytometry	
5- Teaching and learning method	1	lecture (using power point presentation & black board)	☐
	2	Seminars & presentation	☐
	3	Practical	☐
	4	Homework & online search	☐



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6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written		
	2	Semester work		
	3	Mid- term exam		
	4	Oral exam		
b-Assessment Schedule	1	Final written	15	
	2	Semester work	13	
	3	Mid- term exam	8	
	4	Oral exam	13	
c-Weighting of Assessments	1	Final written	35	70.00%
	2	Semester work	2.5	5.00%
	3	Mid- term exam	2.5	5.00%
	4	Oral exam	2.5	5.00%
8-List of References				
a-Course notes	1	Introduction to Molecular Immunology lecture notes		
b-Essential Books(text books)	1	Cellular and Molecular Immunology, 8E (2015)		
c-Suggested Books	1	Roitt’s Essential Immunology, 12e. & Owen Kuby Immunology 7th c2013		
d-Scientific periodicals or Publications	1	http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2567		
	2	http://www.jimmunol.org/		
	3	http://www.nature.com/subjects/immunology		
	4	https://www.immunology.org/		

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction & Overview of course Review of Innate immunity & Innate cellular response	1,2	a1 ,	b1 ,	c2 ,	d1 ,
2	cytokines & Innate response to virus, NK cells, TLR3, interferons Overview of acquired immunity - role of B and T cells & B-cell development overview	3,4	a2 ,	b2 ,	c1 ,	d3 ,
3	Chemical and Biological properties of Antibodies & Genetic changes during antibody production Regulation and Expression of BCR	5,6	a1 ,	b3 ,	c3 ,	d2 ,
4	MHC Genetics- MHC Structure and antigen presentation	7,8		b3 ,	c2 ,	d1 ,
5	Receptor interactions & Antigen interactions Antibody engineering	9,10	a2 ,	b1 ,	c1 ,	d2 ,
6	Development of T-cells Activation of T-cells	11,12	a1 ,	b3 ,	c2 ,	d4 ,
7	Vaccines, Cancer Immunology & Understanding Clinical Flow Cytometry	13,14	a3 ,	b2 ,	c3 ,	d4 ,

Course Coordinator Prof. Dr. **Ayman Mustafa Abdel-Aziz**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Muscle & Nerve Physiology (Elective)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z417	Title	Muscle & Nerve Physiology (Elective)	Level	4	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	The overall aim of the study of this course is: to provide a functional understanding of cellular structure and function of the muscular, nervous, special senses and heart.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Describe normal functional organization & structure of the autonomic nervous system, nerve and muscle.
	a2	Identify nerve action potential, action potential transmission.
	a3	Recognize changes accompanying the propagation of nerve impulses.
	a4	Identify factors influencing simple muscle twitch.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Interpret reflex action of nerve.
	b2	Discriminate between the structural and functional properties of skeletal, cardiac and smooth muscles
	b3	The effect of different stimuli on muscle and nerve.



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	A nerve and muscle preparation.	
	c2	Asses the effect of different stimuli on nerve and muscle	
	c3	Demonstration of a single muscle twitch(smt)	
	c4	Effect of increasing strength of stimuli on smt.	
	c5	Study of the effect of various drugs on the frog's heart.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Communicate effectively.	
	d2	Work in a research team.	
	d3	Use the Internet to find information.	
4-Contents	1	Properties of nerve tissues. Organization structure & function of CNS (brain & spinal cord) PNS (cranial & spinal nerves).	
	2	Basic neurophysiology describing membrane potentials. Mechanism of nerve impulses conduction.	
	3	Action of neurotransmitters on receptors.	
	4	Sensory and motor function.	
	5	Reflex Arc and reflex action. Selected examples of reflex activity.	
	6	Comparison of muscle features & skeletal muscle ultra-structure.	
	7	Theories of muscle contraction. Changes accompanying muscle contraction.	
	8	Properties of the cardiac muscle and heart sounds.	
	9	Practical part	
	10	Effect of different stimuli on nerve and muscle.(Muscle Simulations.)	
	11	Demonstration of a single muscle twitch(smt)	
	12	Effect of increasing strength of stimuli on smt.	
	13	Study of the effect of various drugs on the frog's heart.	
5- Teaching and learning method	1	lecture (Data show projectors)	☐
	2	Students' contributions to discussions on lecture materials.	☐



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	3	Tutorial exercises compose of a mixture of multiple choice-type and short questions, practical tasks.		☐
	4	Encourage students to use online and library resources.		☐
6- Teaching and learning methods for students with limited capacity				Not Availiable.
7-Student Assessment Methods				
a-Using Assessment	1	Final written examination	comprising various formats of questions aiming to access the accuracy of information provided by student with respect to the content covered in lectures and practical classes.	
	2	Practical examination	Laboratory exercises include virtual and interpretation of the lecture materials.	
	3	Oral Examination	Sheet (oral or written)	
	4	Mid-Term Examination		
b-Assessment Schedule	1	Final written examination	15	
	2	Practical examination	14	
	3	Oral Examination	10	
	4	Mid-Term Examination	8	
c-Weighting of Assessments	1	Final written examination	35	70.00%
	2	Practical examination	10	20.00%
	3	Oral Examination	2.5	5.00%
	4	Mid-Term Examination	2.5	5.00%



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8-List of References		
a-Course notes	1	Power point slides
b-Essential Books(text books)	1	Essentials of Anatomy and Physiology / Edition 4 by Frederic H. Martini, Edwin F. Bartholomew
c-Suggested Books	1	Physiology (Gillian Pocock & Christopher D.Richards)
d-Scientific periodicals or Publications	1	http://wps.pearsoned.it/fisiologia_uman_a5/165/42312/10831893.cw/index.html
	2	http://wps.aw.com/bc_physioex_8_ap_1ms/112/28698/7346750.cw/index.html
	3	http://www.mhhe.com/biosci/genbio/virtual_labs_2K8/pages/MuscleSimulations.html

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Properties of nerve tissues. Organization structure & function of CNS (brain & spinal cord) PNS (cranial & spinal nerves).	1-2	a1 ,			d1 , d2 , d3,
2	Basic neurophysiology describing membrane potentials. Mechanism of nerve impulses conduction.	3,4	a2 ,			d1 , d3 , d2 ,
3	Action of neurotransmitters on receptors.	5	a2 ,			d1 , d3 , d2 ,
4	Sensory and motor function.	6-8	a1 ,			d1 , d3 , d2 ,
5	Reflex Arc and reflex action. Selected examples of reflex activity.	9	a4 ,	b1 ,		d1 , d3 , d2 ,



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6	Comparison of muscle features & skeletal muscle ultra-structure.	10,11		b2 ,		d1 , d3 , d2 ,
7	Theories of muscle contraction. Changes accompanying muscle contraction.	12,13		b3 ,		d1 , d3 , d2 ,
8	Properties of the cardiac muscle and heart sounds.	14		b3 ,		d1 , d3 , d2 ,
9	Practical part					
10	Effect of different stimuli on nerve and muscle.(Muscle Simulations.)	1-4			c1 , c2 , c3 ,	d1 , d3 , d2 ,
11	Demonstration of a single muscle twitch(smt)	5-7			c1 , c2 , c3 ,	d1 , d3 , d2 ,
12	Effect of increasing strength of stimuli on smt.	8-11			c4 ,	d1 , d3 , d2 ,
13	Study of the effect of various drugs on the frog's heart.	12-13			c5 ,	d1 , d3 , d2 ,

Course Coordinator Prof. Dr. Naglaa El-Sayed Rifaat Ismael

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Biostatistics biologists**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z412	Title	Biostatistics biologists			Level	4	Semester	1 and 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge, apply and analysis the basic concepts of Probability and Statistics and their applications in the biological area.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate data collection.
	a2	Define Measures of central tendency.
	a3	Define Measures of Dispersion
	a4	Explain the regression and correlation.
	a5	Explain random experiments, events and their probabilities.
	a6	Define Discrete and continuous random variables.
	a7	Illustrate Discrete and continuous distributions.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze and solve the problem by using Statistics, and Distinguish between the different type of data.
	b2	Apply the probability theory and collect evidence in order to interpret phenomena and risk assessment



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Solve problems to the course material by using statistics and probability laws.	
	c2	Record data and information from libraries related to Statistics.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Write a report with the standard scientific guidelines	
	d2	Work coherently and successfully as a part of a team in project.	
	d3	Use appropriate computer program, packages and download on line data.	
	d4	Gain a communication skills (present reports in seminars, workshops or group meeting).	
	d5	Study and find information independently.	
	d6	Manager its time	
4-Contents	1	Organization and description of data	
	2	Measures of central tendency and dispersion	
	3	The regression and correlation	
	4	Random experiments, events and conditional probabilities	
	5	Discrete and continuous random variables, with Discrete and continuous distributions	
	6	Sampling distribution	
	7	Normal distribution, T, F and Qai sqaure - distributions	
	8	Hypothesis tests and applications	
5- Teaching and learning method	1	lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Semester work	☐



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination	to assess the ability of understanding the subject, proof of theorems and application, the ability of solving problems related to the course.	
	2	Mid- term exam.	To assess the ability of understanding and application.	
	3	Oral Examination	To assess General and transferable skills.	
	4	Semester work	to assess the ability of understanding and Intellectual skills.	
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid- term exam.	8	
	3	Oral Examination	14	
	4	Semester work	on all weeks	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid- term exam.	10	20.00%
	3	Oral Examination	2.5	5.00%
	4	Semester work	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Perm S. Mann: Introductory statistics, John Wiley and Sons , Inc., 2001		
	2	Introduction To Statistics and Data Analysis By Roxy Peck, Chris Olsen, Jay L. Devore, 2011		



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c-Suggested Books			
d-Scientific periodicals or Publications	<table border="1"> <tr> <td>1</td><td>Math world:http://mathworld.wolfram.com</td></tr> </table>	1	Math world: http://mathworld.wolfram.com
1	Math world: http://mathworld.wolfram.com		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Organization and description of data	1	a1 ,	b1 ,	c2 ,	d1 , d2 ,
2	Measures of central tendency and dispersion	2,3	a2 ,	b1 ,	c2 ,	d2 , d3 ,
3	The regression and correlation	4,5	a3 ,	b1 , b2 ,	c1 , c2 ,	d4 , d5 ,
4	Random experiments, events and conditional probabilities	6	a4 ,	b1 ,	c2 ,	d5 , d6 ,
5	Discrete and continuous random variables, with Discrete and continuous distributions	7,8	a5 ,	b1 ,	c2 ,	d6 ,
6	Sampling distribution	9,10	a6 ,	b1 ,	c2 ,	d6 ,
7	Normal distribution, T, F and Qai sqaure - distributions	11,12	a7 ,	b1 ,	c2 ,	d6 ,
8	Hypothesis tests and applications	13,14	a7 ,	b1 ,	c2 ,	d6 ,

Course Coordinator Prof. Dr. **Mathematics department**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Biological control

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z452	Title	Biological control			Level	3	Semester	1
Lecture (h/w)	1	Practical (h/w)	2	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	1- The student preserves the environment and the natural balance
2	- Recognize the importance of biological control and its components
3	The student determines how to choose the biological control elements for each pest separately
4	-The student familiar with how the application of biological control of pests.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Knows the basics of biological control
	a2	Familiar with the basic differences between the parasites and predators
	a3	understand the life cycles of parasites and insect predators
	a4	known work in the field of biological control and Requirements
	a5	analyze the obtained data
	a6	present the results to the class in both oral and written form



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Distinguishes elements of biological control
	b2	understand the obstacles facing the application of biological control program
	b3	It defines the priorities of the application of biological control program
	b4	- describe the catalytic functions of enzymes, and perform enzyme kinetics calculations.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	pick a relevant, doable research question and frame it as a testable hypothesis
	c2	choose an appropriate study design
	c3	write the informed consent document
	c4	oversee data collection
	c5	analyze and interpret the data (provide basic statistical consulting)
	c6	. craft a clear, concise presentation of the study to the rest of the class
d-General and transferable skills: At the end of the course the student should be able to:	d1	read and understand scientific literature pertaining to subject matter in biochemistry.
	d2	- discuss an assay using different tools, like data show and videos
4-Contents	1	History of biological control
	2	Terminology used in biological control.
	3	Differences between predation and parasitism
	4	Biological relationships between natural enemies and its hosts
	5	Development in the internal and external parasites
	6	models of life cycles for internal and external parasites
	7	Respiration in parasites and predators
	8	Host selection and host specialization
	9	Behavior of egg parasites
	10	Application of Biological control in greenhouses
	11	natural enemies import



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	12	final revision	
5- Teaching and learning method	1	lecture	☐
	2	Discussion.	☐
	3	Practical.	☐
	4	Homework	☐
6- Teaching and learning methods for students with limited capacity		Not Available.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes			
b-Essential Books(text books)	1	Chapman, R.F. The Insects, Structure and Function 4 th ed., Cambridge University Press. 1998 Blum, M.S. (1985) Fundamentals of Insect Physiology. Kerkut, G.A. and Gilbert, L.I. (1985)	
	2	) Comprehensive Insect Physiology, Biochemistry and Pharmacology. Pergamon Press, NY. (replaced by the one below) L.I. Gilbert and K. Iatrou and S.S. Gill. 2005. 7 volume set.	
	3	Wigglesworth, V.B. (1984) , eighth edition. Chapman and Hall, London (a scaledown version of the larger,).	
	4	Comprehensive molecular insect science. In library under ELECTRONIC DATABASES, not electronic books (updated version of the above).	
c-Suggested Books	1	Principles of Biochemistry. Lehninger, 6th Ed. (2013) (W. H. Freeman)	



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	2	Nation, James.L. (2008) Insect Physiology and Biochemistry. CRC Press, Taylor and Francis group. NY.
	3	2nd Edition. ISBN: 978-1-4200-6177-2. Gilbert, L.I (late 2011 or early 2012) and . Elsevier (In press). These two books update the most recent advances in insect molecular biology, biochemistry and endocrinology.
d-Scientific periodicals or Publications	1	Web Site: www.pitt.edu/~jbrodsky/biosc1820/ Encyclopedia of entomology.2004. Ed. By John L. Capinera, Kluwer. 3 volumes. Journal of Insect Physiology
	2	Insect Biochemistry and Molecular Biology
	3	Archives of Insect Biochemistry and Physiology
	4	Insect Molecular Biology
	5	Journal of Insect Science (online journal)

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	History of biological control	1	a1	b1-b3- b4	c1	d1
2	Terminology used in biological control.	2	a1, a2, a6,	b1-b3-b4	c1-c2-c4-c6	d1-d2
3	Differences between predation and parasitism	3	a1, a5, a6	b1, b3, b4	c1	d1
4	Biological relationships between natural enemies and its hosts	4	a, a2, a3	b1, b2, b3, b4	c1	d1
5	Development in the internal and external parasites	5	a1, a2, a6	b2, b3, b4	c1, c2, c5	d1
6	models of life cycles for internal and external parasites	6	a1, a5, a6	b1, b2, b3, b4	c1, c3, c4, c6	d1
7	Respiration in parasites and paredators	7	a1, a5, a6	b1, b2, b4	c1, c3, c5, c6	d1



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8	Host selection and host specialization	8	a1, a2, a6	b1, b3, b4	c1, c2, c5	d1
9	Behavior of egg parasites	9	a1, a2, a3, a6	b1, b3, b4	c1, c3, c6	d1, d2
10	Application of Biological control in greenhouses	10	a1, a2, a3, a6	b1, b3, b4	c1, c2, c4, c6	d1-d2
11	natural enemies import	11-12	a1, a2, a3	b1, b3, b4	c1, c3, c6	d1, d2
12	final revision	12-14	a1, a4, a6	b1, b2, b3, b4	c1, c4, c6	d1, d2

Course Coordinator Prof. Dr. **Adel Abed El- Hakim Abo El-Olla**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Entomology and Environmental**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z453	Title	Entomology and Environmental			Level	4	Semester	1-2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	- How can the environment get rid of biological waste products, like feces, dead human and animal carcasses?
2	How can the environment retain its natural balance?
3	How can insects guide us to forecast water quality, before running chemical analyses?
4	the actual meaning of the natural balance and food web

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	understand the meaning of the natural balance of the environment.
	a2	evaluate the healthy degree of a definite environment.
	a3	evaluate the healthy degree of a definite environment.
	a4	Describe the physical and chemical characteristics of different habitats which limit the number and kinds of insects present



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze the samples of water	
	b2	- predict the water quality from collected insect samples	
	b3	reduce the impact of the environmental pollution	
	b4	plan to solve the problems due to hazardous effects of the pollution	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	measure the ph of the water	
	c2	determine the water quality	
	c3	collect insect specimens from different habitats using suitable tools (aquatic nets, pitfall traps or aerial nets)	
d-General and transferable skills: At the end of the course the student should be able to:	d1	suggest applicable solutions for different problems facing the safety of different environments	
	d2	give nontraditional solutions that are non expensive and more safe to human and animal health	
4-Contents	1	Introduction	
	2	Decomposers: Phytoscavegers	
	3	Omnivorous	
	4	Zoo-scavegers and forensic entomology	
	5	Succession and steps of decomposition	
	6	Dung feeders	
	7	Water pollution.	
	8	Insect as bio-indicators of water pollution	
5- Teaching and learning method	1	Lecturer	☐
	2	Discussion.	☐
	3	Practical.	☐
	4	Homework	☐



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6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term		
	2	Final-term		
	3	Oral		
	4	Practical Examination		
b-Assessment Schedule	1	Mid-Term	8	
	2	Final-term	15	
	3	Oral	10	
	4	Practical Examination	12	
c-Weighting of Assessments	1	Mid-Term	2.5	5.00%
	2	Final-term	35	70.00%
	3	Oral	2.5	5.00%
	4	Practical Examination	15	30.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Roach, John (2003). "Dung Beetles Navigate by the Moon, Study Says", National Geographic News. Retrieved on 2007-08-02		
	2	An Introduction to the Aquatic Insects of North America Merritt, Cummins, and Berg, eds. (4th ed) (Available in CSU Bookstore, Amazon.com).		
	3	3- Kruuk, H. Hunter and Hunted: Relationships between Carnivores and People. Cambridge, UK: Cambridge University Press, 2002. Print.		
	4	Forest Entomology: Ecology and Management. By Robert N. Coulson, John A. Witter. Willy and Son copyright		



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c-Suggested Books	
d-Scientific periodicals or Publications	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Introduction					
2	Decomposers: Phytoscavengers					
3	Omnivorous					
4	Zoo-scavengers and forensic entomology					
5	Succession and steps of decomposition					
6	Dung feeders					
7	Water pollution.					
8	Insect as bio-indicators of water pollution					

Course Coordinator Prof. Dr.

Ehab M. AbouZied

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For

Insects and healthy of environment(2)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z454	Title	Insects and healthy of environment(2)			Level	4	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	1		

2- Overall aims of the course

1	• Comparison of the economic impact of insect pests in agricultural crops and forests with the social and economic value of insects.
2	• Principles of pest management theory, emphasizing insect monitoring, sampling, and economic decision levels

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	appreciate the reasons why some insects become pests.
	a2	understand the balance between beneficial and harmful species.
	a3	provide the intellectual tools to evaluate whether particular species might be causing economic damage, and will learn about the social, historic, cultural, and economic importance of insects
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify the most important pests injuring fruits, vegetables, and field crop through general appearance and symptoms. Describe the life history and host range of the each pest.
	b2	Understand the interactions between pest and host plant.



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	b3	Describe the past, current and promising new practices for pest management for each situation.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Collect the different agricultural pests through the field trips..	
	c2	process, and store insects for studying	
d-General and transferable skills: At the end of the course the student should be able to:	d1	assist student to work in groups	
	d2	communicate with each other in preparing reports	
4-Contents	1	Principles of Field Crop Insect Control -Causes of Insect outbreak	
	2	- Types of Control	
	3	- Major Field Crop Pests. A. Major Pests of Corn.	
5- Teaching and learning method	1	Interactive presentations (Lectures with discussion)	☐
	2	- Home works, reports and discussion groups	☐
	3	. Lab work.	☐



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6- Teaching and learning methods for students with limited capacity		Not Avaliable.	
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes			
b-Essential Books(text books)	1	INSECT PESTS OF FIELD CROPS MP28. COOPERATIVE EXTENSION SERVICE. College of Agriculture, The University of Wyoming. Department of plant science.	
c-Suggested Books			
d-Scientific periodicals or Publications			

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Principles of Field Crop Insect Control -Causes of Insect outbreak	1	a1, a2, a3	b1-b2-b3	c1-c2	d1- d2
2	- Types of Control	2	a1, a2, a3,	b1-b2-b3	c1-c2	d1- d2
3	- Major Field Crop Pests. A. Major Pests of Corn.	3	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2

Course Coordinator Prof. Dr.

Mayada Mosaed Ghareeb



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Faculty of Science



Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For

Embriology,Formation and Insect Metamorphosis

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z445	Title	Embriology,Formation and Insect Metamorphosis			Level	4	Semester	1 or 2
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	recognize the meaning of the embryology
	a2	Recognize the meaning of metamorphosis.
	a3	know the scientific expressions used in the science of embryology different components of number and kinds of insects present
	a4	Know the origin of all insect organs and systems.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Correlate the Embryonic development of the insect with various physiological functions, morphological characters and behavior.
	b2	Correlated the Endocrine system of different Insects.
	b3	Correlated the different processes of metamorphosis
	b4	plan to solve the problems due to hazardous effects of the pollution



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use the acquired knowledge in a broad spectrum of professional fields including: Biology; pest control, taxonomy, medical research, physiology etc.	
	c2	Manipulate the insect in its early stages of development with an understanding of all the internal and external characteristics that share in categorizing it as an insect of agricultural, economical or medical importance.	
	c3	collect different stages of insects specimens from different habitats using suitable tools (aquatic nets, pitfall traps or aerial nets)	
d-General and transferable skills: At the end of the course the student should be able to:	d1	The student could think about solving any problems dealing with different stages of embryonic development and insect endocrine.	
	d2	Students working in team and with supervisor to solve problems in manipulating extreme minute sizes of biological systems.	
4-Contents	1	Introduction	
	2	Cleavage and blastoderm	
	3	Germ band	
	4	Gastrulation- Ectodermal derivatives	
	5	Mesodermal derivatives	
	6	Morphogenesis	
	7	Comparison between different types of metamorphosis in insects	
	8	Developmental stages- revision	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion.	☐
	3	Scientific Visits	☐
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment	1	Final-term Examination	



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	2	Practical Examination		
	3	Mid-Term Examination		
	4	Oral Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Practical Examination	14	
	3	Mid-Term Examination	8	
	4	Oral Examination	13	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Practical Examination	10	20.00%
	3	Mid-Term Examination	2.5	5.00%
	4	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Embryology of Insects by: Johansen and Butt		
	2	Developmental Systems by: J. Counce		
	3	Insects: Structure and Function by: R. F. Chapma		
	4	Entomology by C. Gillot		
c-Suggested Books				
d-Scientific periodicals or Publications	1	https://en.wikipedia.org/wiki/Dung_beetle		
	2	https://en.wikipedia.org/wiki/Scavenger		
	3	http://itc2.utk.edu/web/jgrant/InsectIntro/HumanImpactPositive.htm		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Introduction	1	a1 , a2 ,			
2	Cleavage and blastoderm	2,3	a1 , a2 , a4 ,	b3 ,	c3 ,	d1 , d2 ,
3	Germ band	4	a1 , a3 , a4 ,	b3 ,	c3 ,	d1 , d2 ,



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4	Gastrulation- Ectodermal derivatives	4-7	a1 , a2 , a3 , a4 ,	b2 , b3 ,	c3 ,	d1 , d2 ,
5	Mesodermal derivatives	8,9	a3 , a4 ,	b1 , b2 ,	c3 ,	d1 , d2 ,
6	Morphogenesis	10,11	a2 , a4 ,	b2 , b3 ,	c3 ,	d1 , d2 ,
7	Comparison between different types of metamorphosis in insects	12	a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
8	Developmental stages- revision	13,14	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 ,	c1 , c2 , c3 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Adel A. AbouEl-Ela**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

QA FFSFU DB



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Course Specification For **Biotechnology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z414	Title	Biotechnology			Level	4	Semester	
Lecture (h/w)	1	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

- 1 The overall aim of this course is to provide students with knowledge of and practical skills in the application of Molecular and Systems Biology-approaches across Biotechnology disciplines and to provide students with experience of undertaking biotechnology-related research, in particular in relation to medical, environmental and industrial biotechnology.
- 2 Biotechnology is the scientific manipulation of living organisms, especially at the molecular genetic level. One of the biggest applications of biotechnology is the genetic engineering of certain food crops to incorporate desirable traits in them, such as disease or pest resistance.
- 3 Computers are used to closely study the genetic structure of organisms and tools such as the 'gene gun' are used to introduce desirable genes into the DNA of organisms. Biotechnology is also vital to the medical field in creating new medicines, as well as applicable to the environmental sector, for example in the development of bacteria that consume toxic chemicals and reduce pollution. There are also much older forms of biotechnology that include biological techniques used for brewing wine and beer, and for making bread and cheese.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Evaluate methods of gene manipulation in living organisms, Critically evaluate protocols used for microbial cultivation and culture scale up.
	a2	-Demonstrate theoretical and conceptual understanding of applications of microbial and cellular biotechnology.
	a3	Analyse contributions of biotechnology in medical, agriculture and environment
	a4	Critically review ethical issues in biotechnology including impact on society and the environment
	a5	- the dynamic nature of inter-relationships between biotechnology topics, the role, importance and application of Molecular and Systems Biology-approaches within and across Biotechnology
	a6	the importance of microorganisms, microbial products and processes in biotechnology
	a7	- comprehension and communication of the quality of life benefits that developments in biotechnology facilitate.
b- Intellectual skills: At the end of the course the student should be able to:	b1	To develop skills for scientific investigation while exploring the biology of animal cell
	b2	- To learn skills for doing science - hypothesize , animal experiments , make observations , collect , analyze and present data, write scientific reports using the accepted format
	b3	To produce graduates who have the ability to identify, formulate, and solve open-ended problems with Biotechnology
c-Professional and practical skills: At the end of the course the student should be able to:	c1	work safely, autonomously and effectively in the laboratory
	c2	Summarize, analyze, synthesize and evaluate information.
	c3	Use information ethically.
	c4	undertake a suite of molecular biology methods and prepare scientific reports that present the research findings established using these methods
	c5	Using basic laboratory techniques and equipment necessary to prepare the students for future work.
	c6	Students gain the understanding of professional and ethical responsibility



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	c7	Students receive the broad education necessary to understand the impact Biotechnology solutions in a global, economic, environmental, and societal context	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work effectively in a team	
	d2	Work effectively in a team b2- Using Different tools to analyze data related to biology and future science including Molecular Biology	
	d3	Students will be assigned into groups and will be expected to present group work in class on various topics	
	d4	An online discussion group will be available to all students of the course to exchange ideas.	
	d5	Gather, organize information including the use of information technology where applicable.	
4-Contents	1	Introduction to biomolecules.	
	2	Cloning vectors/expression vectors	
	3	Gen transfer Methods	
	4	Genomic and cDNA library	
	5	Gene regulation	
	6	Diagnosis of Diseases	
	7	Gene therapy	
	8	Gene technique products	
	9	Gene technique and ecosystem protection	
5- Teaching and learning method	1	lecture	✓
	2	Open Discussion.	✓
	3	Practical.	✓
	4	Homework	✓



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6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-Term Examination		
	3	Oral Examination.		
	4	Practical Examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-Term Examination	8	
	3	Oral Examination.		
	4	Practical Examination	14	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination.	2.5	5.00%
	4	Practical Examination	10	20.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to	1	a1 ,			



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	biomolecules.					
2	Cloning vectors/expression vectors	2	a1 , a2 ,			d1 , d2 , d3 , d4 , d5 ,
3	Gen transfer Methods	3	a1 , a2 ,		c1 , c2 , c3 , c4 , c5 , c6 ,	
4	Genomic and cDNA library	4,5	a1 , a2 ,		c1 , c2 , c3 , c4 , c5 , c6 ,	
5	Gene regulation	6,7	a1 , a2 , a3 , a4 , a5 , a6 , a7 ,	b1 , b3 ,		d1 , d2 , d3 , d4 , d5 ,
6	Diagnosis of Diseases	8,9	a1 , a2 , a3 , a4 , a5 , a6 , a7 ,			d1 , d2 , d3 , d4 , d5 ,
7	Gene therapy	10,11			c1 , c2 , c3 , c4 , c5 , c6 ,	d1 , d2 , d3 , d4 , d5 ,
8	Gene technique products	12,13			c1 , c2 , c3 , c4 , c5 , c6 , c7 ,	
9	Gene technique and ecosystem protection	14		b2 ,	c1 , c2 , c3 , c4 , c5 , c6 , c7 ,	

Course Coordinator Prof. Dr. **Mohamed Wasim Khalil**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Fish Biology**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z446	Title	Fish Biology			Level	4	Semester	Elective course
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course provides the students with comprehensive education and essential knowledge in biology of fishes

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate scientific facts, concepts, principles, theories and techniques related to fishes.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze biological qualitative and quantitative data with proper tools within a theoretical framework for assessments of fish biology and ecology
	b2	Assess the concepts, principles, procedures, theories and their interrelationships for solving marine ecology problems
c-Professional and practical skills: At the end of the course the student should be able to:	c1	- Implement field training and reporting for solving problems in marine studies, considering responsibility and scientific ethics.
	c2	Handle marine samples in appropriate forms considering



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d-General and transferable skills: At the end of the course the student should be able to:	d1	- Employ recent technologies, models and theories effectively in marine ecology field.	
	d2	- Lead team work effectively for solving problems; appreciating the values of independent thinking, continuous learning, time management, collaboration, neatness, property rights, ethics and traditions.	
4-Contents	1	Morphology of different fish groups	
	2	Basic classification of fish groups	
	3	Anatomy of bony and cartilaginous fish	
	4	Respiration	
	5	Food and feeding habits	
	6	Reproductive biology	
5- Teaching and learning method	1	lecture	☒
	2	Discussion.	☒
	3	Practical.	☒
	4	Homework	☒
6- Teaching and learning methods for students with limited capacity			Not Avaliable.
7-Student Assessment Methods			
a-Using Assessment			
b-Assessment Schedule			
c-Weighting of Assessments			
8-List of References			
a-Course notes	1	Hand out	
	2	General notes by Staff members of Zoology Department	



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b-Essential Books(text books)	1	. Bond, C.E 1996 Biology of fishes. Brooks Cole; 2nd edition 768pp
c-Suggested Books	1	•Harry, W.E and Williams D.Y. (1992).Principles of Fishery Science .Second Edition. Comstock Publishing, Ithaca, London. 349p.
	2	Gupta S.K and Gupta P.C. (2006).General and applied Ichthyology.(Fish and Fisheries) Published by S. Chand & Company, India. 1133p.
	3	Adesulu E.A and Sydenham D.H.G (2007).The Fresh water Fishes and Fisheries on Nigeria. Macmillian Nigeria publishers, Nigeria. 397p
d-Scientific periodicals or Publications	1	Journal of Fish Biology
	2	Environmental Biology of Fishes

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Morphology of different fish groups	1 - 2	a1 ,			d1 , d2 ,
2	Basic classification of fish groups	3 - 4	a1 ,			d1 , d2 ,
3	Anatomy of bony and cartilaginous fish	5 - 6		b1 , b2 ,	c1 , c2 ,	
4	Respiration	7 - 10	a1 ,		c1 , c2 ,	
5	Food and feeding habits	11 - 12	a1 ,	b1 , b2 ,	c1 , c2 ,	
6	Reproductive biology	13-14			c1 , c2 ,	d1 , d2 ,

Course Coordinator Prof. Dr. **Khalid Hussein Zaghloul**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For **Natural Protectorate**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z472	Title	Natural Protectorate			Level	4	Semester	Elective course
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course provides the students with comprehensive education and essential knowledge in natural protectorates to be qualified for public sector and real job market. Furnish ground for students to be recognized nationally through out starting achievements related to environmental affairs.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate scientific facts, concepts, principles, theories and techniques related to natural protectorate.
	a2	Interpret data and processes related to the structure and function of the different ecosystems
	a3	Illustrate the relationships between ecosystems and the environment
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze biological qualitative and quantitative data with proper tools within a theoretical framework for assessments of natural protectorate areas.



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	b2	Assess the concepts, principles, procedures, theories and their interrelationships for solving protectorate problems	
	b3	Estimate the ecosystem characteristics, fundamentals of productivity, conservation, economics and sustainability	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Implement field training and reporting for solving problems of protectorate areas.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop independent investigative skills by using textbooks and other sources (Internet, Library,..)	
	d2	interact with other people and to engage in team –working	
4-Contents	1	Protected areas worldwide and in Egypt	
	2	Factors affecting natural protectorates management	
	3	Monitoring methods for nature reserves	
	4	Monitoring methods for nature reserves	
	5	Park rangers and their duties and tasks	
	6	Case study: Ras Mohamed Protected area Qaroun and Napq Protectorates	
5- Teaching and learning method	1	lecture	☒
	2	Discussion.	☒
	3	Practical. The laboratory will complement the course. Field trips to different protectorates will be organized	☒
	4	Homework	☒
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final-term Examination	
	2	Mid-term Examination	



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	3	Practical Examination		
	4	oral examination		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-term Examination	8	
	3	Practical Examination	13	
	4	oral examination	10	
c-Weighting of Assessments	1	Final-term Examination	35	70.00%
	2	Mid-term Examination	2.5	5.00%
	3	Practical Examination	10	20.00%
	4	oral examination	2.5	5.00%
8-List of References				
a-Course notes	1	Hand out		
	2	General notes by Staff members of Zoology Department		
b-Essential Books(text books)	1	Tisdell, C. A. (2005). Economics of environmental conservation. Edward Elgar Publishing, USA, 155 pp. 8.b. 1. The World Conservation Monitoring Center (1992). Protected areas of the world. IUCN, Volume 4, 466 pp.		
c-Suggested Books	1	Tisdell, C. A. (2005). Economics of environmental conservation. Edward Elgar Publishing, USA, 155 pp.		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Protected areas worldwide and in Egypt	1 - 2	a1 , a2 ,	b1 ,	c1 ,	d1 ,
2	Factors affecting natural protectorates management	3 - 4	a3 ,	b2 , b3 ,	c1 ,	d1 , d2 ,



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3	Monitoring methods for nature reserves	5 - 6	a2 ,	b1 ,	c1 ,	d1 , d2 ,
4	Monitoring methods for nature reserves	7 - 8	a2 ,	b1 ,	c1 ,	d1 , d2 ,
5	Park rangers and their duties and tasks	9 - 12	a3 ,	b3 ,	c1 ,	d2 ,
6	Case study: Ras Mohamed Protected area Qaroun and Napq Protectorates	13 - 14	a3 ,	b2 , b3 ,	c1 ,	d2 ,

Course Coordinator Prof. Dr. **Khalid Hussein Zaghloul**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **biological analysis**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	Z413	Title	biological analysis			Level	4	Semester	
Lecture (h/w)	1	Practical (h/w)	3	Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course provides students with a broad overview to the basic biochemical, molecular and immunological techniques that are commonly used in modern biomedical research. Lectures will describe the theories and principals behind each of the methods in addition to discussing the practical aspects and limitations in executing the various procedures.

3- intended learning outcomes (ILOs)

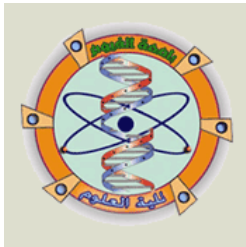
a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Identify the different scientific methods in bio laboratory methods
	a2	To gain the ability to collate samples organize the methods and instruments used to isolate and purify proteins and nucleic acids.
	a3	To gives the student a thorough and detailed overview of the various instruments in the modern laboratory. Will describe some basic methods used to analyze proteins and provide an overview on protein purification.
	a4	will describe the basic procedures used in molecular biology including gene cloning, PCR and sequence analysis.
	a5	Realize basic biochemical procedures and equipment.



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		Understanding these basic biochemical principals will assist in the subsequent discussions on proteins and nucleic acids.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Introduces students to the design of experiments and analysis of data. A combination of lecture, reading and discussion will be used to cover a variety of experimental situations occurring frequently in modern biology.
	b2	This course is designed for transfer students intending to major in science or those looking to expand their laboratory experience with current molecular techniques. In addition to academic subjects covered, laboratory safety, solution preparation, and the process of ethical science will also be addressed
	b3	Interpreting in a professional manner a lab report
	b4	To discuss the information, data and images gained from different experiments to reach accurate descriptions.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	have laboratory experiences in biological modern fields, purification, adjusting puffers and solution concentrations and describing the results.
	c2	The ability to acquire, develop, employ and integrate a range of technical, practical and professional skills, in appropriate and ethical ways within a professional context, autonomously and collaboratively and across a range of disciplinary and professional areas, e.g. time management skills, personal organisation skills.
	c3	Design and conduct simple experiments in cell biology and genetics, analyse and evaluate their results and create graphical and tabular summaries that facilitate understanding of the experimental outcomes.
	c4	The course is designed for Students that are expected to have college level preparation in zoolog molecular biology and/or physiology
d-General and transferable skills: At the end of the course the student should be able to:	d1	Work effectively in a team
	d2	Students will be assigned into groups and will be expected to present group work in class on various topics
	d3	An online discussion group will be available to all students of the course to exchange ideas.
	d4	Gather, organize information including the use of information technology where applicable



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4-Contents	1	pH and buffers
	2	Centrifugation and RCF calculation
	3	Fluorescence, and Cytofluorometry
	4	Precipitation of proteins Procedure for (NH ₄) ₂ SO ₄ precipitation
	5	Salting out and protein dialysis and protein assays
	6	Chromatography ,Basic Principals - Adsorption Chromatography
	7	Ion Exchange, Chromatography, Gel Filtration Chromatography, Affinity Chromatography
	8	Protein Electrophoresis
	9	Nucleic Acids Electrophoresis

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5- Teaching and learning method	
6- Teaching and learning methods for students with limited capacity	Not Available.
7-Student Assessment Methods	
a-Using Assessment	
b-Assessment Schedule	
c-Weighting of Assessments	
8-List of References	
a-Course notes	
b-Essential Books(text books)	
c-Suggested Books	
d-Scientific periodicals or Publications	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	pH and buffers	1	a1 , a2 , a5 ,	b2 , b3 , b4 ,	c2 , c3 , c4 ,	d1 ,
2	Centrifugation and RCF calculation	2	a1 , a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
3	Fluorescence, and Cytofluorometry	3	a1 , a2 , a3 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,



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4	Precipitation of proteins Procedure for (NH ₄) ₂ SO ₄ precipitation	4, 5	a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
5	Salting out and protein dialysis and protein assays	6, 7	a1 , a2 , a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
6	Chromatography ,Basic Principals - Adsorption Chromatography	8, 9	a1 , a2 , a3 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
7	Ion Exchange, Chromatography, Gel Filtration Chromatography, Affinity Chromatography	10, 11	a1 , a2 , a3 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
8	Protein Electrophoresis	12	a3 , a4 , a5 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,
9	Nucleic Acids Electrophoresis	13	a2 , a3 , a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 , c4 ,	d1 , d2 , d3 , d4 ,

Course Coordinator Prof. Dr.

Mohamed Wasim Khalil

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016



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Course Specification For

Group theory

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C471	Title	Group theory			Level	4	Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	This course provides an introduction to the basics and applications of symmetry and group theory in chemistry. Students will learn the mathematical skills behind group theory, symmetry operations and their physical implications in quantum mechanics and molecular structure determination.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define Mathematical groups
	a2	Understand Basic properties of groups
	a3	Identify Abelian and cyclic groups
	a4	Great orthogonality theorem
	a5	Understand structures of Clusters and cages
	a6	Explain electronic structure of High and low spin complexes
	a7	Understand and apply Selection rules of electronic transitions
	a8	The role of vibronic coupling in electronic transitions



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>b1</td><td>Identify Symmetry elements and operations</td></tr> <tr><td>b2</td><td>Classify symmetry operators</td></tr> <tr><td>b3</td><td>Use Reproducible and irreproducible representations</td></tr> <tr><td>b4</td><td>Use Matrices as representation of geometric transformation operators</td></tr> <tr><td>b5</td><td>Determine orthogonal matrices</td></tr> <tr><td>b6</td><td>Use Symmetry operators to explain transition probabilities</td></tr> <tr><td>b7</td><td>Apply subgroups to explain Jahn teller effect</td></tr> </table>	b1	Identify Symmetry elements and operations	b2	Classify symmetry operators	b3	Use Reproducible and irreproducible representations	b4	Use Matrices as representation of geometric transformation operators	b5	Determine orthogonal matrices	b6	Use Symmetry operators to explain transition probabilities	b7	Apply subgroups to explain Jahn teller effect														
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c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>c1</td><td>Perform different mathematical operations on matrices</td></tr> <tr><td>c2</td><td>Form Subgroups and supergroups</td></tr> <tr><td>c3</td><td>Assign point groups of different molecules</td></tr> <tr><td>c4</td><td>Perform Similarity transformations</td></tr> <tr><td>c5</td><td>Calculate Character of a matrix</td></tr> <tr><td>c6</td><td>Construct Character tables</td></tr> <tr><td>c7</td><td>Determine matrices Inverse</td></tr> <tr><td>c8</td><td>Calculate Direct product</td></tr> <tr><td>c9</td><td>Construct Symmetry operators</td></tr> <tr><td>c10</td><td>Use Projection operators in the construction of SALCs</td></tr> <tr><td>c11</td><td>Develop MO diagram of complexes with different geometries</td></tr> <tr><td>c12</td><td>Develop Atomic and molecular electronic states</td></tr> <tr><td>c13</td><td>Mix internal coordinates in normal modes</td></tr> <tr><td>c14</td><td>Develop and apply Selection rules of molecular vibrations.</td></tr> </table>	c1	Perform different mathematical operations on matrices	c2	Form Subgroups and supergroups	c3	Assign point groups of different molecules	c4	Perform Similarity transformations	c5	Calculate Character of a matrix	c6	Construct Character tables	c7	Determine matrices Inverse	c8	Calculate Direct product	c9	Construct Symmetry operators	c10	Use Projection operators in the construction of SALCs	c11	Develop MO diagram of complexes with different geometries	c12	Develop Atomic and molecular electronic states	c13	Mix internal coordinates in normal modes	c14	Develop and apply Selection rules of molecular vibrations.
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d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr><td>d1</td><td>Character tables</td></tr> <tr><td>d2</td><td>MO (Huckel) theory</td></tr> <tr><td>d3</td><td>Ligand field theory</td></tr> <tr><td>d4</td><td>Operators in QM</td></tr> <tr><td>d5</td><td>Use Cyclic and translational groups to explain Band structures of solids</td></tr> </table>	d1	Character tables	d2	MO (Huckel) theory	d3	Ligand field theory	d4	Operators in QM	d5	Use Cyclic and translational groups to explain Band structures of solids																		
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4-Contents	<table border="1"> <tr> <td>1</td> <td>Introduction to Group Theory Mathematical Groups Subgroups and Classes</td> </tr> </table>	1	Introduction to Group Theory Mathematical Groups Subgroups and Classes																										
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	2	Identification of Molecular Point Groups, n-Dimensional Vector Spaces, The Transformation of Functions and Operators, Representations of Symmetry Operators		
	3	The Great Orthogonality Theorem Characters and Character Tables		
	4	Group Theory and Quantum Mechanics, Operators, symmetry aspects		
	5	Projection of Basis Functions, Direct Product Representations, Identification of Zero Matrix Elements		
	6	Group Theory and Hybridization, Symmetry Adapted Molecular Orbitals		
	7	A Group Theoretical Analysis of Ammonia, SALCs of π Systems: Benzene, Hückel Molecular Orbital Theory		
	8	Ligand field theory		
	9	Normal Coordinates and Normal Modes, The Symmetry of Molecular Vibrations, Selection Rules for Vibrational Transitions		
5- Teaching and learning method	1	Lecture	☐	
	2	Open Discussion	☐	
	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	45	90.00%
	3	Oral Examination	2.5	5.00%



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8-List of References		
a-Course notes		
b-Essential Books(text books)	1	Cotton, F.A. Chemical Applications of Group Theory, 2nd Ed.; Wiley: New York, 1971.
	2	Carter, R.L. Molecular Symmetry and Group Theory, Wiley: New York, 1998.
	3	Atkins, P.W.; Friedman, R.S. Molecular Quantum Mechanics, 3rd Ed.; Oxford University Press: New York, 1999.
	4	Tinkham, M. Group Theory and Quantum Mechanics, McGraw-Hill; New York, 1964
	5	Hamermesh, M. Group Theory and its Application to Physical Problems, Addison-Wesley: Reading, MA, 1962.
c-Suggested Books	1	Walton, Beginning group theory for chemistry McWeeny, R. Symmetry: An Introduction to Group Theory and its Applications, Macmillan: New York, 1963.
	2	McQuarrie, D.A.; Simon, J.D. Physical Chemistry: A Molecular Approach; University Science Books: Sausalito, CA, 1997.
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to Group Theory Mathematical Groups Subgroups and Classes	1, 2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	



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2	Identification of Molecular Point Groups, n-Dimensional Vector Spaces, The Transformation of Functions and Operators, Representations of Symmetry Operators	3, 4, 5		b3 , b4 ,	c3 , c4 ,	
3	The Great Orthogonality Theorem Characters and Character Tables	6	a4 ,	b5 ,	c5 , c6 ,	
4	Group Theory and Quantum Mechanics, Operators, symmetry aspects	7				
5	Projection of Basis Functions, Direct Product Representations, Identification of Zero Matrix Elements	8			c7 , c8 , c9 ,	
6	Group Theory and Hybridization, Symmetry Adapted Molecular Orbitals	9			c10 ,	
7	A Group Theoretical Analysis of Ammonia, SALCs of π Systems: Benzene, Hückel Molecular Orbital Theory	10, 11	a3 ,			d1 ,
8	Ligand field theory	12	a5 , a6 , a7 , a8 ,	b6 , b7 ,	c11 , c12 ,	d2 ,
9	Normal Coordinates and Normal Modes, The Symmetry of Molecular Vibrations, Selection Rules for Vibrational Transitions	13, 14			c13 , c14 ,	d3 , d4 ,

Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied



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Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Chemistry of refractories and building materials (A)(Elective)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C444	Title	Chemistry of refractories and building materials (A)(Elective)			Level	4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	The overall aims of the study of this course is: To study and understand types, chemical composition and enhancement of cement, concrete and refractories, and their industrial applications.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Demonstrate knowledge of definition, chemical composition and types of cement, concrete and refractories .
	a2	Know the effect of nanoparticles on cement and concrete.
	a3	Demonstrate knowledge of industrial applications of refractories.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Differentiate between types of cement, concrete and refractories.
	b2	Employ computational software's and data-processing skills in handling of chemical information and analysis of chemical data.
	b3	Analyze chemical data to identify and confirm chemical structures as well as determine chemical composition.



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	b4	Propose and conclude mechanisms for physical and chemical processes
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Assess hazards associated with the use of chemical materials of cement, concrete and refractories
	c2	Monitor the chemical properties or changes, including systematic recording and technical reporting.
	c3	Use computational packages and tools in chemical investigations
d-General and transferable skills: At the end of the course the student should be able to:	d1	Recognize the role of Basic Sciences in the development of society
	d2	Develop scientific approaches that meet community needs considering economic, environmental, social, ethical, and safety requirements.
	d3	Utilize scientific facts and theories to analyze and interpret practical data.
	d4	Collect, analyze, and present data using appropriate formats and techniques
	d5	Postulate concepts and choose appropriate solutions to solve problems on scientific basis
	d6	Apply effectively information technology relevant to the field
	d7	Participate effectively in a multidisciplinary team work and be flexible for adaptation, decision making and working under contradictory
	d8	Have knowledge and experience of working with relevant and advanced laboratory technique
	d9	Participate in and review quality control processes, manage risks and organize time to finish jobs.
	d10	Demonstrate wide background knowledge related to the different branches of chemistry.
4-Contents	1	Cement: Definition, History, Types, Chemical Composition and Hydration, Nanoparticles in cement.
	2	Concrete: Preparation, Properties, Types, Concretes with and without nanoparticles, curing, defects and chemistry.



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	3	Refractory Overview: - Types of Refractories - Insulating Refractories - Selection of Refractories - Heat Loss and Energy Conservation - Refractory Applications in Industry		
	4	Revision		
5- Teaching and learning method	1	lecture	☐	
	2	Open Discussion	☐	
	3	Scientific Visits	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-Term Examination		
	3	Oral Examination.		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-Term Examination	8	
	3	Oral Examination.	14	
c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Mid-Term Examination	25	50.00%
	3	Oral Examination.	2.5	5.00%
8-List of References				
a-Course notes	1	Course notes by lecture Prof.		
b-Essential Books(text books)	1	minerals admixtures in cement and cancrete		
c-Suggested Books	1	FM Lee 3rd ed		



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d-Scientific periodicals or Publications	

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Cement: Definition, History, Types, Chemical Composition and Hydration, Nanoparticles in cement.	1-4	a1 , a2 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 , d9 , d10 ,
2	Concrete: Preparation, Properties, Types, Concretes with and without nanoparticles, curing, defects and chemistry.	5-8	a1 , a2 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 , d9 , d10 ,
3	Refractory Overview: - Types of Refractories - Insulating Refractories - Selection of Refractories - Heat Loss and Energy Conservation - Refractory Applications in Industry	9-13	a1 , a3 ,	b1 , b2 , b3 , b4 ,	c1 , c2 , c3 ,	d1 , d2 , d3 , d4 , d5 , d6 , d7 , d8 , d9 , d10 ,
4	Revision	14				

Course Coordinator Prof. Dr. Saleh Abd El-Aleem Mohamed

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **chemical Corrosion**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C445	Title	chemical Corrosion			Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2		

2- Overall aims of the course

1	Understand the main concepts,corrosion
2	Aware to the dangerous of corrosion.
3	Know the factors effect on corrosion process.
4	study thermodynamic corrosion
5	Know Pourbaix diagram and its limitation.
6	Study kinetic corrosion and polarization phenomina.
7	Draw Tafel line and determine mixed potential.
8	Determaine the corrosion rate.
9	be aware of the forms of corrosion of metals and its mechanism .
10	Know the different methods to protect the metals and allays from corrosion

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain the main knowledges and curves.
	a2	know the factors affect the corrosion process.
	a3	differentiate between thermodynamic and kinetic behavior of corrosion
	a4	Calculate the corrosion rate.
	a5	explain how to protect the metals and alloys from corrosion
	a6	enumerate the forms of corrosion and its mechanism.
b- Intellectual skills: At the end of the course the student should be able to:	b1	get information in both lectures and library.
	b2	solve some exercises to apply the studied laws in course
	b3	compare the forms of corrosion
	b4	determine the rate of corrosion
	b5	Protect the metal from corrosion
c- Professional and practical skills: At the end of the course the student should be able to:	c1	control the factors affect corrosion process.
	c2	measure and determine the rate of corrosion.
	c3	solve different problems related to corrosion.
	c4	use the suitable tools to distinguish between the forms of corrosion.
	c5	Use the different methods to protect the metals from corrosion.
d- General and transferable skills: At the end of the course the student should be able to:	d1	a void corrosion of metals.
	d2	write a report.
	d3	Solve the different problems
	d4	Work in a team
	d5	Use the computer
	d6	Communicate with topics and internet
4-Contents	1	Definition of corrosion, Types of anodic and cathodic reactions.
	2	Thermodynamic corrosion, The potential / P H diagram of water.
	3	Thermodynamic calculations with Zn and Cu.
	4	Pourbaix diagram for Zn /H ₂ O , Fe/ H ₂ O.
	5	Limitation of thermodynamic treatment.
	6	Kinetic treatment of polarization.



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	7	Hydrogen system of polarization and Tafel lines.		
	8	Mixed potential Zn in HCl & Fe in HCl.		
	9	Calculations the rate of corrosion.		
	10	Forms of protection of Metals catholic protection, impressed current and stray current.		
	11	Anodic protection and change variables experiments		
	12	Adsorption inhibitors.		
	13	Forms of corrosion.		
	14	revision		
5- Teaching and learning method	1	lecture	☐	
	2	Discussion	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	45	90.00%
	3	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Lectures notes and hand out notes to the students part by part		



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b-Essential Books(text books)	1	Essential physical chemistry , B.S Bahl
	2	Corrosion for Science and engineering, KennethrTrethewey
c-Suggested Books	1	"Physical chemistry" in the library.
d-Scientific periodicals or Publications	1	Library -Web sitesen.wikipedia.org/wiki/corrosion

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Definition of corrosion, Types of anodic and cathodic reactions.	1	a1 ,	b1 ,	c1 ,	d1 , d2 , d4 ,
2	Thermodynamic corrosion, The potential / P H diagram of water.	2	a1 , a2 , a3 ,	b1 , b2 ,	c1 ,	d1 , d2 ,
3	Thermodynamic calculations with Zn and Cu.	3	a3 ,	b2 ,	c1 ,	d2 , d3 ,
4	Pourbaix diagram for Zn / H2O , Fe/ H2o.	4	a1 , a3 ,	b2 ,	c1 , c3 ,	d1 ,
5	Limitation of thermodynamic treatment.	5	a3 , a1		c1 , c3 ,	d2 ,
6	Kinetic treatment of polarization.	6	a1 ,	b1 , b2 ,	c2 ,	d4 , d6 ,
7	Hydrogen system of polarization and Tafel lines.	7	a1 ,	b1 ,	c2 , c3 ,	d3 , d4 ,
8	Mixed potential Zn in HCl & Fe in HCl.	8	a1 , a5 ,	b1 , b2 , b4 ,	c2 , c3 ,	d2 , d5 ,
9	Calculations the rate of corrosion.	9	a1 , a4 ,	b1 , b4 ,	c2 ,	d3 , d4 ,



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10	Forms of protection of Metals cathodic protection, impressed current and stray current.	10	a6 ,	b3 ,	c4 ,	d1 , d2 , d3 , d4 ,
11	Anodic protection and change variables experiments	11	a5 ,	b5 ,	c5 ,	d1 , d2 , d4 ,
12	Adsorption inhibitors.	12	a1 , a5 ,	b5 ,	c5 ,	d1 , d2 , d4 ,
13	Forms of corrosion.	13	a6 ,	b3 ,	c4 ,	d4 , d6 ,
14	revision	14	a1 , a2 , a3 , a4 , a5 , a6 ,	b1 , b2 , b3 , b4 , b5 ,	c1 , c2 , c3 , c4 , c5 ,	d1 , d2 , d3 , d4 , d5 , d6 ,

Course Coordinator Prof. Dr. **Nadia HelalYehia**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016

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Course Specification For **Chromatography and its Applications**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C451	Title	Chromatography and its Applications		Level	4	Semester	1
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

- 1 Build a solid foundation to be followed on the course and understanding the concept of Chromatographic analysis.
- 2 Understand the main concepts for separation mechanism
- 3 differentiate between the general remarks of each various kinds of chromatographic analysis
- 4 Understand the definitions of chromatographic terms.
- 5 Understand the properties of the elution techniques.
- 6 Understand the theories of chromatographic development.
- 7 Classify the different types of chromatography.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:

- a1 Write the principle of chromatography , the types of stationary and mobile phases, modes of interaction with matter .
- a2 Explain the theoretical principles of different types of Chromatographic analysis
- a3 Write the different methods of column and planner thin-layer chromatography



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	<table> <tr> <td>a4</td><td>Discuss the importance of HPLC plumbing</td></tr> <tr> <td>a5</td><td>Explain the HPLC techniques that utilizes affinity chromatography properties</td></tr> <tr> <td>a6</td><td>Get knowledge for the role of electrophoresis in separation of biochemical analytes</td></tr> </table>	a4	Discuss the importance of HPLC plumbing	a5	Explain the HPLC techniques that utilizes affinity chromatography properties	a6	Get knowledge for the role of electrophoresis in separation of biochemical analytes						
a4	Discuss the importance of HPLC plumbing												
a5	Explain the HPLC techniques that utilizes affinity chromatography properties												
a6	Get knowledge for the role of electrophoresis in separation of biochemical analytes												
b- Intellectual skills: At the end of the course the student should be able to:	<table> <tr> <td>b1</td><td>Record information and data from the libraries .</td></tr> <tr> <td>b2</td><td>Select a wave length for the analysis .</td></tr> <tr> <td>b3</td><td>Compare between adsorption, partition, ion-exchanges and size exclusion chromatography.</td></tr> <tr> <td>b4</td><td>Compare between gas and liquid chromatography</td></tr> <tr> <td>b5</td><td>Evaluate advantages and disadvantages of the various GC detectors</td></tr> </table>	b1	Record information and data from the libraries .	b2	Select a wave length for the analysis .	b3	Compare between adsorption, partition, ion-exchanges and size exclusion chromatography.	b4	Compare between gas and liquid chromatography	b5	Evaluate advantages and disadvantages of the various GC detectors		
b1	Record information and data from the libraries .												
b2	Select a wave length for the analysis .												
b3	Compare between adsorption, partition, ion-exchanges and size exclusion chromatography.												
b4	Compare between gas and liquid chromatography												
b5	Evaluate advantages and disadvantages of the various GC detectors												
c-Professional and practical skills: At the end of the course the student should be able to:	<table> <tr> <td>c1</td><td>Gain access to information from the library and internet</td></tr> <tr> <td>c2</td><td>Show logical thinking and be self independent in problems solving</td></tr> <tr> <td>c3</td><td>Know how the analytes are separated, identified and determined.</td></tr> </table>	c1	Gain access to information from the library and internet	c2	Show logical thinking and be self independent in problems solving	c3	Know how the analytes are separated, identified and determined.						
c1	Gain access to information from the library and internet												
c2	Show logical thinking and be self independent in problems solving												
c3	Know how the analytes are separated, identified and determined.												
d-General and transferable skills: At the end of the course the student should be able to:	<table> <tr> <td>d1</td><td>Discuss the nature of various separation mechanisms.</td></tr> <tr> <td>d2</td><td>Collect data from a range of sources.</td></tr> <tr> <td>d3</td><td>Write a report.</td></tr> </table>	d1	Discuss the nature of various separation mechanisms.	d2	Collect data from a range of sources.	d3	Write a report.						
d1	Discuss the nature of various separation mechanisms.												
d2	Collect data from a range of sources.												
d3	Write a report.												
4-Contents	<table> <tr> <td>1</td><td>General introduction Chromatography, Chromatographic definitions</td></tr> <tr> <td>2</td><td>Modes of Chromatographic Developments: Frontal, Displacement and elution analysis</td></tr> <tr> <td>3</td><td>Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography</td></tr> <tr> <td>4</td><td>Classification of column techniques: Gas and liquid chromatography</td></tr> <tr> <td>5</td><td>Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gas Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.</td></tr> <tr> <td>6</td><td>Interfacing Gas Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique</td></tr> </table>	1	General introduction Chromatography, Chromatographic definitions	2	Modes of Chromatographic Developments: Frontal, Displacement and elution analysis	3	Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography	4	Classification of column techniques: Gas and liquid chromatography	5	Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gas Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.	6	Interfacing Gas Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique
1	General introduction Chromatography, Chromatographic definitions												
2	Modes of Chromatographic Developments: Frontal, Displacement and elution analysis												
3	Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography												
4	Classification of column techniques: Gas and liquid chromatography												
5	Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gas Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.												
6	Interfacing Gas Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique												



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	7	Liquid chromatography: high performance liquid chromatography (HPLC), HPLC Pumps, HPLC Columns, Mobile Phases, HPLC Plumbing, Detectors for HPLC, Quantitative Applications		
	8	Techniques by separation mechanism (Stationary Phase): Adsorption, partition, ion-exchange, size exclusion and Affinity chromatography chromatography		
	9	Supercritical fluid chromatography, Ion Chromatography (IC)		
	10	Electrophoresis		
	11	Micellar Electrokinetic Capillary Chromatography		
5- Teaching and learning method	1	lecture	☐	
	2	Discussion	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-Term Examination		
	3	Oral Examination		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-Term Examination	15	
	3	Oral Examination	13	
c-Weighting of Assessments	1	Mid-Term Examination	2.5	5.00%
	2	Final-Term Examination	45	90.00%
	3	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Course notes taken form essential text books written by Dept. stuff		



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b-Essential Books(text books)	1	Modern Analytical chemistry D. Harvey, Instrumental Method of Chemical Analysis. Golen W. Ewing.
c-Suggested Books		
d-Scientific periodicals or Publications	1	Library and inter net.

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	General introduction Chromatography, Chromatographic definitions	1	a1 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,
2	Modes of Chromatographic Developments: Frontal, Displacement and elution analysis	2	a1 ,	b1 , b2 , b3 ,	c1 , c2 ,	d1 , d2 ,
3	Classification of Chromatography: planner chromatography: paper and thin layer chromatography, column chromatography: gas and liquid chromatography	3	a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
4	Classification of column techniques: Gas and liquid chromatography	4	a1 , a2 ,	b3 , b4 , b5 ,	c1 , c2 ,	d2 , d3 ,



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5	Gas chromatography: mobile phase, Particle Size of Supports, GC columns, Sample Introduction, Temperature Control, Detectors for Gas Chromatography: flame ionization detector, thermal conductivity detector, electron capture detector.	5	a1 , a2 ,	b1 , b2 , b3 ,	c1 , c2 ,	d3 ,
6	Interfacing Gas Chromatography with Spectroscopic Methods- Hyphenated CG technique with mass spectrometry (GC-MS), Quantitative Applications of GC technique	6	a1 , a2 ,	b4 , b5 ,	c2 , c3 ,	d1 , d2 ,
7	Liquid chromatography: high performance liquid chromatography (HPLC), HPLC Pumps, HPLC Columns, Mobile Phases, HPLC Plumbing, Detectors for HPLC, Quantitative Applications	7	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 ,
8	Techniques by separation mechanism (Stationary Phase): Adsorption, partition, ion-exchange, size exclusion and Affinity chromatography chromatography	8, 9	a1 , a2 , a4 ,	b1 , b2 , b5 ,	c1 , c2 , c3 ,	d1 , d2 ,
9	Supercritical fluid chromatography, Ion Chromatography (IC)	10, 11	a1 , a2 , a3 ,	b1 , b2 ,	c1 , c2 , c3 ,	d1 , d2 , d3 ,
10	Electrophoresis	12, 13	a6 ,	b2 , b4 ,	c1 , c2 , c3 ,	d3 ,
11	Micellar Electrokinetic Capillary Chromatography	14	a1 , a2 , a4 ,	b1 ,	c2 , c3 ,	d1 , d2 ,



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Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For

Pesticides and herbicides Chemistry (2)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Chemistry
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	C4217	Title	Pesticides and herbicides Chemistry (2)		Level	4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	Principles of Pesticides will provide opportunities for students to gain a basic knowledge of pesticides and their use. The course is not designed for students to memorize chemical structures, and its synthesis but to gain a practical working knowledge of all types of pesticides used primarily in agricultural and horticultural settings. Emphasis

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	have a thorough knowledge of the history of pest management, particularly the specific role pesticides have served in the development of management strategies.
	a2	have a knowledge of pesticide families and be able to differentiate among families based on their specific modes of activity.
	a3	have a thorough knowledge of synthesis of different types of insecticides and herbicides.
	a4	understand the mode of action of each type on insects and weeds.
	a5	understand the potential hazards to humans, wildlife, and the environment by the use of pesticides.



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b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify and explain the different types of pesticides
	b2	Identify and explain the synthetic ways of insecticides and herbicides.
	b3	Identify and explain the mode of action of insecticides and herbicides on different insects and weeds.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Spectroscopic Characterization Identification of organic compounds and pesticides on the basis of given UV, IR, PMR and Mass data.
	c2	Collection, identification and classification of different insect pests- study about nature of damage and their management. (Field visits).
	c3	Collection, identification and classification of different Weeds - study about nature of damage and their management
	c4	Synthesis of pesticides/ analogs
	c5	Pesticides analysis
d-General and transferable skills: At the end of the course the student should be able to:	d1	mangement time
	d2	work in time
4-Contents	1	Pest & Pest Management 1. Definition, importance & general classification of agrochemicals. Classification of pesticides on chemical nature and according to target species, mode of action. 2. Definition of insect and classification of insects (orders) 3.Introduction, classification of pests. Damage economic threshold level Life cycle, morphology, nature of damage and management of following pests 4. Methods of pest controls – Classification: Natural & applied control [Physical, mechanical, cultural, biological, genetic, regulatory, chemical controls. 5.Herbs/Weeds- definition, classification, life cycle, methods of weed control- Physical, cultural, biological, mechanical, chemical



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	2	Insecticides – Definition, Classification, Synthesis. 1. Synthetic Organic Chemistry - Retrosynthetic approach, synthone approaches, types of disconnections. Retrosynthesis of Agrochemicals. 2. Chemistry of insecticides: Brief introduction to classes of insecticides, structure, chemical name, physical properties, chemical properties, synthesis, degradation, metabolism, formulations, mode of action, uses, toxicity. 3. synthesis of Chlorinated insecticide (DDT, Rhothane, Methoxychlor, Aldrin, Dieldrin, Chlordane, Lindane), Mode of action on insect	
	3	carbamate insecticides – Synthesis of Carbaryl, Methiocarb, Aldicarb, Methomyl, Isolan, Mode of action on insect.	
	4	Synthetic pyrethroids– Synthesis of Allethrin, Phenothrin, Proparthrin, Resmethrin, Bifenthrin, Permethrin, Cypermethrin, Deltamethrin, Mode of action on insect.	
	5	Organophosphorus insecticides– synthesis of Phosphamidon, Dichlorvos, Naled, Phosdrin, Diazinon, Fenthion, Disulfoton, Phorate, Trichlorfon, Mode of action on insect	
	6	Insecticides of natural origin – Botanical insecticides- Extraction of Nicotine, Rotenone, pyrethrins. Herbicides – Basic Classification of Herbicides, synthesis of Acetochlor, Atrazine, Metolachlor, Propanil	
5- Teaching and learning method	1	lecture	☐
	2	Open Discussion	☐
	3	Scientific Visits	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final Examination	to assess understanding and Intellectual skills
	2	Mid-Term Examination	To assess understanding and Intellectual skills
	3	Oral Exam.	
b-Assessment Schedule	1	Final Examination	15
	2	Mid-Term Examination	8
	3	Oral Exam.	14



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c-Weighting of Assessments	1	Final Examination	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Exam.	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Pesticides in Agriculture and the Environment. 2002. Editor : Willis B. Wheeler. Publisher : Marcel Dekker Inc.		
c-Suggested Books	1	Pesticide Synthesis- P.S.Marg, G.K.Kohn, J.J.Menn		
d-Scientific periodicals or Publications	1	Papers distributed or assigned as convenient		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	Pest & Pest Management 1. Definition, importance & general classification of agrochemicals. Classification of pesticides on chemical nature and according to target species, mode of action. 2. Definition of insect and classification of insects (orders) 3. Introduction, classification of pests. Damage economic threshold level Life cycle, morphology, nature of damage and management of following pests 4. Methods of pest controls	1,2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 ,



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	– Classification: Natural & applied control [Physical, mechanical, cultural, biological, genetic, regulatory, chemical controls. 5.Herbs/Weeds- definition, classification, life cycle, methods of weed control- Physical, cultural, biological, mechanical, chemical					
2	Insecticides – Definition, Classification, Synthesis. 1. Synthetic Organic Chemistry - Retrosynthetic approach, synthone approaches, types of disconnections. Retrosynthesis of Agrochemicals. 2. Chemistry of insecticides: Brief introduction to classes of insecticides, structure, chemical name, physical properties, chemical properties, synthesis, degradation, metabolism, formulations, mode of action, uses, toxicity. 3.synthesis of Chlorinated insecticide(DDT,Rhothane, Methoxychlor, Aldrin, Dieldrin, Chlordane, Lindane), Mode of action on insect	3	a2 , a3 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c5 ,	d1 , d2 ,



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3	carbamate insecticides –Synthesis of Carbaryl, Methiocarb, Aldicarb, Methomyl, Isolan, Mode of action on insect.	4-6	a2 , a3 ,	b1 , b2 , b3 ,	c1 , c5 ,	d1 , d2 ,
4	Synthetic pyrethroids– Synthesis of Allethrin, Phenothrin, Proparthrin, Resmethrin, Bifenthrin, Permethrin, Cypermethrin, Deltamethrin, Mode of action on insect.	7,8	a2 , a3 ,	b1 , b2 , b3 ,		d1 , d2 ,
5	Organophosphorus insecticides– synthesis of Phosphamidon, Dichlorvos, Naled, Phosdrin, Diazinon, Fenthion, Disulfoton, Phorate, Trichlorfon, Mode of action on insect	9,10	a2 , a4 , a5 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c5 ,	d1 , d2 ,
6	Insecticides of natural origin – Botanical insecticides- Extraction of Nicotine, Rotenone, pyrethrins. Herbicides – Basic Classification of Herbicides, synthesis of Acetochlor, Atrazine, Metolachlor, Propanil	11-13	a2 , a5 ,	b1 , b2 , b3 ,	c1 , c2 , c3 , c5 ,	d1 , d2 ,

Course Coordinator Prof. Dr. Ibrahim Essam El-Shamy

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

FACULTY REQUIREMENT



Fayoum Univeristy
Faculty of Science



Course Specification For **History of science**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Major
Department offering the program	Zoology
Department offering the course	Zoology
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP110	Title	History of science			Level		Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		2	

2- Overall aims of the course

1	The overall aim of the study of this course is: In this course, the history of science is studied, starting from the origins of science in ancient Mesopotamia, Egypt and Greece to present day science and technology.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Describe the main stages in the changing nature and organization of science, from the Ancient Greeks to the early Twentieth Century.
	a2	Recognizes the important contribution of the Arabs in various sciences.
	a3	Describe the scientific innovations of the Industrial Revolution.
	a4	Explain some of the effects of technology on modern society.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Describe the forces which brought about the Scientific Revolution, and the Industrial Revolution.
	b2	Compare and contrast beliefs associated with early and Renaissance science.
	b3	Compare modern and past examples of science.



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	b4	Explain some of the effects of technology on modern society.	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Analyzes different information.	
	c2	Formulated an opinion on contemporary intellectual issues.	
d-General and transferable skills: At the end of the course the student should be able to:	d1	Communicate effectively.	
	d2	Work in a research team.	
	d3	Use the Internet to find information.	
4-Contents	1	Introduction to the History of Science: Origins of science in ancient times (Mesopotamia, Egypt, Greece...: Pythagoras, Aristotle, Euclid, Archimedes, Heron of Alexandria,..)	
	2	Golden Age of Islam.	
	3	Renaissance & age of enlightenment (philosophers: Bacon, Descartes; scientists: Kepler, Copernicus, Galileo, Vesalius).	
	4	The Scientific Revolution.	
	5	Science During the Industrial Revolution.	
	6	World Wars - The Information Age.	
5- Teaching and learning method	1	Lecturer (Data show projectors)	☐
	2	Students' contributions to discussions on lecture materials.	☐
	3	Tutorial exercises compose of a mixture of multiple choice-type and short questions, practical tasks.	☐
	4	Encourage students to use online and library resources.	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final-term Examination	comprising various formats of questions aiming to access the accuracy of information provided by student with respect



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			to the content covered in lectures.	
	2	Oral Examination.		
	3	semester work		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Oral Examination.	10	
	3	semester work	on all weeks	
c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Oral Examination.	2.5	5.00%
	3	semester work	2.5	5.00%
8-List of References				
a-Course notes	1	Power point slides Lecture notes by the instructor. Students are expected to take notes during the lectures.		
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications	1	A list with suggested readings Additional Requirements: Computer with Internet is required for this course.		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to the History of Science: Origins of science in ancient times (Mesopotamia, Egypt, Greece...: Pythagoras, Aristotle, Euclid, Archimedes, Heron of Alexandria,..)	1-4	a1 , a2 , a3 , a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 ,	d1 , d2 , d3 ,
2	Golden Age of Islam.	5-6	a2 ,		c1 , c2 ,	d1 , d2 , d3 ,



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3	Renaissance & age of enlightenment (philosophers: Bacon, Descartes; scientists: Kepler, Copernicus, Galileo, Vesalius).	7-9			c1 , c2 ,	d1 , d2 , d3 ,
4	The Scientific Revolution.	10,11	a3 , a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 ,	d1 , d2 , d3 ,
5	Science During the Industrial Revolution.	12,13	a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 ,	d1 , d2 , d3 ,
6	World Wars - The Information Age.	14	a4 ,	b1 , b2 , b3 , b4 ,	c1 , c2 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr. Naglaa El-Sayed Rifaat Ismael

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016

QA FSFU DB



Fayoum Univeristy
Faculty of Science



Course Specification For دراسات اسلامية ١ (النظم الاسلامية)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP121	Title	دراسات اسلامية ١ (النظم الاسلامية)	Level		Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	دراسة النظم التي تتطلبها الحياة في ظل الإسلام من مثل النظام السياسي والنظام الاجتماعي والنظام التعليمي.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	يعرف المنهاج الإسلامي في أصوله وفي خصائصه المميزة له عن غيره من المناهج الأخرى وفيما ينبثق عنه من قيم ونظم وفكر.
	a2	يعرف الدارس الحقوق والواجبات لكل من الفرد والمجتمع
	a3	يعرف الطالب نظم الحياة الاجتماعية والاقتصادية والسياسية في ضوء الإسلام
	a4	إعداد المسلم البصير بدينه في كافة جوانب الحياة المختلفة.
	a5	إصلاح الجانب الاجتماعي والقدرة على مجابهة كافة التحديات.



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b- Intellectual skills: At the end of the course the student should be able to:							
c-Professional and practical skills: At the end of the course the student should be able to:							
d-General and transferable skills: At the end of the course the student should be able to:							
4-Contents	<table border="1"> <tr> <td>1</td><td> مدخل تعريفى بالنظم الإسلامية: -تعريف بالنظم -أهمية النظام في حياة البشر -أهداف النظم الإسلامية -شمول الشريعة لجوانب الحياة -تكامل النظم الإسلامية وترابطها </td></tr> <tr> <td>2</td><td> النظم الإسلامية: يمكن الاقتصار على ثلاثة من الأنظمة مفصلة: ١.النظام الاجتماعي: أ.مفهومه. ب.ضرورة الاجتماع البشري ت.أسس النظام الاجتماعي في الإسلام ث.الفرد والمجتمع في الإسلام ج.الأسرة: مكانتها- أسس بنائها- الحقوق والواجبات الأسرية – منهج الإسلام في صيانة الأسرة – المرأة طبيعتها وقضاياها – أهم الشبهات حول نظام الأسرة ومناقشتها. </td></tr> <tr> <td>3</td><td> ٢.النظام السياسي في الإسلام: أ.مفهومه وأهميته ب.مقوماته العقدية والدستورية ت.الدولة في الإسلام : مفهومها – نشأتها – تطورها – عناصرها. ث.السلطة: تعريفها – أنواعها – وظائفها. ج.الرعية: الحقوق والواجبات. ٣.نظام التعليم في الإسلام: أ.مفهوم العلم ب.حكم تعلم العلم ت.الدين والعلم ث.وظيفة العلم ج.فضل العلم ح.فضل طلب العلم وفضل طالبه خ.آداب طالب العلم د.آداب المعلم </td></tr> </table>	1	مدخل تعريفى بالنظم الإسلامية: -تعريف بالنظم -أهمية النظام في حياة البشر -أهداف النظم الإسلامية -شمول الشريعة لجوانب الحياة -تكامل النظم الإسلامية وترابطها	2	النظم الإسلامية: يمكن الاقتصار على ثلاثة من الأنظمة مفصلة: ١.النظام الاجتماعي: أ.مفهومه. ب.ضرورة الاجتماع البشري ت.أسس النظام الاجتماعي في الإسلام ث.الفرد والمجتمع في الإسلام ج.الأسرة: مكانتها- أسس بنائها- الحقوق والواجبات الأسرية – منهج الإسلام في صيانة الأسرة – المرأة طبيعتها وقضاياها – أهم الشبهات حول نظام الأسرة ومناقشتها.	3	٢.النظام السياسي في الإسلام: أ.مفهومه وأهميته ب.مقوماته العقدية والدستورية ت.الدولة في الإسلام : مفهومها – نشأتها – تطورها – عناصرها. ث.السلطة: تعريفها – أنواعها – وظائفها. ج.الرعية: الحقوق والواجبات. ٣.نظام التعليم في الإسلام: أ.مفهوم العلم ب.حكم تعلم العلم ت.الدين والعلم ث.وظيفة العلم ج.فضل العلم ح.فضل طلب العلم وفضل طالبه خ.آداب طالب العلم د.آداب المعلم
1	مدخل تعريفى بالنظم الإسلامية: -تعريف بالنظم -أهمية النظام في حياة البشر -أهداف النظم الإسلامية -شمول الشريعة لجوانب الحياة -تكامل النظم الإسلامية وترابطها						
2	النظم الإسلامية: يمكن الاقتصار على ثلاثة من الأنظمة مفصلة: ١.النظام الاجتماعي: أ.مفهومه. ب.ضرورة الاجتماع البشري ت.أسس النظام الاجتماعي في الإسلام ث.الفرد والمجتمع في الإسلام ج.الأسرة: مكانتها- أسس بنائها- الحقوق والواجبات الأسرية – منهج الإسلام في صيانة الأسرة – المرأة طبيعتها وقضاياها – أهم الشبهات حول نظام الأسرة ومناقشتها.						
3	٢.النظام السياسي في الإسلام: أ.مفهومه وأهميته ب.مقوماته العقدية والدستورية ت.الدولة في الإسلام : مفهومها – نشأتها – تطورها – عناصرها. ث.السلطة: تعريفها – أنواعها – وظائفها. ج.الرعية: الحقوق والواجبات. ٣.نظام التعليم في الإسلام: أ.مفهوم العلم ب.حكم تعلم العلم ت.الدين والعلم ث.وظيفة العلم ج.فضل العلم ح.فضل طلب العلم وفضل طالبه خ.آداب طالب العلم د.آداب المعلم						



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5- Teaching and learning method	1	المحاضرات النظرية	☐	
	2	الحوار والمناقشة	☐	
	3	التعلم التعاوني	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	الاختبار النهائي		
	2	اعمال فصلية		
	3	اختبار شفوي		
b-Assessment Schedule	1	الاختبار النهائي	15	
	2	اعمال فصلية	طوال الترم	
	3	اختبار شفوي	14	
c-Weighting of Assessments	1	الاختبار النهائي	45	90.00%
	2	اعمال فصلية	2.5	5.00%
	3	اختبار شفوي	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	السياسة الشرعية في إصلاح الراعي والرعية، ابن تيمية		
	2	معالم الثقافة الإسلامية، د. عبد الكريم عثمان		
	3	العلم والعلماء، أبو بكر الجزائري		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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Faculty of Science

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	مدخل تعريفي بالنظم الإسلامية: -تعريف بالنظم -أهمية النظام في حياة البشر -أهداف النظم الإسلامية -شمول الشريعة لجوانب الحياة -تكامل النظم الإسلامية وترابطها	1-5	a1 , a2 , a3 , a4 , a5 ,			
2	النظم الإسلامية: يمكن الاقتصار على ثلاثة من الأنظمة مفصلة: ١. النظام الاجتماعي: أ. مفهومه. ب. ضرورة الاجتماع البشري ت. أسس النظام الاجتماعي في الإسلام ث. الفرد والمجتمع في الإسلام ج. الأسرة: مكانتها- أسس بنائها- الحقوق والواجبات الأسرية – منهج الإسلام في صيانة الأسرة – المرأة طبيعتها وقضاياها – أهم الشبهات حول نظام الأسرة ومناقشتها.	6-9	a1 , a2 , a3 , a4 , a5 ,			
3	٢. النظام السياسي في الإسلام: أ. مفهومه وأهميته ب. مقوماته العقدية والدستورية ت. الدولة في الإسلام : مفهومها – نشأتها – تطورها – عناصرها ث. السلطة: تعريفها – أنواعها – وظائفها. ج. الرعاية: الحقوق والواجبات. ٣. نظام التعليم في الإسلام: أ. مفهوم العلم ب. حكم تعلم العلم ت. الدين والعلم ث. وظيفة العلم ج. فضل العلم ح. فضل طلب العلم وفضل طالبه خ. آداب طالب العلم د. آداب المعلم	10-13	a1 , a2 , a3 , a4 , a5 ,			



Fayoum Univeristy

Faculty of Science



Course Coordinator Prof. Dr.

Program Coordinator Prof. Dr.

Ehab Moaz Abouzied

Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

QA FSFU DB



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Course Specification For **Health and occupational safety (Elective)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP133	Title	Health and occupational safety (Elective)			Level		Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		2	

2- Overall aims of the course

1	Identify occupational hazards in laboratories, Identify measures for laboratory safty, infection control, Identify ways of spreading of infectious disease and dealing with health and occupational hazards.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Explain epidemiological cycle
	a2	Enumerate reservoir of infection
	a3	Define carrier
	a4	Identify host suitability to disease
	a5	Identify different modes of transmission of disease
	a6	Explain mode of disease prevention and control
	a7	Identify ways of spreading of infectious disease
	a8	Explain role and responsibility of laboratory team infection control
	a9	Identify measures for laboratory safty
	a10	Define occupational health
	a11	Enumerate occupational hazards in laboratories
	a12	Identify items included on occupational health program



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	a13	Understand methods of communication
b- Intellectual skills: At the end of the course the student should be able to:	b1	Apply preventive measures for infectious disease
	b2	Apply control measure for infectious disease
	b3	Apply safety measures in laboratories
	b4	Evaluate infection control measures in laboratories
	b5	Evaluate occupational health program in laboratories
	b6	Practice proper communication with colleges and costumers in labs
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Use appropriate safety measures in laboratories
	c2	Use infection control measures in laboratories
	c3	Mange occupational hazards
d-General and transferable skills: At the end of the course the student should be able to:	d1	work coherently and successfully as a part of a team
	d2	Gain a communication skills
	d3	Study and find information independently
	d4	manager time
	d5	Find effective and realistic solutions for work problems through analysis of input and right anticipation
4-Contents	1	Epidemiological cycle
	2	Reservoir of infection
	3	Mode of transmission
	4	Exposed host
	5	Prevention of infectious disease
	6	Spread of infection
	7	Control of infectious disease
	8	Laboratory safety
	9	Occupational health
	10	Occupational hazards and disease
	11	Occupational hazards management
	12	Infection control



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	13	Communication skills		
5- Teaching and learning method	1	lecture	☐	
	2	Discussions	☐	
	3	Demonstrations	☐	
6- Teaching and learning methods for students with limited capacity			Not Avaliable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Mid-Term Examination		
	3	Oral Examination.		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Mid-Term Examination	8	
	3	Oral Examination.	8	
c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination.	2.5	5.00%
8-List of References				
a-Course notes	1	course notes of "health and occupational safety" by Dr. Naglaa Abd Elkhalek Elsherbiny and Dr/ Asmaa Younis Elsayed .		
b-Essential Books(text books)				
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Epidemiological cycle	1	a1 ,			
2	Reservoir of infection	1	a2 , a3 ,			
3	Mode of transmission	2	a4 ,			
4	Exposed host	3	a5 ,			
5	Prevention of infectious disease	3,4	a6 ,	b1 ,		d1 ,
6	Spread of infection	4,5	a7 ,			
7	Control of infectious disease	5	a6 ,	b2 ,		
8	Laboratory safety	6,7	a8 , a9 ,	b3 ,	c1 ,	
9	Occupational health	8,9	a10 ,			
10	Occupational hazards and disease	10	a11 ,	b5 ,	c3 ,	d5 ,
11	Occupational hazards management	11	a12 ,			d4 ,
12	Infection control	12	a13 ,	b4 ,	c2 ,	d3 ,
13	Communication skills	13	a13 ,	b6 ,		d1 , d2 ,

Course Coordinator Prof. Dr. Asmaa Younis Elsayed .

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



Fayoum Univeristy
Faculty of Science



Course Specification For **Environmental Studies**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Botany
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP151	Title	Environmental Studies		Level		Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2	

2- Overall aims of the course

1	The course is designed to acquaint the students how different disciplines of basic sciences can be integrated to deal with different issues relevant to environment

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define different types of wastes
	a2	List sources of wastes
	a3	Memorize the harmful effects of waste on Health and environment
	a4	Specify traditional and modern methods for waste disposal
b- Intellectual skills: At the end of the course the student should be able to:	b1	Interpret different types of wastes
	b2	Compare sources of wastes.
	b3	Analyse the harmful effects of waste on Health and environment
	b4	Evaluate traditional and modern methods for waste disposal



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	Employ research techniques, information retrieval, modeling, taxonomic keys, bioassays and tools of molecular biology.		
d-General and transferable skills: At the end of the course the student should be able to:	d1	Use information and communication technology effectively.		
4-Contents	1	Different types of wastes: solid, liquid, radioactive, gaseous		
	2	Sources of wastes: domestic, industrial, agricultural		
	3	Harmful effects of waste on human Health		
	4	Effects of waste on the environment		
	5	Traditional methods for waste disposal		
	6	Modern Methods for waste disposal		
5- Teaching and learning method	1	Lectures	☐	
	2	Discussion	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Oral exam		
	3	Student activity		
b-Assessment Schedule	1	Final written exam	15	
	2	Oral exam	14	
	3	Student activity	on all weeks	
c-Weighting of Assessments	1	Final written exam	45	90.00%
	2	Oral exam	2.5	5.00%
	3	Student activity	2.5	5.00%



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8-List of References		
a-Course notes	1	prepared by Dept. stuff
b-Essential Books(text books)	1	Williams, Paul T. Waste treatment and disposal. John Wiley & Sons, 2013.
c-Suggested Books		
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Different types of wastes: solid, liquid, radioactive, gaseous	1-3	a1 ,	b1 ,		
2	Sources of wastes: domestic, industrial, agricultural	4,5	a2 ,	b2 ,	c1 ,	
3	Harmful effects of waste on human Health	6,7	a3 ,	b3 ,		
4	Effects of waste on the environment	9,10	a3 ,	b3 ,	c1 ,	d1 ,
5	Traditional methods for waste disposal	11,12	a4 ,	b4 ,		
6	Modern Methods for waste disposal	13,14	a4 ,	b4 ,	c1 ,	d1 ,

Course Coordinator Prof. Dr. **Mohamed. A. Karam**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Adel Abd Al Hakim**

Date: 2016



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Course Specification For

Statistics

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	Mathematics
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP161	Title	Statistics			Level		Semester	
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		2	

2- Overall aims of the course

1	By the end of this course, the students will be able to demonstrate knowledge, apply and analysis the basic concepts of Probability and Statistics

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Illustrate data collection.
	a2	Define Measures of central tendency.
	a3	Define Measures of Dispersion.
	a4	Define percentiles, quarterlies and deciles.
	a5	Explain random experiments, events and their probabilities.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Analyze and solve the problem by using Statistics.
	b2	Apply the probability theory.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Solve problems to the course material by using statistics and probability laws.
	c2	Record data and information from libraries related to Statistics.



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d-General and transferable skills: At the end of the course the student should be able to:	d1	Write a report with the standard scientific guidelines.	
	d2	Work coherently and successfully as a part of a team in project.	
	d3	Use appropriate computer program, packages and download on line data.	
	d4	gain a communication skills (present reports in seminars, workshops or group meeting).	
	d5	study and find information independently.	
	d6	manager its time	
4-Contents	1	General introduction to the basic concepts in statistics	
	2	Organizing methods (tab) and display the data	
	3	Measures of central tendency	
	4	Measures of dispersion	
	5	Site Metrics (percentiles, Rabaat (quarterlies) , deciles	
	6	Introduction to probability theory	
5- Teaching and learning method	1	Lecture	☐
	2	Discussion	☐
	3	Practical	☐
	4	Semester work	☐
6- Teaching and learning methods for students with limited capacity			Not Available.
7-Student Assessment Methods			
a-Using Assessment	1	Final-term Examination	
	2	Mid-Term Examination	
	3	Oral Examination.	
b-Assessment Schedule	1	Final-term Examination	15
	2	Mid-Term Examination	8
	3	Oral Examination.	12



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c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Mid-Term Examination	2.5	5.00%
	3	Oral Examination.	2.5	5.00%
8-List of References				
a-Course notes				
b-Essential Books(text books)	1	Introduction To Statistics and Data Analysis By Roxy Peck, Chris Olsen, Jay L. Devore, 2011		
c-Suggested Books				
d-Scientific periodicals or Publications	1	Math world:http://mathworld.wolfram.com		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	General introduction to the basic concepts in statistics	1	a1 ,	b1 ,	c2 ,	d1 , d2 ,
2	Organizing methods (tab) and display the data	2-4	a1 ,	b1 ,	c2 ,	d2 , d3 ,
3	Measures of central tendency	5-7	a2 ,	b1 ,	c1 , c2 ,	d4 , d5 ,
4	Measures of dispersion	8-10	a3 ,	b1 ,	c2 ,	d5 , d6 ,
5	Site Metrics (percentiles, Rabaat (quarterlies) , deciles	11,12	a4 ,	b1 ,	c2 ,	d6 ,
6	Introduction to probability theory	13,14	a5 , a5 ,	b2 ,	c2 ,	d6 ,

Course Coordinator Prof. Dr. **Badr**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**



Fayoum Univeristy

Faculty of Science



Head of department: Prof. Dr.

Adel Abd Al Hakim

Date: 2016

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Course Specification For **Research Methodology and proposal writing**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	General
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP132	Title	Research Methodology and proposal writing	Level	3 or 4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1	1. Provide the student with the definition and steps of scientific research and its ethics.
2	How to make a literature review based on scientific guidance.
3	How to write and present a scientific report.

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Define and describe the importance of educational research
	a2	Identify the type of research designs associated with quantitative and qualitative research.
	a3	Discuss important ethical issues in conducting research.
	a4	Recognize skills needed to design and conduct research.
	a5	Define a research problem and explain its importance in a study.
	a6	Recognize potential ethical issues in experimental research.
b- Intellectual skills: At the end of the course the student should be able to:	b1	Identify strategies useful in writing a “statement of the problem” section.
	b2	Analyzing and interpreting either quantitative or qualitative data.



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	<table> <tr> <td>b3</td><td>Create from a scientific point of view reasonable and well. documented plan for a qualified project.</td></tr> <tr> <td>b4</td><td>Develop a research proposal following suitable qualitative research methodologies.</td></tr> <tr> <td>b5</td><td>Specifying a purpose and research questions or hypotheses.</td></tr> </table>	b3	Create from a scientific point of view reasonable and well. documented plan for a qualified project.	b4	Develop a research proposal following suitable qualitative research methodologies.	b5	Specifying a purpose and research questions or hypotheses.												
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b5	Specifying a purpose and research questions or hypotheses.																		
c-Professional and practical skills: At the end of the course the student should be able to:	<table> <tr> <td>c1</td><td>Write a scientific qualified article within a limited topic.</td></tr> <tr> <td>c2</td><td>Reviewing the literature.</td></tr> <tr> <td>c3</td><td>Identifying a research problem.</td></tr> <tr> <td>c4</td><td>Collecting either quantitative or qualitative data.</td></tr> <tr> <td>c5</td><td>Reporting and evaluating the research.</td></tr> </table>	c1	Write a scientific qualified article within a limited topic.	c2	Reviewing the literature.	c3	Identifying a research problem.	c4	Collecting either quantitative or qualitative data.	c5	Reporting and evaluating the research.								
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c3	Identifying a research problem.																		
c4	Collecting either quantitative or qualitative data.																		
c5	Reporting and evaluating the research.																		
d-General and transferable skills: At the end of the course the student should be able to:	<table> <tr> <td>d1</td><td>Develop capability in using information and communication technology for tasks associated with information access and presentation, and data analysis.</td></tr> <tr> <td>d2</td><td>Develop capability in using information and communication technology for tasks associated with information access and presentation, and data analysis.</td></tr> <tr> <td>d3</td><td>Improve communication skills through working in groups and enhancement of collaborative learning by discussions, seminars and collective reports.</td></tr> <tr> <td>d4</td><td>Consider community linked problems, ethics and traditions.</td></tr> <tr> <td>d5</td><td>Acquire self-directed and lifelong learning.</td></tr> <tr> <td>d6</td><td>Consider intellectual property rights such as scientific patents and copyrights.</td></tr> </table>	d1	Develop capability in using information and communication technology for tasks associated with information access and presentation, and data analysis.	d2	Develop capability in using information and communication technology for tasks associated with information access and presentation, and data analysis.	d3	Improve communication skills through working in groups and enhancement of collaborative learning by discussions, seminars and collective reports.	d4	Consider community linked problems, ethics and traditions.	d5	Acquire self-directed and lifelong learning.	d6	Consider intellectual property rights such as scientific patents and copyrights.						
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4-Contents	<table> <tr> <td>1</td><td>Chapter 1: Process of conducting research</td></tr> <tr> <td>2</td><td>Chapter 2: Identifying a research problem</td></tr> <tr> <td>3</td><td>Chapter 3: Reviewing the literature</td></tr> <tr> <td>3</td><td>Chapter 3: Reviewing the literature</td></tr> <tr> <td>5</td><td>Chapter 5: Collecting quantitative data</td></tr> <tr> <td>6</td><td>Chapter 6: Analyzing and interpreting of quantitative data</td></tr> <tr> <td>7</td><td>Chapter 7: Collecting qualitative data</td></tr> <tr> <td>8</td><td>Chapter 8: Analyzing and interpreting of qualitative data</td></tr> <tr> <td>9</td><td>Chapter 9: Reporting and evaluating research</td></tr> </table>	1	Chapter 1: Process of conducting research	2	Chapter 2: Identifying a research problem	3	Chapter 3: Reviewing the literature	3	Chapter 3: Reviewing the literature	5	Chapter 5: Collecting quantitative data	6	Chapter 6: Analyzing and interpreting of quantitative data	7	Chapter 7: Collecting qualitative data	8	Chapter 8: Analyzing and interpreting of qualitative data	9	Chapter 9: Reporting and evaluating research
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8	Chapter 8: Analyzing and interpreting of qualitative data																		
9	Chapter 9: Reporting and evaluating research																		



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	10	Revision and Discussion		
5- Teaching and learning method	1	Lecturer	☒	
	2	Scientific Visits Open Discussion.	☒	
	3	Open Discussion.	☒	
	4	seminars	☒	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Mid-Term Examination		
	2	Final-term Examination		
	3	Oral Examination.		
b-Assessment Schedule	1	Mid-Term Examination	8	
	2	Final-term Examination	15	
	3	Oral Examination.	13	
c-Weighting of Assessments	1	Mid-Term Examination	5	5.00%
	2	Final-term Examination	90	90.00%
	3	Oral Examination.	5	5.00%
8-List of References				
a-Course notes	1	Course notes prepared by the lecturer.		
b-Essential Books(text books)	1	Educational research : planning, conducting, and evaluating quantitative and qualitative research, John W. Creswell. — 4th ed. Pearson Education, Inc. (2012).		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and under-standing Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Chapter 1: Process of conducting research	1	a1 ,	b3 , b4 ,		d3 , d2 , d5 , d4 , d1 , d6 ,
2	Chapter 2: Identifying a research problem	2	a4 , a5 ,	b3 , b4 , b5 ,	c3 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
3	Chapter 3: Reviewing the literature	3 ,4	a2 , a4 ,	b4 ,	c2 ,	d3 , d2 , d5 , d4 , d1 ,
3	Chapter 3: Reviewing the literature	3,4	a2 , a4 ,	b4 ,	c2 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
5	Chapter 5: Collecting quantitative data	6	a2 , a3 , a6 ,	b2 ,	c4 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
6	Chapter 6: Analyzing and interpreting of quantitative data	7,8	a2 ,	b2 ,	c4 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
7	Chapter 7: Collecting qualitative data	9	a2 , a3 , a6 ,	b2 ,	c4 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
8	Chapter 8: Analyzing and interpreting of qualitative data	10,11	a2 ,	b2 ,	c4 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
9	Chapter 9: Reporting and evaluating research	12,13	a3 , a4 , a6 ,	b3 , b4 , b1 ,	c1 , c2 , c5 ,	d3 , d2 , d5 , d4 , d1 , d6 ,
10	Revision and Discussion	14	a2 , a3 , a4 , a5 , a6 , a1 ,	b3 , b4 , b5 , b1 , b2 ,	c1 , c2 , c3 , c5 , c4 ,	d3 , d2 , d5 , d4 , d1 , d6 ,

Course Coordinator Prof. Dr. **Dr. Ahmed Saad Gomaa Khalil**

Program Coordinator Prof. Dr. **Ehab Moaz Abouzied**

Head of department: Prof. Dr. **Salah Mahrous**

Date: 2016



Fayoum Univeristy
Faculty of Science



Course Specification For دراسات اسلاميه2(قضايا اسلامية)

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP122	Title	دراسات اسلاميه2(قضايا اسلامية)	Level	3 or 4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

2 أن يتعرف الطالب على حكم الإسلام في بعض القضايا المعاصرة أو القديمة

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	أن يتعرف الطالب على مفهوم الشورى في الإسلام وربطه بالمجالس النيابية المعاصرة
	a2	أن يتعرف الطالب على أقوال العلماء في حكم الشورى ، ومناقشة الأدلة والاراء
	a3	أن يتعرف الطالب على الشروط الواجب توافرها في أهل الشورى وكيفية اختيارهم في العصر الحديث
	a4	أن يتعرف الطالب على أدلة مشروعية الشورى في القرآن الكريم والسنة النبوية
	a5	أن يتعرف الطالب على اختصاصات أهل الشورى
	a6	أن يتعرف الطالب على نماذج عملية في تطبيق الشورى في الأمور العامة , الفتوى في عهد الرسول صلى الله عليه وسلم ، وعهد الخلفاء الراشدين رضي الله عنهم



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b- Intellectual skills: At the end of the course the student should be able to:			
c-Professional and practical skills: At the end of the course the student should be able to:			
d-General and transferable skills: At the end of the course the student should be able to:			
4-Contents	1	المقصود بالشورى - الشورى قبل الإسلام - أدلة مشروعية الشورى من القرآن والسنة - منطلقات الشورى النبوية	
	2	الحكم الشرعي للشورى - رأي العلماء في الشورى من حيث الوجوب عدمه : القائلون بوجوبها وأدلتهم - القائلون بالنسب وأدلتهم - الرأي الراجح - هل رأى أغلبية أهل الشورى ملزم للإمام : القائلون بأنه غير ملزم وأدلتهم والرد عليها - القائلون بأنه ملزم وأدلتهم - القائلون بأن الأمر في هذه المسألة يرجع إلى رأي الأمة والرد عليهم.	
	3	أقسام أهل الشورى والشروط الواجب توافرها في أهل الشورى - كيفية اختيار أهل الشورى - أهل الشورى في العصر الحديث (أعضاء المجالس النيابية) أقوال من حرموا المشاركة في الترشيح أو الانتخاب في المجالس النيابية وأدلتهم والرد عليها اختصاصات أهل الشورى - فوائد الشورى بالنسبة للحاكم والمحكومين	
	4	نماذج عملية من تطبيق الشورى في العصر الأول للإسلام في الموضوعات السياسية والأمور العامة .	
	5	الشورى في الفتوى ومشروعيتها - نماذج عملية من الشورى في الفتوى في العصر الأول للإسلام	
5- Teaching and learning method	1	المحاضرة	☐
	2	المناقشة	☐
6- Teaching and learning methods for students with limited capacity		Not Available.	
7-Student Assessment Methods			
a-Using Assessment	1	Semester work	
	2	Final Term Examination	



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	3	Oral Examination		
b-Assessment Schedule	1	Semester work	طوال الفصل الدراسي	
	2	Final Term Examination	15	
	3	Oral Examination	14	
c-Weighting of Assessments	1	Semester work	2.5	5.00%
	2	Final Term Examination	45	90.00%
	3	Oral Examination	2.5	5.00%
8-List of References				
a-Course notes	1	Prepare by department staff		
b-Essential Books(text books)	1	الشورى في ضوء القرآن الكريم ، للدكتور / أحمد عبدالغني محمد النجولي الجمل		
	2	بين الشورى والديمقراطية ، للشيخ محمد علي الجوزي		
c-Suggested Books	1	حقوق الإنسان بين تعاليم الإسلام وإعلان الأمم المتحدة ، للشيخ محمد الغزالي		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	المقصود بالشورى - الشورى قبل الإسلام - أدلة مشروعية الشورى من القرآن والسنة - منطلقات الشورى النبوية	1,2	a1 , a2 ,			



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2	الحكم الشرعي للشورى - رأي العلماء في الشورى من حيث الوجوب عدمه : القائلون بوجوبها وأدلتهم - القائلون بالنسبة وأدلتهم - الرأي الراجح - هل رأى أغلبية أهل الشورى ملزم للإمام : القائلون بأنه غير ملزم وأدلتهم والرد عليها - القائلون بأنه ملزم وأدلتهم - القائلون بأن الأمر في هذه المسألة يرجع إلى رأي الأمة والرد عليهم.	3-5	a2 , a3 ,			
3	أقسام أهل الشورى والشروط الواجب توافرها في أهل الشورى - كيفية اختيار أهل الشورى - أهل الشورى في العصر الحديث (أعضاء المجالس النيابية) أقوال من حرمو المشاركة في الترشيح أو الانتخاب في المجالس النيابية وأدلتهم والرد عليها اختصاصات أهل الشورى - فوائد الشورى بالنسبة للحاكم والمحكومين	6-8	a3 , a4 ,a5			
4	نماذج عملية من تطبيق الشورى في العصر الأول للإسلام في الموضوعات السياسية والأمور العامة .	9-11	, a6			
5	الشورى في الفتوى ومشروعيتها - نماذج عملية من الشورى في الفتوى في العصر الأول للإسلام	12-14	a6 ,			

Course Coordinator Prof. Dr. All Departments

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **Problem-solving & Decision-making + Stress Management**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP131	Title	Problem-solving & Decision-making + Stress Management			Level	3 or 4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		2	

2- Overall aims of the course

1	Build and expand decision making, critical thinking and creative problem solving skills.
2	Make the student able to apply scientific methods and logical reasoning to problems and decisions.
3	•Learn how to use analysis, synthesis, and positive inquiry to address individual and organizational problems and develop the critical thinking skills needed in today's turbulent times.
4	Focus upon stress reducing techniques

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Identify the major steps used under the Scientific Approach to problem solving
	a2	Recognize the qualities that comprise critical thinking and the importance of reasoning
	a3	Identify the four quadrants of the Whole Brain and how these relate to different situations
	a4	Identify the effects of stress on the body
	a5	Identify common barriers that inhibit creative problem solving within organizations



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b- Intellectual skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>b1</td><td>Compare two different four phase approaches to problem solving</td></tr> <tr> <td>b2</td><td>Distinguish different types of feasibilities you can use before making a major investment</td></tr> <tr> <td>b3</td><td>Formulate a Mind Map</td></tr> <tr> <td>b4</td><td>Create the structure and flow of a Decision Tree</td></tr> <tr> <td>b5</td><td>Recognize the intellectual and emotional basis of stress</td></tr> <tr> <td>b6</td><td>Distinguish critical thinking from creative thinking.</td></tr> </table>	b1	Compare two different four phase approaches to problem solving	b2	Distinguish different types of feasibilities you can use before making a major investment	b3	Formulate a Mind Map	b4	Create the structure and flow of a Decision Tree	b5	Recognize the intellectual and emotional basis of stress	b6	Distinguish critical thinking from creative thinking.
b1	Compare two different four phase approaches to problem solving												
b2	Distinguish different types of feasibilities you can use before making a major investment												
b3	Formulate a Mind Map												
b4	Create the structure and flow of a Decision Tree												
b5	Recognize the intellectual and emotional basis of stress												
b6	Distinguish critical thinking from creative thinking.												
c-Professional and practical skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>c1</td><td>Apply different tools for situational analysis</td></tr> <tr> <td>c2</td><td>Apply the Six Thinking Hats to thinking</td></tr> <tr> <td>c3</td><td>Establish some rule you can follow for effective brain storming</td></tr> <tr> <td>c4</td><td>Apply root cause analysis in arriving at the source behind a problem</td></tr> <tr> <td>c5</td><td>Improving Interpersonal Skills</td></tr> </table>	c1	Apply different tools for situational analysis	c2	Apply the Six Thinking Hats to thinking	c3	Establish some rule you can follow for effective brain storming	c4	Apply root cause analysis in arriving at the source behind a problem	c5	Improving Interpersonal Skills		
c1	Apply different tools for situational analysis												
c2	Apply the Six Thinking Hats to thinking												
c3	Establish some rule you can follow for effective brain storming												
c4	Apply root cause analysis in arriving at the source behind a problem												
c5	Improving Interpersonal Skills												
d-General and transferable skills: At the end of the course the student should be able to:	<table border="1"> <tr> <td>d1</td><td>Think independently, set tasks and solve problems on scientific basis.</td></tr> <tr> <td>d2</td><td>Work in groups effectively; manage time, collaborate and communicate with others positively.</td></tr> <tr> <td>d3</td><td>Consider community linked problems, ethics and traditions.</td></tr> <tr> <td>d4</td><td>Acquire self and long life learning</td></tr> <tr> <td>D5</td><td>Apply scientific models, systems, and tools effectively.</td></tr> <tr> <td>D6</td><td>Develop the ability to reduce stress through relaxation techniques</td></tr> </table>	d1	Think independently, set tasks and solve problems on scientific basis.	d2	Work in groups effectively; manage time, collaborate and communicate with others positively.	d3	Consider community linked problems, ethics and traditions.	d4	Acquire self and long life learning	D5	Apply scientific models, systems, and tools effectively.	D6	Develop the ability to reduce stress through relaxation techniques
d1	Think independently, set tasks and solve problems on scientific basis.												
d2	Work in groups effectively; manage time, collaborate and communicate with others positively.												
d3	Consider community linked problems, ethics and traditions.												
d4	Acquire self and long life learning												
D5	Apply scientific models, systems, and tools effectively.												
D6	Develop the ability to reduce stress through relaxation techniques												
4-Contents	<table border="1"> <tr> <td>1</td><td> Introduction to Problem Solving Decision Making and Problem Solving in Organizations Types of Problems and situation analysis Problem analysis and categories of Problem Solving The link between problem solving and decision making Feasibility analysis Four phase approaches </td></tr> <tr> <td>2</td><td> Decision Making Methods Group Decision Making Decision Methods Consensus and Ethical Decisions </td></tr> </table>	1	Introduction to Problem Solving Decision Making and Problem Solving in Organizations Types of Problems and situation analysis Problem analysis and categories of Problem Solving The link between problem solving and decision making Feasibility analysis Four phase approaches	2	Decision Making Methods Group Decision Making Decision Methods Consensus and Ethical Decisions								
1	Introduction to Problem Solving Decision Making and Problem Solving in Organizations Types of Problems and situation analysis Problem analysis and categories of Problem Solving The link between problem solving and decision making Feasibility analysis Four phase approaches												
2	Decision Making Methods Group Decision Making Decision Methods Consensus and Ethical Decisions												



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	3	Thinking styles: Left brain, right brain thinking Critical thinking Creative thinking Whole brain model Thinking hats		
	4	Problem-analysis and decision-making supplementary tools		
	5	Pressure and performance management		
	6	components of wellness - GAS model of stress		
	7	physiological components of stress and your body		
	8	Personality and stress – perfectionism - Irrational beliefs (REBT) - spirituality and stress – optimism - laughter – happiness		
	9	Relaxation strategies, biofeedback, meditation		
5- Teaching and learning method	1	Lecture	☐	
	2	Discussion	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity			Not Available.	
7-Student Assessment Methods				
a-Using Assessment	1	Final-term Examination		
	2	Oral Examination		
	3	semester work		
b-Assessment Schedule	1	Final-term Examination	15	
	2	Oral Examination	14	
	3	semester work		
c-Weighting of Assessments	1	Final-term Examination	45	90.00%
	2	Oral Examination	2.5	5.00%
	3	semester work	2.5	5.00%



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8-List of References		
a-Course notes	1	Prepare by department staff
b-Essential Books(text books)	1	Getting Things Done: The Art of Stress-Free Productivity David Allen (P)2001 Simon & Schuster.
	2	Decision Making and Problem Solving (Creating Success) by John Adair, 2016
	3	Decision Making and Problem Solving in Management Perfect Paperback – 2007. by Robert H. Vaughn.
c-Suggested Books		
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	Introduction to Problem Solving Decision Making and Problem Solving in Organizations Types of Problems and situation analysis Problem analysis and categories of Problem Solving The link between problem solving and decision making Feasibility analysis Four phase approaches	1,2	a1 ,	b1 , b2 ,	c1 , c4 ,	d1 , d2 , d3 , d4 , d5 , d6 ,



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2	Decision Making Methods Group Decision Making Decision Methods Consensus and Ethical Decisions	3,4	a1 ,	b4 ,	c1 ,	d1 , d2 , d3 , d4 , D5 , D6 ,
3	Thinking styles: Left brain, right brain thinking Critical thinking Creative thinking Whole brain model Thinking hats	5,6	a1 , a2 , a3 , a5 ,	b3 , b6 ,	c1 , c2 ,	d1 , d2 , d3 , d4 , D5 , D6 ,
4	Problem-analysis and decision-making supplementary tools	7,8	a1 , a5 ,	b3 , b4 ,	c3 , c4 ,	d1 , d2 , d3 , d4 , D5 , D6 ,
5	Pressure and performance management	9		b5 ,	c5 ,	d1 , d2 , d3 , d4 , D5 , D6 ,
6	components of wellness - GAS model of stress	10	a4 ,			d1 , d2 , d3 , d4 , D5 , D6 ,
7	physiological components of stress and your body	11	a4 ,			d1 , d2 , d3 , d4 , D5 , D6 ,
8	Personality and stress – perfectionism - Irrational beliefs (REBT) - spirituality and stress – optimism - laughter – happiness	12,13		b5 ,	c1 , c5 ,	d1 , d2 , d3 , d4 , D5 , D6 ,
9	Relaxation strategies, biofeedback, meditation	14	a4 ,	b5 ,	c5 ,	d1 , d2 , d3 , d4 , D5 , D6 ,

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Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **الفرص والعمل الجماعي + التخطيط والرقابة**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP134	Title	الفرص والعمل الجماعي + التخطيط والرقابة	Level	3 or 4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

1 يهدف هذا المقرر تعريف الطلاب بأساسيات إدارة الأعمال

3- intended learning outcomes (ILOs)

a- Knowledge and understanding: At the end of the course the student should be able to:	a1	يعدد انواع فرق العمل و صفات فريق العمل الفعال و بناء فريق العمل و مهارات القائد الماهر لفريق العمل و معوقات بناء فريق عمل فعال
	a2	يعرف مفهوم وأغراض ومراحل و مقومات ومعوقات عملية التخطيط
	a3	يتعرف على انواع الرقابة و معوقات الرقابة و مؤشرات ضعف النظام الرقابى و قياس الأداء واتخاذ الإجراءات
b- Intellectual skills: At the end of the course the student should be able to:	b1	يميز بين انواع فرق العمل و صفات فريق العمل الفعال و بناء فريق العمل و مهارات القائد الماهر لفريق العمل و معوقات بناء فريق عمل فعال
	b2	يقارن بين مفهوم عملية التخطيط و أغراض عملية التخطيط و مقومات التخطيط و مراحل إعداد الخطة و معوقات عملية لتخطيط
	b3	يصنف انواع الرقابة و معوقات الرقابة و مؤشرات ضعف النظام الرقابى و قياس الأداء واتخاذ الإجراءات



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c-Professional and practical skills: At the end of the course the student should be able to:	c1	اعداد الخطط والرقابة		
d-General and transferable skills: At the end of the course the student should be able to:	d1	يكتسب مهارات العمل الجماعى		
4-Contents	1	فرق العمل: انواع فرق العمل – صفات فريق العمل الفعال – بناء فريق العمل – مهارات القائد الماهر لفريق العمل – معوقات بناء فريق عمل فعال		
	2	التخطيط : مفهوم عملية التخطيط – أغراض عملية التخطيط – مقومات التخطيط – مراحل إعداد الخطة – معوقات عملية التخطيط		
	3	الرقابة: انواع الرقابة – معوقات الرقابة – مؤشرات ضعف النظام الرقابى – قياس الأداء واتخاذ الإجراءات		
5- Teaching and learning method	1	Lectures	☐	
	2	Discussion	☐	
	3	Homework	☐	
6- Teaching and learning methods for students with limited capacity		Not Availiable.		
7-Student Assessment Methods				
a-Using Assessment	1	Final written exam		
	2	Oral exam.		
	3	Student activity.		
b-Assessment Schedule	1	Final written exam	15	
	2	Oral exam.	14	
	3	Student activity.	during the term	
c-Weighting of Assessments	1	Final written exam	45	90.00%
	2	Oral exam.	2.5	5.00%
	3	Student activity.	2.5	5.00%



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8-List of References		
a-Course notes	1	prepared by Dept. staff
	2	library Periodicals, Web sites, ... etc.
b-Essential Books(text books)		
c-Suggested Books		
d-Scientific periodicals or Publications		

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transfer-able Skills
1	فرق العمل: انواع فرق العمل – صفات فريق العمل الفعال – بناء فريق العمل – مهارات القائد الماهر لفريق العمل – معوقات بناء فريق عمل فعال	1-4	a1 ,	b1 ,	c1 ,	
2	التخطيط : مفهوم عملية التخطيط – أغراض عملية التخطيط – مقومات التخطيط – مراحل إعداد الخطة – معوقات عملية التخطيط	5-9	a2 ,	b2 ,		d1 ,
3	الرقابة: انواع الرقابة – معوقات الرقابة – مؤشرات ضعف النظام الرقابي – قياس الأداء واتخاذ الإجراءات	9-14	a3 ,	b3 ,	c1 ,	

Course Coordinator Prof. Dr. All Departments

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016



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Course Specification For **انسانيات (حقوق الإنسان)**

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP135	Title	انسانيات (حقوق الإنسان)	Level	3 or 4	Semester	1 or 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)	2

2- Overall aims of the course

- يهدف المقرر الى اكساب الطالب المعرفة بالحقوق العامة والخاصة والواجبات بجانب التأكيد على اهمية التوازن بين الحقوق والواجبات و ربط الحقوق بالقانون وأن الواجبات هي التزام أخلاقي واجتماعي.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	يتعرف الطالب على قانون حقوق الإنسان	
	a2	يشرح الواجبات المفروضة	
	a3	يصف ماهية الحقوق الجماعية	
b- Intellectual skills: At the end of the course the student should be able to:	b1	يميز بين الحقوق والواجبات	
	b2	يفرق بين الحقوق الشخصية والحقوق الجماعية	
	b3	يحدد ضمانات وآليات حقوق الإنسان	
c-Professional and practical skills: At the end of the course the student should be able to:	c1	يفرق بين الحقوق والواجبات	
d-General and transferable skills: At the end of the course the student should be able to:	d1	يكون جماعات ويستفيد من العمل الجماعي	
4-Contents	1	التعرف بقانون حقوق الانسان وطبيعته ومصادره	
	2	أنواع الحقوق والواجبات وأمثلة	
	3	حقوق الانسان فى الاسلام	
	4	الواجبات والمسؤوليات الفئوية والمهنية	
	5	حقوق المرأة والطفل وذوى الاحتياجات الخاصة	
5- Teaching and learning method	1	محاضرات	☐
	2	مناقشات	☐
	3	طريقة المحاكاة والتشبيه	☐
6- Teaching and learning methods for students with limited capacity			Not Availiable.
7-Student Assessment Methods			
a-Using Assessment	1	امتحان نهائى	
	2	انشطة طلابية (ابحاث-ملخصات)	
	3	امتحان شفوى	



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b-Assessment Schedule	1	امتحان نهائى	15	
	2	انشطة طلابية (ابحاث-ملخصات)	طوال الفصل الدراسى	
	3	امتحان شفوى	14	
c-Weighting of Assessments	1	امتحان نهائى	45	90.00%
	2	انشطة طلابية (ابحاث-ملخصات)	2.5	5.00%
	3	امتحان شفوى	2.5	5.00%
8-List of References				
a-Course notes	1	Prepare by department staff		
b-Essential Books(text books)				
c-Suggested Books	1	حقوق الإنسان في الإسلام، عبد الله بن عبد المحسن التركي		
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course

No.	Topics	Week	Knowledge and understanding Skills	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills
1	التعرف بقانون حقوق الانسان وطبيعته ومصادره	1	a1 , a2 ,	b2 ,		
2	أنواع الحقوق والواجبات وأمثلة	2,3	a1 , a2 , a3 ,	b1 ,	c1 ,	d1 ,
3	حقوق الانسان فى الاسلام	4-7	a1 , a2 , a3 ,	b3 ,	c1 ,	d1 ,
4	الواجبات والمسؤوليات الفئويّة والمهنيّة	8-11	a1 , a2 , a3 ,	b2 , b3 ,	c1 ,	d1 ,
5	حقوق المرأة والطفل وذوى الاحتياجات الخاصة	12-14	a1 , a2 , a3 ,		c1 ,	d1 ,

Course Coordinator Prof. Dr. All department

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim



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Course Specification For English language 3

Program on which the course is given	Zoology/Chemistry
Major or minor element of programs	Minor
Department offering the program	Zoology
Department offering the course	External
Date of specification approval	10-12-2014.
Year Update	2016

1- Basic Information

Code	FP212	Title	English language 3			Level	3 or 4	Semester	1 0r 2
Lecture (h/w)	2	Practical (h/w)		Tutorial (h/w)		Credit hour (h/w)		2	

2- Overall aims of the course

1	To help Students practice and apply rules of contemporary grammar in their speech
2	To enhance Students ability to incorporate rules of grammar in their writing
3	To help Sts recognize common errors caused due to the violation in their speech and writing.

3- intended learning outcomes (ILOs)



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a- Knowledge and understanding: At the end of the course the student should be able to:	a1	Discuss the different parts of speech of the English language.
	a2	State the difference between the different types of the English sentences
b- Intellectual skills: At the end of the course the student should be able to:	b1	use the educational aids in the teaching process.
	b2	teach the English language to different people.
c-Professional and practical skills: At the end of the course the student should be able to:	c1	Apply rules of English grammar in their speech.
	c2	display their understanding of the grammatical rules of English in their writing
d-General and transferable skills: At the end of the course the student should be able to:	d1	Develop appropriate effective written and oral communication skills.
	d2	take part in the development of the schools and their relation to the outer community.
	d3	participate in the social activities held in their faculties.
4-Contents	1	Tenses
	2	Simple tenses
	3	Progressive tenses
	4	Perfect tenses
	5	Perfect progressive tenses
	6	Tag questions
	7	Self test
	8	Additions and responses with so, too, neither, either and but
	9	Gerunds and infinitives
	10	Verbs followed by objects and the base form: make, have, let, help
	11	Adverb clauses
	12	Adverbals: viewpoint, focus, and negative
	13	Revisions



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5- Teaching and learning method	1	Lectures.	☐	
	2	Homework	☐	
	3	Oral discussion	☐	
6- Teaching and learning methods for students with limited capacity			Not Availiable.	
7-Student Assessment Methods				
a-Using Assessment	1	Final exam		
	2	Mid-term exam		
	3	Oral exam		
b-Assessment Schedule	1	Final exam	15	
	2	Mid-term exam	8	
	3	Oral exam	13	
c-Weighting of Assessments	1	Final exam	45	90.00%
	2	Mid-term exam	2.5	5.00%
	3	Oral exam	2.5	5.00%
8-List of References				
a-Course notes	1	Notes on grammer		
b-Essential Books(text books)	1	English Grammar in Use		
	2	Practical English Grammar		
	3	How English works		
c-Suggested Books				
d-Scientific periodicals or Publications				

Matrix of knowledge and skills of the course



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No.	Topics	Week	Knowledge and understanding Skills	Intellec-tual Skills	Profess-ional and Practical Skills	General and Transfer-able Skills
1	Tenses	1	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
2	Simple tenses	2	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
3	Progressive tenses	3	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
4	Perfect tenses	4	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
5	Perfect progressive tenses	5	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d2 , d3 ,
6	Tag questions	6	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
7	Self test	7	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
8	Additions and responses with so, too, neither, either and but	8	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
9	Gerunds and infinitives	9	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
10	Verbs followed by objects and the base form: make, have, let, help	10,11	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
11	Adverb clauses	12	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
12	Adverbals: viewpoint, focus, and negative	13	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,
13	Revisions	14	a1 , a2 ,	b1 , b2 ,	c1 , c2 ,	d1 , d2 , d3 ,

Course Coordinator Prof. Dr. all department

Program Coordinator Prof. Dr. Ehab Moaz Abouzied

Head of department: Prof. Dr. Adel Abd Al Hakim

Date: 2016