

# **Module Handbook**

**(Courses Contents and Specifications)  
for Bachelor's degree program in**

# **Microbiology**

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### **Vision of Biology Department**

**To be pioneering and distinguished in education, research and community services.**

### **Mission of Biology Department**

**Prepare a well-qualified graduates on strong base of facts and evidences from the world of life sciences and its wide applications so they are able to serve the community and able to respond to the requirements of the labor market.**

### **Objectives of Biology Department**

- [1] Preparation of highly qualified educational and technical personnel.**
- [2] Developing and updating the curriculum in line with the modern scientific renaissance.**
- [3] To carry out outstanding scientific research that contributes to the development of science and serves the community.**
- [4] Localization of the latest scientific techniques in the fields of biology (Zoology / Botany / Microbiology).**
- [5] Encouraging talented and distinguished students.**
- [6] Encouraging academic staff members and students to participate in conferences and scientific events/activities locally and internationally.**



STUDY PLAN

FIRST YEAR			
LEVEL 1			
Course No.	Course Name	Credits	Preq.
4021101-4	GENERAL CHEMISTRY 1	4	-
601101-2	ISLAMIC CULTURE 1	2	-
7001401-4	ENGLISH LANGUAGE I	4	-
4041101-4	CALCULUS	4	-
605101-2	THE HOLY QURAN 1	2	-
Total credits		16	

LEVEL 2			
Course No.	Course Name	Credits	Preq.
4011101-4	GENERAL BIOLOGY	4	
7001402-4	ENGLISH LANGUAGE II	4	7001401-4
4031101-4	GENERAL PHYSICS	4	
501101-2	ARABIC LANGUAGE	2	
102101-2	THE BIOGRAPHY OF PROPHET MOHAMMAD (pbuh)	2	-
Total credits		16	

SECOND YEAR			
LEVEL 3			
Course No	Course Name	Credits	Preq.
4012401-4	INTRODUCTORY MICROBIOLOGY	4	4011101-4
4012161-3	BIOSTATISTICS	3	
605201-2	THE HOLY QURAN 2	2	605101-2
601201-2	ISLAMIC CULTURE 2	2	601101-2
4022301-4	ORGANIC CHEMISTRY	4	4021101-4
Total credits		15	

LEVEL 4			
Course No	Course Name	Credits	Preq
4012412-2	VIROLOGY	2	4012401-4
4012422-3	BACTERIOLOGY	3	4012401-4
4012432-3	MYCOLOGY	3	4012401-4
4012252-3	PHYCOLOGY	3	4011101-4
4012312-3	BIOCHEMISTRY	3	4022301-4
605301-2	THE HOLY QURAN 3	2	605201-2
Total credits		16	

THIRD YEAR			
LEVEL 5			
Course No	Course Name	Credits	Preq
4013421-3	ANTIMICROBIAL AGENTS	3	4012422-3 + 4012432-3
4013321-3	HAEMATOLOGY	3	4011101-4
4013431-3	WATER AND WASTEWATER MICROBIOLOGY	3	4012422-3
4013441-3	PLANT PATHOLOGY AND DISEASE CONTROL	3	4012412-2 + 4012422-3 + 4012432-3
601301-2	ISLAMIC CULTURE 3	3	601201-2
605401-2	THE HOLY QURAN 4	2	605301-2
Total credits		17	

LEVEL 6			
Course No	Course Name	Credits	Preq
4013452-3	MICROBIAL PHYSIOLOGY	3	4012401-4 + 4012312-3
4013472-3	MEDICAL MICROBIOLOGY	3	4012422-3
4013462-3	MOLECULAR MICROBIOLOGY	3	4012401-4 + 4012312-3
4013311-3	MEDICAL PARASITOLOGY	3	4012401-4
4013372-3	IMMUNOLOGY	3	4013321-3
4013953-3	RESEARCH PROJECT	3	
Total credits		18	

FOURTH YEAR			
LEVEL 7			
Course No	Course Name	Credits	Preq.
4014401-3	BIOTECHNOLOGY	3	4013462-3
4014421-3	FOOD MICROBIOLOGY	3	4012422-3 + 4013452-3
4014451-2	EPIDEMIOLOGY	2	4013472-3
4014431-3	CYANOBACTERIA	3	4012422-3
4014441-4	INDUSTRIAL MICROBIOLOGY	4	4013452-3
4014412-3	PETROLEUM MICROBIOLOGY AND BIOREMEDIATION	3	4013452-3 + 4022301-4
Total credits		18	

LEVEL 8			
Course No	Course Name	Credits	Preq
4014462-2	MICROBIAL TOXICOLOGY	2	4013472-3
4014482-2	FOOD QUALITY CONTROL	2	4014421-3
4014492-3	SOIL MICROBIOLOGY	3	4012422-3 + 4012432-3
4014472-3	ENVIRONMENTAL MICROBIOLOGY	3	4012422-3 + 4013452-3
4014182-2	BIOINFORMATICS	2	4014401-3
601401-2	ISLAMIC CULTURE 4	2	601301-2
4014953-4	PRACTICAL FIELD TRAINING	4	
Total credits		18	

# COURSES SPECIFICATION



## (A)- Introductory Courses

### (1)- General Biology 4011101-4

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>

#### A Course Identification and General Information

Course title <b>General Biology</b>
Course code: <b>4011101-4</b>
2. Credit hours: <b>4 hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
Name of faculty member responsible for the course: <b>Botany academic staff members / Zoology academic staff members.</b>
5. Level/year at which this course is offered: <b>1<sup>st</sup> Year / Level 2</b>
6. Pre-requisites for this course (if any): <b>---</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

#### B Objectives

After completing this course student should be able to: Define the principles and concepts of the living cells. Differentiate between animal and plant cells Aware of the protoplasmic and non-protoplasmic cell contents and its structure and function. 4. Study the different types of animal and plants tissues (structure and function). 5. Understand the biological activities of the living cells.
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#### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of eukaryotic cell structure and function. This course will provide a conceptual and experimental background in biology sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>Introduction:</b> - The living cells. - Basis of cytology and histology. -Major differences between Eukaryotic and Prokaryotic cells. -Major differences between plant and animal cells	<b>1</b>	<b>6</b>
<b>Plant cell morphology and structure I</b> - Cell wall, middle lamella, types of pits. - Structure and function. - Cytoplasmic ultra structure and function: Endoplasmic reticulum; mitochondria; Golgi apparatus, ribosomes	<b>1</b>	<b>6</b>

<b>Plant cell morphology and structure II</b> - Plastids, chloroplasts, chromoplast, leucoplast types, morphology, ultra structure and function, distribution. -Non protoplasmic contents of plant cell ( cell vacuole – carbohydrates – proteins – fats and oils – crystals glycosides – latex – alkaloids – tannins – organic acids).	1	6
<b>Animal cell morphology and structure I</b> -Fine structure of the Cell membrane and Cell junctions -Functions of cell membrane (cell transport) -Mitochondria, Peroxisomes, Lysosomes (phagocytosis, autocytosis and pinocytosis Centrioles, cytoskeleton, microtubules and microfilaments,	1	6
<b>Animal / Plant cell morphology and structure: The Nucleus</b> -Nucleus, nuclear envelope, nucleopores, nucleoplasm, chromatin and nucleolus. Mitochondria, Golgi apparatus and functions of each organelle.	1	6
<b>Plant morphology and anatomy</b> -Meristematic tissues in plants – classification of meristematic tissues – Apical and lateral meristems- Permanent tissues. Dermal system, ground system and vascular system. Ground system; parenchyma cell, collenchyma cell and sclerenchyma cell. Seed germination, conditions necessary for seed germination, dicotyledonous seeds and seedling 1) broad bean ( <i>Vicia faba</i> ), kidney bean ( <i>Phaseolus vulgaris</i> ), monocotyledonous seeds and seedling 1) maize ( <i>Zea mays</i> )	2	12
<b>Plant morphology</b> Morphology of the root – functions of the root, zones of the root, types of the roots, Adventitious roots	1	6
<b>Plant morphology</b> Morphology of the stem- functions of the stem- origin, functions and types of the buds- Stem branching- habit of the stem- Metamorphosis of the stem.	1	6
<b>Plant morphology</b> Morphology of the leaf- functions of the leaf- parts of the leaf- Arrangement of the leaf- types of the leaf- leaf venation- leaf metamorphosis	1	6
<b>Animal Histology I</b> -Introduction to Animal tissues difference and distribution of the animal tissues in the human body -Epithelial tissues, simple and stratified epithelia, glandular epithelia	1	6
<b>Animal Histology II</b> -Connective tissues : Types of Cartilages Types of Bones Blood components	1	6

<b>Animal Histology III</b> -Muscular tissues: -Smooth – skeletal – cardiac muscles. -Nervous tissues: -Neuron and its types - Nerve fibres - Neuroglial cells.	2	12
	14 weeks	84hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 42</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

**A brief summary of the knowledge or skill the course is intended to develop;**

**A description of the teaching strategies to be used in the course to develop that knowledge or skill;**

**The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

**Knowledge : Description of the knowledge to be acquired**

**Upon successful completion of this course The student will be able to:**

**Student will be familiar with the general characters of plant cells.**

**Student will be aware with the differences between plant and animal cells.**

**Student will be familiar with protoplasmic and non protoplasmic contents of plant cell.**

**Student will be familiar with the different types of plant tissues, their functions and distribution within plant body.**

**1- Define the difference between prokaryotic and eukaryotic cells.**

**2- Describe the fine structure and functions of all living organelles.**

**3- Explain biological activities of the animal cells.**

**4- Detect the difference between animal tissues.**

**5- Explain the function of animal tissues.**

**6- Discuss the distribution of all animal tissues in the body organs.**

**(ii) Teaching strategies to be used to develop that knowledge**

**The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.**

**At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and**

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comprehension of the course.

All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.

Using images and movies

Encouraging students to collect the new information about what the new in Microbiology

Enable the reference books and scientific sites concerning General biology in internet.

(iii) Methods of assessment of knowledge acquired:

Periodical exam and reports 10%

Mid- term theoretical exam 20%

Mid-term practical exam 5%

Final practical exam 15%

Final exam 50%

**b. Cognitive Skills**

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

explain the structure and function of the plant and animal cells.

Understand the ultrastructure and function of living organelles.

Follow some of the biological activities of the cell.

List types of plant and animal tissues.

Differentiate between plant and animal tissues.

Explain specific characters of each tissues.

Classify the plants and animal tissues

The student will be able to detect the plant and animal tissues in the selected organs examined under the microscopic.

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures

-Brain storming

-Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

- Quiz and exams

- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

At the end of the course, the student will be able to:

Describe the structure of the cell

- Explain most of the biological activities of the cell

- Make short presentation about the cell and the animal tissues.

- Defined the desirable sections.

Teaching strategies to be used to develop these skills and abilities

- Lab work

- Case Study

- Active learning
- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

Evaluate the efforts of each student in preparing the report.

Evaluate the scientific values of reports.

Evaluate the work in team

Evaluation of the role of each student in lab group assignment

Evaluation of students presentations

#### d. Communication, Information Technology and Numerical Skills

Description of the skills to be developed in this domain. At the end of the course, the student will be able to:

Enhancing the ability of students to use computers and internet.

Interpret biological data

Present biological data orally.

Know how to write a report.

Teaching strategies to be used to develop these skills

Homework (preparing a report on some topics related to the course depending on web sites).

Seminars presentation

Field visits to factories

(iii) Methods of assessment of students numerical and communication skills

Evaluation of presentations

Evaluation of reports

Practical exam

#### e. Psychomotor Skills (if applicable)

At the end of the course, the student will be able to:

Practice the basic Lab. Skills.

Use light microscope in accuracy.

Prepare microscopic slides.

(ii) Teaching strategies to be used to develop these skills

- Follow up students the students in lab and during carryout all microbiological techniques

Methods of assessment of students psychomotor skills

Giving additional marks for preparing correct media, bacterial slides , good seminar presentation

Practical exam.

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

Reece et. al (2013) Campbell Biology 10<sup>th</sup> edition. Benjamin Cummings.  
Mauseth, J. (2008) Plant Anatomy. Blackburn Press  
Wojciech Paulina (2015) Histology: a text and atlas. LWW

##### Recommended Reading List

##### Electronic Materials, Web Sites

Other learning material such as computer-based programs/CD, professional standards/regulations

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)  
Accommodation (Lecture rooms, laboratories, etc.)

Class room is already provided with data show

The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

##### 2. Computing resources

Providing class rooms with computers and labs with data show.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

Availability of some reference bacterial strains

Availability different specific media and chemicals used for isolation.

## G Course Evaluation and Improvement Processes

<b>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching Questionaries</b> <b>Open discussion in the class room at the end of the lectures</b>
<b>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department</b> <b>Revision of student answer paper by another staff member.</b> <b>Analysis the grades of students.</b>
<b>3. Processes for Improvement of Teaching</b> <b>Preparing the course as PPT.</b> <b>Using scientific movies.</b> <b>Coupling the theoretical part with laboratory part</b> <b>Periodical revision of course content.</b>
<b>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</b> <b>After the agreement of Department and Faculty administrations</b>
<b>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</b> <b>Periodical revision by Quality Assurance Units in the Department and institution</b>

Faculty member responsible for the course:

<b>Prepared by faculty staff:</b> <b>1.Botany / Zoology academic staff members.</b>	<b>Signature:</b>
<b>Date Report Completed: 1.04.2018</b>	
<b>Revised by:</b> <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	<b>Signature:</b>
<b>Date: 1.04.2018</b>	
<b>Program Chair</b> <b>Dr. Hussein H. Abulreesh.</b>	<b>Signature:</b>
<b>Dean</b>	<b>Signature:</b>
<b>Date:</b>	

## (2)- Introductory Microbiology 4012401-4

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology</b>

### A Course Identification and General Information

4. Course title <b>Introductory Microbiology</b>
5. Course code: <b>4012401-4</b>
2. Credit hours: <b>4 hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
6. Name of faculty member responsible for the course: <b>Dr. Sameer R. Organji (srorganji@uqu.edu.sa)</b>
5. Level/year at which this course is offered: <b>2<sup>nd</sup> Year / Level 3</b>
6. Pre-requisites for this course (if any): <b>General Biology (4011012-4).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

### B Objectives

After completing this course student should be able to:

4. Define the principles and concepts of Microbiology.
5. List roles the microorganisms in the nature
6. Differentiate between Eukaryotes and Prokaryotes cell structure.
4. Apply basic laboratory skills and techniques for studying microorganisms.
5. Explain the bases of diversity, structure, physiology, microbial growth, environmental effects, growth and control, and general taxonomy of microorganisms.
6. Describe the importance of microorganisms in relation to Biology and environment.
7. Evaluate students' interest in ethical aspects in the exploitation of microbial biotechnology

### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of eukaryotic and prokaryotic microbes and viruses, but will emphasize bacteria. This course will provide a conceptual and experimental background in microbiology sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ Introduction:</b> - Including historical background. - Importance of microorganisms. -Studying concepts of classification, nomenclature, and identification of microorganisms. -An overview about the role of microorganisms in the environment and their applications in different fields - Distribution of microorganisms in the environment - Different between the prokaryotes and Eukaryotes	2	6



❖ <b>Bacterial cell morphology and structure</b> - Structure, cell shape and arrangement of bacteria. - External and internal structures.	1	3
❖ <b>Eukaryotic microorganisms (Fungi and Algae)</b> - General characteristics, occurrence, diversity, economic importance, morphology, structure and function, classification, nutrition, and reproduction.	1	3
❖ <b>Viruses</b> - General characteristics, occurrence, economic importance, morphology and structure, classification, replication, and bacteriophages.	1	3
❖ <b>Introduction to metabolism of microorganisms</b> -Basic definitions, modes of nutrition of microorganisms. Nutrient requirements and concepts of energetic.	1	3
❖ <b>Factors affecting microbial activity and growth</b> Nutritional factors, temperature, pH, water activity, Oxygen requirement.	1	3
❖ <b>Microbial growth and reproduction</b> Cell growth and reproduction in microorganisms. Microbial growth curve and phases of growth. Determination of microbial growth.	1	3
❖ <b>Control of microbial activity</b> Definition, importance of control of microbial activity, physical and chemical approach of control of microbial activity.	1	3
❖ <b>Applied Microbiology</b> Application of microorganisms in soil, water, sewage, food, dairy, industrial and medical microbiology.	3	9
❖ <b>Microbes and environment</b> Alternative energy resources (Biogas), bioremediation (biodegradation of hydrocarbon, industrial and domestic wastes and pesticides). Microbes and biological control. Genetic engineering and solving food deficiency problems (Single cell protein).	2	6
	14 weeks	42hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 42</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**Practical part:**

1. Learning the equipment of a common microbiology laboratory.
2. Preparation of culture media (agar/ broth).
3. Learning the techniques of sterilization.
4. Isolation of pure culture.
5. Enumeration of microbial population.

6. Staining techniques to study morphology of microorganisms.
7. Staining technique for endospore, Gram staining.
8. Estimation of proteins.
9. Estimation of glucose.
10. Measurement of bacterial growth spectrophotometrically.
11. Isolation and cultivation of anaerobes.
12. Checking the motility of bacteria by hanging drop method.

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay)

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

#### b. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

1. Describe the importance of microorganisms in relation to biology and environment.
2. Define the principles and concepts of Microbiology.
3. Describe the growth and division of the cell.
4. List different bacterial cell morphologies.
5. Identify microbial structures from a given image.
6. Describe how the cell structure of Gram-negative and Gram-positive cells leads to a given Gram stain result.
7. Identify (model or diagram) major eukaryotic cell structures and their associated functions.
8. State unique structures present in Eukaryotes.
9. Label illustrative diagrams for key parts of microorganisms
10. Define the Scientific terms for antimicrobial activities
11. Describe factors influencing microbial growth
12. Describe the role of cyanobacteria in the oxygenation of the atmosphere.

#### (ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their

**understanding and comprehension of the course.**

- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in Microbiology
- Enable the reference books and scientific sites concerning bacteriology in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

**Having successfully completed the course students should be able to:**

1. Differentiate between prokaryotic and eukaryotic cells
2. Diagram the structure of prokaryotic and eukaryotic cells
3. Analyze requirements of microbial growth.
4. Evaluate methods of microbial control and apply proper methods.
5. Explain how microbial metabolism is important to a relevant societal issue (e.g., health and disease, agriculture, environment and biodegradation, etc.).
6. Write the positive and negative roles of microorganisms
7. Interpret how some microorganisms life well in some extreme environments
8. Explain why some Gram positive bacteria become Gram-negative stain sometimes during Gram staining.

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

**At the end of the course, the student will be able to:**

- Evaluate microbiological information.
- Analyze microbiological data.
- Judge the importance of controlling microbial growth.
- Choose representative examples for each group of microorganisms.

<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> <li>- Lab work</li> <li>- Case Study</li> <li>- Active learning</li> <li>- Small group discussion</li> </ul> <p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team</li> <li>• Evaluation of the role of each student in lab group assignment</li> <li>• Evaluation of students presentations</li> </ul>	<p>d. Communication, Information Technology and Numerical Skills</p> <p>(ii) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>6. Enhancing the ability of students to use computers and internet.</li> <li>7. Interpret microbiological data</li> <li>8. Present microbiological data orally.</li> <li>9. Know how to write a report.</li> <li>10. Teaching strategies to be used to develop these skills</li> <li>5. Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>6. Seminars presentation</li> <li>7. Field visits to factories</li> </ol> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ol style="list-style-type: none"> <li>4. Evaluation of presentations</li> <li>5. Evaluation of reports</li> <li>6. Practical exam</li> </ol>
<p>e. Psychomotor Skills (if applicable)</p> <p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Perform aseptic microbiological techniques.</li> <li>2. Preparation different media for isolation and cultivation of bacteria</li> <li>3. Perform isolation, culture, and identification techniques for studying microorganisms in a laboratory.</li> <li>4. Cultivate the bacterial isolates on the agar plate</li> <li>5. Operate selected microbiological instruments.</li> </ol>	<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>- Follow up students the students in lab and during carryout all microbiological techniques</li> </ul> <p>8. Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>• Giving additional marks for preparing correct media, bacterial slides , good seminar presentation</li> <li>• Practical exam.</li> </ul>

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

2. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

- Book note prepared by Dr. Samir Organjii
- Brock Biology of Microorganisms, Twelfth edition by Madigan, Martinko, Dunlap and Clark; Publisher: Pearson Prentice-Hall, ISBN: 0132324601 (2008).
- Benson, H.J. (2002). Microbiological Applications. Laboratory Manual in General Microbiology, eighth edition.

#### Recommended Reading List

- 1-Prescott, L., Harley, J. and Klien, D. (2005). Microbiology, MacGraw
- 2-Larry McKane & Judy Kandel (1996) Microbiology–Essential and Applications, International Edition.

#### Electronic Materials, Web Sites

(eg. Web Sites, Social Media, Blackboard, etc.)

Other learning material such as computer-based programs/CD, professional standards/regulations

PPT prepared by prof. Dr. Khaled Elbanna.

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show

- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
- 2. Computing resources
  - Providing class rooms with computers and labs with data show.
- 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - Availability of some reference bacterial strains
  - Availability different specific media and chemicals used for isolation.

#### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - Questionnaires
  - Open discussion in the class room at the end of the lectures.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - Revision of student answer paper by another staff member.
  - Analysis the grades of students.
3. Processes for Improvement of Teaching
  - Preparing the course as PPT.
  - Using scientific movies.
  - Coupling the theoretical part with laboratory part
  - Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
  - After the agreement of Department and Faculty administrations.
- 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
  - Periodical revision by Quality Assurance Units in the Department and institution.

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Sameer Organji. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

## (B)- Basic Microbiology Courses

### (1)- Virology 4012412-2



<b>Institution:</b> <a href="#">UM AL – QURA UNIVERSITY</a>
<b>College/Department :</b> <a href="#">Faculty of Applied Science –Department of Biology</a>

#### A Course Identification and General Information

<b>7. Course title</b> <a href="#">Virology</a>
<b>8. Course code:</b> <a href="#">4012412-2</a>
<b>2. Credit hours:</b> <a href="#">2hrs</a>
<b>3. Program(s) in which the course is offered. :</b> <a href="#">BSc Microbiology</a>
<b>9. Name of faculty member responsible for the course:</b> <a href="#">Prof. Gamal E. H. Osman (geosman@uqu.edu.sa)</a>
<b>5. Level/year at which this course is offered:</b> <a href="#">2<sup>nd</sup> Year / Level 4</a>
<b>6. Pre-requisites for this course (if any):</b> <a href="#">Introductory Microbiology (4012401-4).</a>
<b>7. Co-requisites for this course (if any):</b>
<b>8. Location if not on main campus:</b> <a href="#">Main campus.</a>

#### B Objectives

After completing this course student will be able to:

- [1. Review the history and principles of virology.](#)
- [2. List the general properties of viruses](#)
- [3. Write the different types of viruses](#)
- [4. Describe the basic structure of viruses.](#)
- [5. Differentiate between viruses and other microorganisms.](#)
- [6. State the characteristics used to classify viruses.](#)
- [7. List the taxonomic groups of viruses.](#)
- [8. Describe the process of viral replication and reproduction.](#)
- [9. Summarize the common plants virus diseases.](#)
- [10. Discuss the economic importance of animal and plant viruses.](#)
- [11. Describe the symptom infection by some human viruses](#)
- [12. Discuss how viruses are transmitted and the application of control measures.](#)
- [13. Summarize the different methods for isolation and purification of viruses.](#)

#### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course is designed for students in applied microbiology and general biology which covers an introduction to the field of virology and examines the important aspect and fundamentals of Virology including, virus structure, viral replication cycles, virus classification, architecture and nomenclature, laboratory diagnosis of virus, how viruses enter and spread in the host cells, host resistance to viruses and viral epidemiology.

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1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ General Virology</b> <ul style="list-style-type: none"> <li>- Brief outline on discovery of viruses</li> <li>- Nomenclature and classification of viruses</li> <li>- Distinctive properties of viruses</li> <li>- Morphology and ultra-structure</li> <li>- Capsids and their arrangements</li> <li>- Types and structures of viral envelopes.</li> <li>- Viral genome composition.</li> <li>- Virus related agents (viroids, prions, satellites).</li> </ul>	2	4
<b>❖ Bacterial Viruses</b> <ul style="list-style-type: none"> <li>-General Properties of bacterial viruses</li> <li>- Bacteriophage structural organization.</li> <li>- Life cycle.</li> <li>- Bacteriophage typing.</li> <li>- Application in bacterial genetics.</li> </ul>	3	6
<b>❖ Plant Viruses</b> <ul style="list-style-type: none"> <li>-General Properties of bacterial viruses</li> <li>- Classification and nomenclature.</li> <li>- Effects of viruses on plants; appearance of plants.</li> <li>- Histology, physiology and cytology of infected plants.</li> <li>- Common virus diseases of plants.</li> <li>- Life cycle and type species of plant viruses.</li> <li>- Prevention of crop loss due to virus infection</li> </ul>	3	6
<b>❖ Animal Viruses</b> <ul style="list-style-type: none"> <li>-General Properties of bacterial viruses</li> <li>- Classification and nomenclature of animal human viruses</li> <li>- Epidemiology, lifecycle, pathogenicity.</li> <li>- Examples of certain important viral disease</li> <li>- Viral vaccines, interferon and antiviral drugs.</li> </ul>	3	6
<b>❖ General Methods of Diagnosis of the viruses</b> <ul style="list-style-type: none"> <li>- Cultivation of viruses in embryonated eggs,</li> <li>- Experimental animals, and cell cultures</li> <li>- Serological methods</li> <li>- ELISA</li> <li>Assay of viruses</li> <li>- Infectivity assay (plaque method)</li> <li>- Infectivity assay of plant viruses.</li> <li>PCR technique for virus detection</li> </ul>	3	6
	14 weeks	26 hrs



**2 Course components (total contact hours per semester):**

<b>Lecture : 14</b>	<b>Tutorial:</b>	<b>Practical:</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay)**

**4. Development of Learning Outcomes in Domains of Learning**

**For each of the domains of learning shown below indicate:**

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**c. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course **The student** will be able to:

1. Define the virology term
2. List the economic important for the viruses
3. List the general properties of viruses
4. Describe the reproduction method of the viruses
5. Write the different types of viruses
6. Describe the basic structure of viruses.
7. Differentiate between viruses and other microorganisms.
8. State the principle used to classify viruses.
9. List the taxonomic groups of viruses.
10. Describe the process of viral replication and reproduction.
11. Summarize the symptom plant virus diseases.
12. Describe the symptom infection by some human viruses
13. Summarize the different methods for isolation and purification of viruses.

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies

- Encouraging students to collect the new information about what the new in virology
- Enable the reference books and scientific sites concerning virology in internet.

(iii) Methods of assessment of knowledge acquired:

- Periodical exam (1) (10%)
- Periodical exam (2) (10%)
- Report and activity (10%)
- Mid- term theoretical exam (20%)
- Final exam (50%)

b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1. Describe the basic structure of viruses.
2. Interpret why viruses can't life outside the hosts
3. Describe the process of viral replication.
4. Discuss how viruses are transmitted to the host.
5. Explain the different methods for isolation and purification of viruses.
6. Differentiate between viruses and other microorganisms
7. Summarize the general properties of viruses
8. Compare between the plant and animal viruses regarding the structure.
9. write the principle or the basis for classification viruses.
14. List the taxonomic groups of viruses according Baltimore.
15. Describe the process of viral replication and reproduction.
16. Summarize the common plants virus diseases.
17. Discuss the economic importance of animal and plant viruses.
18. Describe the symptom infection by some human viruses
19. Write the rapid methods used for detection of human viruses.
20. Predict from the symptoms type the virus.

(ii) Teaching strategies to be used to develop these cognitive skills:

1-Lectures

2-Brain storming

3-Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Discussions after the lecture

c. Interpersonal Skills and Responsibility

(iii) Description of the interpersonal skills and capacity to carry responsibility to be developed

At the end of the course, the student will be able to:

1. demonstrates professional attitudes and behaviors towards others.
2. Demonstrate his capability for the responsibility and Accountability

<ol style="list-style-type: none"> <li>3. show effective verbal communication with clarity.</li> <li>4. propose the smart questions</li> <li>5. understand and dissecting the problem so that it is fully solved and understood.</li> <li>6. demonstrate the assertiveness for his decision</li> </ol> <ol style="list-style-type: none"> <li>1. Teaching strategies to be used to develop these skills and abilities</li> <li>1. Open class discussions with students for minutes during lectures</li> <li>2. certain topics of the course.</li> <li>3. Case Study</li> <li>4. Active learning</li> <li>5. Small group discussion</li> </ol>
<p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team</li> <li>• Evaluation of students presentations</li> </ul>
<p>d. Communication, Information Technology and Numerical Skills</p> <p>(iii) Description of the skills to be developed in this domain.</p> <ul style="list-style-type: none"> <li>• Enhancing the ability of students to use computers and internet.</li> </ul> <p>(iv) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>• Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>• Seminars presentation</li> </ul> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> <li>• Evaluation the efforts of students in preparing the reports and referring the references.</li> </ul>
<p>e. Psychomotor Skills (if applicable)</p> <p>Description of the psychomotor skills to be developed and the level of performance required</p> <p>Upon successful completion of this course, the student is expected to be able to:</p> <ul style="list-style-type: none"> <li>- Diagram the virus structure</li> <li>-draw virus replication</li> <li>-demonstrate the symptoms of different viruses</li> </ul>
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>• Follow up the students during collection of some virus infected plants samples from the environment</li> </ul>
<p>(v) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>- Giving additional marks for the students they collect different viral infected plants from the environment.</li> </ul>

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20 %
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

3. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

- Principles of Virology: 2004. 2nd ed. S. J. Flint, et al. ASM Press.
- Plant virology 3rd edition. R.E.F., Matthews (2006).

#### Recommended Reading List

- John B. Carter, Venetia A. Saunders, (2007) Virology: principles and applications .John Wiley and Sons– 358 pages

#### Electronic Materials, Web Sites

<http://microbiology.columbia.edu/virology.html>

Other learning material such as computer-based programs/CD, professional standards/regulations

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

#### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

#### 2. Computing resources

- Providing class rooms with computers and labs with data show.

#### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of special green house for infection of plant
- Availability to visit plant farm to detect and observe Symptoms of virus infected plants

#### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3. Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Prof. Gamal E. H. Osman. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

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(2)- Bacteriology 4012422-3

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<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology</b>

**A Course Identification and General Information**

<b>10. Course title</b> <b>Bacteriology</b>
<b>11. Course code:</b> <b>4012422-3</b>
<b>2. Credit hours:</b> <b>3hrs</b>
<b>3. Program(s) in which the course is offered. :</b> <b>BSc Microbiology</b>
<b>12. Name of faculty member responsible for the course:</b> <b>Associate Prof. Dr. Khaled Elbanna</b> ( <a href="mailto:kabana@uqu.edu.sa">kabana@uqu.edu.sa</a> ) <b>Dr. Sameer R. Orgnaji</b> ( <a href="mailto:srorganji@uqu.edu.sa">srorganji@uqu.edu.sa</a> )
<b>5. Level/year at which this course is offered:</b> <b>2<sup>nd</sup> Year / Level 4</b>
<b>6. Pre-requisites for this course (if any):</b> <b>Introductory Microbiology (4012401-4).</b>
<b>7. Co-requisites for this course (if any):</b> <b>---</b>
<b>8. Location if not on main campus:</b> <b>Main campus.</b>

**B Objectives**

After completing this course student should be able to:

1. List the roles of bacteria in the life and in different applications
2. Describe the general characteristics of bacteria
3. Understand the principles and keys of bacterial taxonomy
4. Understand the positive and negative roles of bacterial in the life
2. Define basic structures and shapes of different bacterial genera.
3. Describe the fine structure of bacterial cell.
4. Differentiate between the different genera of bacteria.
5. Illustrate the bacterial growth curve.
6. Write the different methods for bacterial staining
7. summarize the factors effect on bacterial growth
8. summarize the nutritional requirements of bacteria
9. Describe the reproduction in bacteria
10. list the different animal and human diseases caused by some bacterial groups.
11. Discuss the different between gram positive and negative bacteria.
12. Describe the role of bacteria in genetic engineering and its applications in different fields.

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course deals with the occurrence of bacteria in the environment, Bacterial cell structure, classification bacterial groups based on morphological, physiological and genetic characterization. Study key characteristics, sources, and biology of many commonly encountered and/or taxonomically interesting bacterial groups. It will be considered, how molecular approaches, particularly 16S ribosomal RNA sequence analysis, allow diverse organisms to be grouped based on phylogenetic relationships. Methods and approaches for

the isolation and identification of bacteria are considered in the laboratory. Also, study of the factors effect of bacterial growth and nutrition of bacteria will be covered.

### 1 Topics to be Covered

Topic	No of Weeks	Contact hours
<b>❖ Introduction:</b> -An overview about the role of bacteria in the environment and their applications in different fields - Distribution of bacteria in the environment - Different between the prokaryotes and Eukaryotes	1	2
<b>❖ Growth of bacteria</b> - Culture and Pure Culture - Media and growth conditions for diverse bacteria	1	2
<b>❖ Bacterial taxonomy</b> - Bergey's Manual of determinative Bacteriology -Bergey's Manual of Systematic Bacteriology - Nomenclature of bacteria - Identification - Classification - Morphological characteristics - Phenotypic of bacteria - Genotypic of bacteria (16s rRNA, DNA-DNA hybridization, Fatty acids frofile, Protein profile)	1	2
<b>❖ Bacterial motility</b> - Swimming by flagella - Gliding movement - Rotary movement	3	6
<b>❖ Bacterial staining</b> - Simple Stains:(positive stain and negative stain) - Compound or differential stains: Gram stain Spore stain Acid fast stain	2	4
<b>❖ Bacterial cell structure and the their functions</b> - Cell wall - Protoplast - Cytoplasmic membrane - Cytoplasmic contents: -Bacterial genome and plasmids - Stored materials - Gas Vacuoles -Spores (in some cases), Sporulation in bacteria	1	2

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❖ <b>Bacterial reproduction</b> -Reproduction methods in bacteria - Bacterial growth curve - Factors effect the growth curve of bacteria - Generation time	2	4
❖ <b>Bacterial Nutrition</b> -Energy resources for bacteria -Heterotrophic bacteria, Autotrophic bacteria - Oxygen, light, elements, vitamins requirements	1	2
❖ <b>Short Description for:</b> - Microorganisms in Soil - Microorganisms in Food and dairy -Microorganisms in water	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
12h (reports & essay)

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**d. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course The student will be able to:

1. List the roles of bacteria in the life and in different applications
2. Describe the general characteristics of bacteria
3. Understand the principles and keys of bacterial taxonomy
4. Understand the positive and negative roles of bacterial in the life
2. Define basic structures and shapes of different bacterial genera.
3. Describe the fine structure of bacterial cell.
4. Differentiate between the different genera of bacteria.
5. Illustrate the bacterial growth curve.
6. Write the different methods for bacterial staining
7. summarize the factors effect on bacterial growth



8. summarize the nutritional requirements of bacteria
9. Describe the reproduction in bacteria
10. list the different animal and human diseases caused by some bacterial groups.
11. Discuss the different between gram positive and negative bacteria.
12. Describe the role of bacteria in genetic engineering and its applications in different fields.

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new bacteriology
- Enable the reference books and scientific sites concerning bacteriology in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam (s) 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 10%
- Report and activity 5%
- Final practical exam 15%
- Final exam 40%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

1. Describe the general characteristics of bacteria
2. Understand the principles and keys of bacterial taxonomy
3. Understand the positive and negative roles of bacterial in the life
3. Describe the fine structure of bacterial cell.
4. Differentiate between the different genera of bacteria.
7. summarize the factors effect on bacterial growth
8. summarize the nutritional requirements of bacteria
9. Describe the reproduction in bacteria
11. Discuss the different between gram positive and negative bacteria.
12. Describe the role of bacteria in genetic engineering and its applications in different fields.

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
- Brain storming
- Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

### **Interpersonal Skills and Responsibility**

#### **List Of Interpersonal Skills: 10 Must-Have Attributes:**

##### **1. Verbal Communication**

- Effective verbal communication begins with clarity

##### **2. Non-verbal Communication:**

Non-verbal communication is something that other people notice whether you are aware of your actions or not.

3. Listening, Questioning is a great way to initiate a conversation. It demonstrates interest and can instantaneously draw someone into your desire to listen.

4. Questioning: is a great way to initiate a conversation. It demonstrates interest and can instantaneously draw someone into your desire to listen. Smart questions show that you know how to approach problems and how to get the answers you need.

5. Good manners: tend to make many other interpersonal skills come naturally.

6. Problem solving :The key aspects of successful problem solving are being able to identify exactly what the problem is, dissecting the problem so that it is fully understood.

7. Social Awareness: Being in tune to others' emotions is an essential interpersonal skill. This dictates how many of your other interpersonal skills should function.

8. Self-management: allows us to control our emotions when they are not aligned with what would be considered appropriate behavior for a given situation.

##### **9. Responsibility and Accountability:**

Responsibility and accountability are two reliable indicators of maturity.

##### **10. Assertiveness:**

Being assertive is the only way to get your ideas onto a competitive table.

Description of the interpersonal skills and capacity to carry responsibility to be developed .

At the end of this course, the student will be able to:

- demonstrate professional attitudes and behaviors towards others.
- Demonstrate his capability for the responsibility and Accountability
- show Effective verbal communication with clarity.
- propose smart questions
- understand and dissecting the problem so that it is fully solved and understood
- demonstrate the assertiveness for his decision
- (iv) Teaching strategies to be used to develop these skills and abilities
  - Open class discussions with students for minutes during lectures and labs.
  - Students (as groups and individuals) should give reports concerning certain topics of the course.
- (iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility
  - Evaluate the efforts of each student in preparing the report.
  - Evaluate the scientific values of reports.
  - Evaluate the work in team

**d. Communication, Information Technology and Numerical Skills**

- (vi) Description of the skills to be developed in this domain.
  - Enhancing the ability of students to use computers and internet.
- (vii) Teaching strategies to be used to develop these skills
  - Homework (preparing a report on some topics related to the course depending on web sites).
  - Seminars presentation
  - Field visits to factories
- (iii) Methods of assessment of students numerical and communication skills
  - Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

Description of the psychomotor skills to be developed and the level of performance required

Upon successful completion of this course, the student is expected to be able to:

1. perform the laboratory experiments precisely
2. operate all devices in lab
3. Diagram growth curve of bacteria.
4. assemble and collect important bacterial isolates
5. Prepare different media
6. Cultivate the bacterial isolates
7. Carry out bacterial identification techniques.

- (ii) Teaching strategies to be used to develop these skills  
- Follow up students during preparing different media , isolation and cultivation of bacteria, carry out the laboratory experiments
- (viii) Methods of assessment of students psychomotor skills  
• Giving additional marks for preparing correct media, bacterial slides , good seminar presentation

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

4. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

- Book note prepared by associate prof. Dr. Khaled El Banna
- Brock Biology of Microorganisms, Twelfth edition by Madigan, Martinko, Dunlap and Clark; Publisher: Pearson Prentice-Hall, ISBN: 0132324601 (2008).
- Benson, H.J. (2002). Microbiological Applications. Laboratory Manual in General Microbiology, eighth edition.

##### Recommended Reading List

- 1-Prescott, L., Harley, J. and Klien, D. (2005). Microbiology, MacGraw
- 2-Larry McKane & Judy Kandel (1996) Microbiology–Essential and Applications, International Edition.

##### Electronic Materials, Web Sites

[www.bacteriamuseum.org/niches/wabacteria/bacteriology.shtml](http://www.bacteriamuseum.org/niches/wabacteria/bacteriology.shtml)<http://www.bacterio.net>

Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by Associate prof. Dr. Khaled Elbanna.

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

### 2. Computing resources

- Providing class rooms with computers and labs with data show.

### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability different specific media and chemicals used for isolation.

## G Course Evaluation and Improvement Processes

### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures

### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations.

### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution.

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Hussein Hassan Abulreesh. 2. Dr. Khaled Elbanna. 3. Dr. Sameer Organji.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

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### (3)- Mycology 4012432-3

<b>Institution:</b> UMM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology
<b>A Course Identification and General Information</b>
1. Course title and code: <b>Mycology 4012432-3</b>
2. Credit hours: <b>3hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
4. Name of faculty member responsible for the course: <b>Prof. Ahmed Yehya Abdel-Mallek Mahmoud (ayahmed@uqu.edu.sa)</b>
5. Level/year at which this course is offered: <b>2<sup>nd</sup> Year / Level 4</b>
6. Pre-requisites for this course (if any): <b>Introductory Microbiology 4012401-4</b>
7. Co-requisites for this course (if any): <b>-</b>
8. Location if not on main campus: <b>Main campus.</b>

#### B Objectives

- ❖ After completing this course student should be able to:
  - identify the distribution of fungi in nature.
  - list the positive and the negative roles of fungi in life.
  - discuss the systematic classification of fungi.
  - describe the general characters of fungi.
  - recognize the characteristics of myxomycetes and their important genera.
  - list the different divisions related to Eumycota.
  - describe Mastigomycotina and some related genera .
  - compare between some genera related to Zygomycotina
  - list the way of classification of Ascomycotina
  - state the economic importance of ascomycetous fungi such as Saccharomyces, Aspergillus, Penicillium.
  - summarize the way of classification of Basidiomycetes and some resembling genera
  - discuss the life cycles of rust and smut fungi
  - summarize the characters and classification of Deuteromycotina
  - label some of resembling genera in Deuteromycotina

#### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

The course of Mycology is designed to identify the students of microbiology the general characters of fungi, their distribution in nature and their positive and negative roles in life. Also, the course will show the students how they can classify fungi into 5 sub divisions and genera included in each. Students will follow up life cycles in some famous genera resembling all sub divisions.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>Introduction:</b> - what are fungi – distribution of fungi in nature – the positive role of fungi in life (food industry – medicinal industry – industrial microbiology – biocontrol – soil fertility)	1	2
<b>General characters of fungi:</b> - the negative role of fungi in life (food deterioration – human, animal and plant diseases) - fungal nutrition – spore formation in fungi (asexual and sexual spores) –	1	2
<b>Fungal classification:</b> - Myxomycotina (their general characteristics) - study of some resembling fungi ( <i>Arcyria</i> , <i>Physarum</i> , <i>Stemonitis</i> , <i>Plasmodiophora</i> )	1	2
- Fungal classification (continued): - Mastigomycotina - general characteristics - study of some resembling fungi ( <i>Synchytrium</i> , <i>Allomyces</i> , <i>Saprolegnia</i> )	1	2
- Fungal classification (continued): - Mastigomycotina - <i>Pythium</i> , <i>Phytophthora</i> , downy mildews fungi, <i>Albugo</i>	1	2
- Fungal classification (continued): - Zygomycotina - general characteristics - Formation of zygospore - study of some resembling fungi ( <i>Rhizopus</i> , <i>Mucor</i> , <i>Phycomyces</i> )	1	2
- Fungal classification (continued): - Zygomycotina - <i>Pilobolus</i> , <i>Mortierella</i> , <i>Thamnidium</i> , <i>Syncephalastrum</i> , <i>Cunninghamella</i> , <i>Entomophthora</i> .	1	2
- Fungal classification (continued): - Ascomycotina - general characteristics - Types of fruiting bodies - study of some resembling fungi ( <i>Saccharomyces</i> , <i>Schizosaccharomyces</i> , <i>Taphrina</i> )	1	2
- Fungal classification (continued): - Ascomycotina (continued) - study of some resembling fungi - <i>Aspergillus</i> , <i>Penicillium</i> and their economic importance.	1	2



- Fungal classification (continued): - Ascomycotina (continued) – powdery mildews fungi. - <i>Sordaria</i> , <i>Claviceps</i> , medicinal importance of ergot - <i>Peziza</i> , <i>Morchella</i> , <i>Terfezia</i> .	1	2
- Fungal classification (continued): - Basidiomycotina - general characteristics - Rust fungi	1	2
- Fungal classification (continued): - Basidiomycotina(continued) - Smut fungi - <i>Agaricus</i> , <i>Amanita</i> , <i>Coprinus</i> , <i>Lycoperdon</i> , <i>Hydnum</i> , <i>Clavaria</i> , <i>Phallus</i> , <i>Geastrum</i>	1	2
- Fungal classification (continued): - Deuteromycotina - general characteristics - Classification of Deuteromycotina - <i>Candida</i> and their medicinal importance	1	2
- Fungal classification (continued): - Deuteromycotina (continued) - Studying some resembling genera: <i>Botrytis</i> , <i>Trichoderma</i> , <i>Microsporum</i> , <i>Alternaria</i> , <i>Fusarium</i> , <i>Graphium</i> , <i>Rhizoctonia</i>	1	2
	14 weeks	28 hours

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay)**

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**a. Knowledge**

**Upon successful completion of this course The student will be able to:**

- 1- identify the distribution of fungi in nature.
- 2- list the positive and the negative roles of fungi in life.

<ul style="list-style-type: none"> <li>3- discuss the systematic classification of fungi.</li> <li>4- describe the general characters of fungi.</li> <li>5- recognize the characteristics of myxomycetes and their important genera.</li> <li>6- list the different divisions related to Eumycota.</li> <li>7- describe Mastigomycotina and some related genera .</li> <li>8- compare between some genera related to Zygomycotina</li> <li>9- list the way of classification of Ascomycotina</li> <li>10- state the economic importance of ascomycetous fungi such as Saccharomyces, Aspergillus, Penicillium.</li> <li>11- summarize the way of classification of Basidiomycetes and some resembling genera</li> <li>12- discuss the life cycles of rust and smut fungi</li> <li>13- summarize the characters and classification of Deuteromycotina</li> <li>14- label some of resembling genera in Deuteromycotina</li> </ul>
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> <li>1- Lectures which must start with preliminary one showing course contents</li> <li>2- Using images and movies</li> <li>3- Encouraging student to isolate fungi from different localities and habitat.</li> <li>4- Enable the reference books and scientific sites concerning fungi in internet.</li> <li>5- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions</li> </ul>
<p>(iii) Methods of assessment of knowledge acquired:</p> <ul style="list-style-type: none"> <li>1. Periodical exam (s) 10%</li> <li>2. Mid- term theoretical exam 20%</li> <li>3. Mid-term practical exam 10%</li> <li>4. Report and activity 5%</li> <li>5. Final practical exam 15%</li> <li>6. Final exam 40%</li> </ul>
<p>b. Cognitive Skills</p>
<p>(i) Cognitive skills to be developed</p> <p>Having successfully completed the course students should be able to:</p> <ul style="list-style-type: none"> <li>1- summarize the characteristic features of fungi</li> <li>2- compare between myxomycota and eumycota.</li> <li>3- diagram some fungal genera within myxomycota</li> <li>4- list the general characters of mastigomycotina.</li> <li>5- describe the ways of asexual and sexual reproduction in zygomycotina</li> <li>6- list the characteristic features of ascomycotina and their classification</li> <li>7- differentiate between famous genera within ascomycetes.</li> <li>8- write economic importance of Aspergillus and Penicillium</li> <li>9- subdivide the different classes in basidiomycetes</li> <li>10- diagram the studied basidiomycetes genera</li> <li>11- summarize the characters of deuteromycotina</li> <li>12- compare between studied genera within deuteromycotina</li> </ul>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> <li>1- Giving examples both in lectures and labs and sharing students in microscopical examination and description.</li> <li>2- Practical isolation of fungi from different habitats in lab and making</li> </ul>

<b>discussion with students how they can detect their systematic classification depending on their morphological and microscopical characters</b>	
(iii) Methods of assessment of students cognitive skills	<ul style="list-style-type: none"> <li>• <b>Exam must contain questions that can measure these skills(see copies of exams)</b></li> <li>• <b>Oral discussion in lectures and labs</b></li> </ul>
<b>c. Interpersonal Skills and Responsibility</b>	
(v) Description of the interpersonal skills and capacity to carry responsibility to be developed	<p><b>At the end of the course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li><b>1- obtain knowledge by himself from different sources</b></li> <li><b>2- choose the different media that can be used in isolation and identification</b></li> <li><b>3- Demonstrate professional attitudes and behaviors towards others.</b></li> </ol>
(vi) Teaching strategies to be used to develop these skills and abilities	<ol style="list-style-type: none"> <li><b>1- Open class discussions with students for minutes during lectures and labs.</b></li> <li><b>2- Students (as groups and individuals) should give reports concerning certain topics of the course.</b></li> </ol>
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility	<ol style="list-style-type: none"> <li><b>1- Evaluate the efforts of each student in preparing the report.</b></li> <li><b>2- Evaluate the scientific values of reports</b></li> <li><b>3- Evaluation of the role of each student in lab group assignment</b></li> </ol>
<b>d. Communication, Information Technology and Numerical Skills</b>	
(ix) Description of the skills to be developed in this domain.	<ol style="list-style-type: none"> <li><b>1- Enhancing the ability of students to use computers and internet.</b></li> <li><b>2- Follow-up the students to show them how they can prepare reports</b></li> </ol>
(x) Teaching strategies to be used to develop these skills	<ol style="list-style-type: none"> <li><b>1- Homework (preparing a report on some topics related to the course depending on web sites).</b></li> <li><b>2- Seminars presentation</b></li> <li><b>3- Practical during carryout the experiments in the lab.</b></li> </ol>
(iii) Methods of assessment of students numerical and communication skills	<ol style="list-style-type: none"> <li><b>1- Evaluation of presentations</b></li> <li><b>2- Evaluation of reports</b></li> <li><b>3- Practical exam.</b></li> </ol>
<b>e. Psychomotor Skills (if applicable)</b>	
<p><b>Description of the psychomotor skills to be developed and the level of performance required</b></p> <p><b>At the end of the course the students should be able to:</b></p> <ol style="list-style-type: none"> <li><b>1- prepare of student skills to use microscope</b></li> <li><b>2- Enhancement of student ability to use light microscope in accuracy.</b></li> <li><b>3- Prepare culture media, the ways of isolation and purification of fungi cultures.</b></li> </ol>	
(ii) Teaching strategies to be used to develop these skills	<p><b>Follow up students during preparing slides, media, examination and isolation of fungi.</b></p>

- (xi) Methods of assessment of students psychomotor skills  
**1- Giving additional marks for the students they have accurate laboratory results and good seminar presentation**  
**2- Practical exam.**

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

5. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

**Office hours: 10hrs.**

#### E Learning Resources

##### Required Text(s):

- **Course note prepared by faculty member responsible for the course: Prof. Dr. Ahmed Yehya Abdel-Mallek**

##### 6. Essential References

- **Principles of Mycology(2005). Abdallah Naser AlRahma**
- **Fungi (2002). Abdel Aziz Kablan, Idris Monir Turkey, Mohamed Mohamed Alhoseny .**

##### 3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

##### 4- Electronic Materials, Web Sites etc

- <http://www.mycolog.com/fifthtoc.html>
- <http://www.biolib.cz/en/gallery/dir22/>
- <http://en.wikipedia.org/wiki/Fungi>

##### 5- Other learning material such as computer-based programs/CD, professional standards/regulations

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- **Class room is already provided with data show**
- **The area of class room is suitable concerning the number of enrolled students and air conditioned.**

##### 2. Computing resources

- **Providing class rooms with computers.**

##### 7. Other resources (specify --e.g. If specific laboratory equipment is required, list requirements or attach list)

- **Providing the lab with prepared slides**

- Availability new light microscopes

## G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Class room discussion</li> </ul>
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3 Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: <b>Prof. Dr. Ahmed Yehya Abdel-Mallek</b>	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Head of Program <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(4)- Phycology 4012252-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>

**A Course Identification and General Information**

13. Course title <b>Phycology and its Applications</b>
14. Course code: <b>4012252-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
15. Name of faculty member responsible for the course: <b>Prof. Ali Gab-Alla</b>
5. Level/year at which this course is offered: <b>2<sup>nd</sup> Year / Level 4</b>
6. Pre-requisites for this course (if any): <b>General Biology (4011012-4).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

After completing this course student should be able to:

- 1- To study of the different algal groups in fresh and marine waters, their description, identification and taxonomy, biology including life cycle, and ecology.
- 2- To be familiar with the ecological and economic importance of algae.
- 3- Commercial use of algae.

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

The course will cover the description of all algal groups, both fresh water and marine algal species. The topics to be covered include: algal classification, environmental distribution, life cycles. Also economic and environmental of different algal species and their commercial use will be discussed.

<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
❖ <b>Introduction to Phycology:</b> <b>Importance of their study – Habitats – structure of algal cells, algal forms, general notes about reproduction – Classification</b>	<b>2</b>	<b>4</b>
❖ <b>Economic Importance of Algae</b> <b>The commercial use of algae and its products</b>	<b>1</b>	<b>2</b>
❖ <b>Division: Chlorophyta</b> <b>general characters – systematic characteristics of classes, orders and families with examples of most dominant genera, including their habits, habitats, structure and life cycle.</b>	<b>4</b>	<b>8</b>

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❖ <b>Division: Euglenophyta</b> general characters – systematic characteristics of classes, orders and families with examples of most dominant genera, including their habits, habitats, structure and life cycle.	1	2
❖ <b>Division: Chromophyta</b> general characters – systematic characteristics of classes, orders and families with examples of most dominant genera, including their habits, habitats, structure and life cycle.	4	8
❖ <b>Division: Rhodophyta</b> general characters – systematic characteristics of classes, orders and families with examples of most dominant genera, including their habits, habitats, structure and life cycle.	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**e. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course The student will be able to:

- 1- Build up knowledge about economic importance of algae
- 2- Build up knowledge about identification of different groups and genera of algae of the local habitats
- 3- Build up knowledge about the biology and ecology of different groups and their genera (the most common genera).

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important algae in different applications and human service.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in biochemistry
- Enable the reference books and scientific sites concerning phycology in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

- 1- Skill of collecting algae
- 2- Skill of preserving algae
- 3- Skill of description of algae
- 4- Skill of identification of algae
- 5- Skill of describing, measuring, evaluating the different environments of different algal species

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

At the end of the course, the student will be able to:

- Evaluate information.
- Perform statistical test and analyse statistical data.
- Judge the importance of biostatistics.



<p>(vii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> <li>- Lab work</li> <li>- Case Study</li> <li>- Active learning</li> <li>- Small group discussion</li> </ul> <p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team</li> <li>• Evaluation of the role of each student in lab group assignment</li> <li>• Evaluation of students presentations</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p> <p>(xii) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>11. Enhancing the ability of students to use computers and internet.</li> <li>12. Interpret biostatistics data</li> <li>13. Present biochemical data.</li> <li>14. Know how to write a report.</li> <li>15. Teaching strategies to be used to develop these skills</li> <li>9. Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>10. Seminars presentation</li> <li>11. Field trips</li> </ol> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ol style="list-style-type: none"> <li>7. Evaluation of presentations</li> <li>8. Evaluation of reports</li> <li>9. Practical exam</li> </ol>
<p><b>e. Psychomotor Skills (if applicable)</b></p> <p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1- Ability of using laboratory equipment.</li> <li>2- Ability of using microscope</li> <li>3- Ability of drawing samples</li> <li>4- Ability to identification of algae</li> <li>5- Ability to describing, measuring, evaluating the different environments of different algal species</li> </ol>
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>- Follow up students the students in lab and during carryout all computer excersizes</li> </ul>
<p>12. Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>• Homework</li> <li>• Practical exam.</li> </ul>

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

8. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

- Algae (2000). Abdel Aziz Kablan, Idris Monir Turkey, Mohamed Mohamed Alhoseny (Eds.). Abo-Azzma Books Library.
- The Algae (1973). V. J. Chapman, D. J. Chapman (Eds.). Macmillan and Co LTD.

#### Recommended Reading List

Electronic Materials, Web Sites  
(eg. Web Sites, Social Media, Blackboard, etc.)

Other learning material such as computer-based programs/CD, professional standards/regulations

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - Class room is already provided with data show
  - The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
2. Computing resources
  - Providing class rooms with computers and labs with data show.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  -

## G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3. Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Prof. Ali Gab-Alla. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

## (5)- Medical Parasitology 4013311-3

<b>Institution:</b> UMM AL-QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science - Department of Biology
<b>A Course Identification and General Information</b>
1. Course title and code: Medical Parasitology 4013311-3
2. Credit hours: 3 hrs
3. Program(s) in which the course is offered. BSc Microbiology
4. Name of faculty member responsible for the course: Dr. Osama M. Sarhan
5. Level/year at which this course is offered: 3 <sup>rd</sup> Year / Level 6
6. Pre-requisites for this course (if any): General Biology (4012401-4)
7. Co-requisites for this course (if any):
8. Location if not on main campus: Main Campus.

### B Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <p><b>Intended Learning Outcome is to know</b></p> <ul style="list-style-type: none"> <li>❖ Parasitology, parasitism, parasite groups.</li> <li>❖ Relations between parasites and their hosts.</li> <li>❖ Types of parasitism (ectoparasites, endoparasites).</li> <li>❖ Types of hosts (definitive, intermediate and reservoir hosts).</li> <li>❖ Scientific classification of ecto and endoparasites.</li> <li>❖ Diagnostic, infective, nutritive and cystic stages.</li> <li>❖ Life cycles of parasites</li> <li>❖ Prevention, diagnosis, and epidemiology of different parasitic diseases.</li> <li>❖ Natural and acquired immunity against parasites.</li> <li>❖ Study unicellular parasites (sarcomastigophora, ciliophora, sporozoa).</li> <li>❖ Study flatworms parasites (Phylum Platyhelminthes)</li> <li>❖ Study roundworms parasites (Phylum Nematoda).</li> <li>❖ Study acanthocephalus worms (Phylum Acanthocephala).</li> <li>❖ Study tongueworms (Pentastomatidae).</li> </ul>
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <p><b>To continuous improvement of the present course:</b></p> <ul style="list-style-type: none"> <li>❖ By gaining different preserved parasites.</li> <li>❖ Reserved access to samples of parasitic worms</li> <li>❖ Access to microscopic parasitic stages especially unicellular parasites and infective stages of worms</li> <li>❖ The completion of the shortcomings of the parasitic samples and their diagnostic and infective stages.</li> <li>❖ Students should be discussing the relations between the host and the parasites.</li> <li>❖ Students should be discuss the life cycles of parasites</li> <li>❖ Students should be suggest mechanisms to prevent infection and to increase health awareness</li> </ul>

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**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topic	Weeks	Total Contact (actual) hours/week
<b>Introduction to parasitology</b> <b>Definition of parasitism, selective parasitism, obligatory parasitism.</b> <b>Types of hosts</b> <b>Habitats of parasites</b> <b>Unicellular parasites</b> <b>Practical lesson</b> <b>Sarcodina, Brain eating amoeba, <i>Naegleria fowleri</i>, life cycle</b> <b>Sarcodina, <i>acanthamoeba encephalitis</i>, life cycle</b>	1 <sup>st</sup>	5
<b>Intestinal parasites</b> <b>Sarcodina, entamoeba, life cycle</b> <b>Practical lesson</b> <b><i>Entamoeba histolytica</i>, <i>E coli</i></b>	2 <sup>nd</sup>	5
<b>Intestinal flagellates</b> <b><i>Giardia</i>, life cycle</b> <b>Practical lesson</b> <b><i>Giardia lamblia</i>, <i>E coli</i></b>	3 <sup>rd</sup>	5
<b>Intestinal ciliates</b> <b><i>Blantidium coli</i>, life cycle</b> <b>First periodical test (periodical exam).</b> <b>Practical lesson</b> <b><i>Blantidium coli</i></b>	4 <sup>th</sup>	5
<b>Parasitic sporozoa</b> <b>Systematic classification of sporozoa</b> <b><i>Toxoplasma gondii</i>, life cycle</b> <b>Practical lesson:</b> <b><i>Toxoplasma gondii</i>,</b> <b><i>Plasmodium malariae</i>, <i>Plasmodium falciparum</i>, <i>Plasmodium ovale</i></b>	5 <sup>th</sup>	5
<b>Blood parasites</b> <b>Blood flagellates, life cycle</b> <b><i>Trypanosoma gambiense</i>, <i>Trypanosoma rodesiense</i>,</b> <b><i>Trypanosoma lewisi</i>,</b> <b>Practical lesson:</b> <b><i>Trypanosoma gambiense</i>, <i>Trypanosoma rodesiense</i>,</b> <b><i>Trypanosoma lewisi</i>,</b>	6 <sup>th</sup>	5
<b>Blood parasites</b> <b>Blood flagellates, <i>Leishmania</i>, life cycle</b> <b>Practical lesson:</b> <b><i>Leishmania</i>,</b>	7 <sup>th</sup>	
<b>Midterm exam:</b> <b>Written exam</b> <b>Practical exam</b>	8 <sup>th</sup>	5
<b>Urogenital flagellates</b> <b><i>Trichomonas vaginalis</i></b> <b>Practical lesson:</b> <b><i>Trichomonas vaginalis</i></b>	9 <sup>th</sup>	5
<b>Platyhelmenthes</b> <b>liver worms</b> <b><i>Fasciola hepatica</i>, <i>Fasciola gigantica</i>, life cycle</b>		5

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<b>Practical lesson:</b> W.M, <i>Fasciola hepatica</i> , <i>Fasciola gigantica</i> , TS of <i>Fasciola</i> <i>Cercaria</i> of <i>Fasciola hepatica</i> , <i>Fasciola gigantica</i>		
<b>Platyhelmenthes</b> liver worms <i>Schistosoma mansoni</i> , <i>Schistosoma haematobium</i> , life cycle <b>Practical lesson:</b> W.M, male and female <i>Schistosoma mansoni</i> , and W.M, male and female <i>S. haematobium</i> , Egg, miracidia, redia and cercaria stages of <i>Schistosoma mansoni</i> , Egg, miracidia, redia and cercaria stages of <i>S. haematobium</i> ,	10 <sup>th</sup>	5
<b>Platyhelmenthes</b> Intestinal worms (cestods) <i>Tania saginata</i> , <i>Tania solium</i> , life cycle <b>Practical lesson:</b> Preserved <i>Tania</i> sp. W.M, scolex of <i>Tania saginata</i> , TS of <i>Tania</i> scolex of <i>Tania solium</i> , W.M. of immature, mature and Gravid proglottis	11 <sup>th</sup>	5
<b>Nematods</b> Intestinal roundworms <i>Ascaris</i> sp. , life cycle <b>Practical lesson:</b> Preserved ascaris sp. TS of male of <i>Ascaris</i> TS of Female of <i>Ascaris</i>	12 <sup>th</sup>	5
<b>Nematods</b> Intestinal roundworms <i>Ancylostoma caninum</i> , <i>Ancylostoma duodenale</i> , life cycle <b>Practical lesson:</b> Preserved <i>Ancylostoma caninum</i> , and <i>Ancylostoma duodenale</i> TS of <i>Ancylostoma</i>	13 <sup>th</sup>	5
<b>Phylum Acanthocephala</b> thorny-headed worms, or spiny-headed worms, life cycle <b>Practical lesson:</b> Preserved spiny-headed worms TS of or spiny-headed worms	14 <sup>th</sup>	5
<b>Phylum Pentastomatidae</b> <i>Linguatula serrata</i> , Visceral pentastomiasis in humans, life cycle <b>Practical lesson:</b> Adult male and female <i>Linguatula serrata</i>	15 <sup>th</sup>	
<b>Written Final exam</b>	16 <sup>th</sup>	
<b>Total weeks / total actual contact hours</b>	<b>16 W</b>	<b>64</b>

**2 Course components (total contact hours per semester):**

<b>Lecture: 32 hours</b>	<b>Tutorial:</b>	<b>Practical/Fieldwork/ Internship: 80 hours</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)**

**1 hour/week**

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop
- A description of the teaching strategies to be used in the course to develop that knowledge or skill
- The methods of student assessment to be used in the course include:
- Open discussion,
- Activities,
- Periodical quiz test,
- Midterm and final exams are used to evaluate learning outcomes in the domain concerned.

##### a. Knowledge

##### (i) Description of the knowledge to be acquired

By the end of the course the student should be able to:

- 1- Define the process of embryonic development in general.
- 2- Describe the major phenomenon of development, growth and differentiation.
- 2- Explain the process of fertilization.
- 3- Comparison the events of cleavage, blastulation and gastrulation in selected chordate embryos.
- 4- Understand the formation of some selected organs created by ectoderm, endoderm and mesoderm.
- 5- Study the extra-embryonic membranes and their role in the formation of placenta.
- 6- Know the multiple birth and formation of twins.
- 7- Gain the scientific terms of embryology which allow the students how to deal with internet, text books and references.
- 8-Observe the serial embryonic stages in some selected chordate.
- 9- Develop the practical drawings.

##### (ii) Teaching strategies to be used to develop that knowledge

- Lectures
- Take home assignment
- Internet activities
- Laboratory work.

##### (iii) Methods of assessment of knowledge acquired

- Periodical exam and reports 10%.
- Mid- term exam 20%.
- Mid-term practical exam 10%.
- Student activities (Reports and essay...) 5%
- Final practical exam 15%.
- Final exam 40%.

##### b. Cognitive Skills:

<p>(i) Cognitive skills to be developed</p> <p><b>At the end of the course the student will develop the ability to:</b></p> <ul style="list-style-type: none"> <li>- Follow the stages of Gametogenesis.</li> <li>- Know the formation of yolk and its role in the formation of ova.</li> <li>- Classify the different types of uterus.</li> <li>- Understand the acrosomal reaction during fertilization.</li> <li>- Follow the cellular movements during gastrulation in selected embryos (amphioxus, frog, chick and mammals).</li> <li>- Detect the differentiation of mesoderm.</li> <li>- Summarized List types of animal tissues.</li> <li>- Differentiate be the heart formation and blood circulation.</li> <li>- Notify the embryonic and maternal parries involved in placentation.</li> <li>- Understand the embryonic sections (cross ans sagettal sections) and models.</li> </ul>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> <li>- Seminars.</li> <li>- Self assessment.</li> <li>- Discussion.</li> <li>- Examination of selected micrographs and hand drawings.</li> <li>- Microscopic Examination.</li> </ul>
<p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> <li>- Discussion.</li> <li>- Research work.</li> <li>- Multiple choice exams.</li> <li>- Practical evaluation.</li> <li>- Microscopic exam evaluation.</li> </ul>
<p><b>c. Interpersonal Skills and Responsibility</b></p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> <li>• Student should be able to obtain knowledge about animal embryology.</li> <li>• Defined the desirable sections.</li> <li>• Encouraging the student to work in a team.</li> </ul>
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> <li>• Open class discussions with students for minutes during lectures and labs.</li> <li>• Students (as groups and individuals) should give reports concerning certain topics of the course.</li> </ul>
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>- Self test.</li> <li>- Practical test.</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p>



(i) Description of the skills to be developed in this domain.
<ul style="list-style-type: none"> <li>Enhancing the ability of students to use computers and internet.</li> </ul> <p>By the end of this course the student should have developed the skill to:</p> <ul style="list-style-type: none"> <li>Search the internet.</li> <li>Design a professional presentation.</li> </ul>
(ii) Teaching strategies to be used to develop these skills
<ul style="list-style-type: none"> <li><u>Homework (preparing a report on some topics related to the course depending on web sites).</u></li> <li>Demonstrative lectures</li> <li>Using Diagrams, animations from web sites.</li> <li>Open Discussion.</li> </ul>
(iii) Methods of assessment of students numerical and communication skills
<ul style="list-style-type: none"> <li><u>Oral presentation.</u></li> <li><u>Assessment of presentations</u></li> </ul>
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required
<p><u>At the end of the course the student have gained psychomotor skills to:</u></p> <ul style="list-style-type: none"> <li><u>To discuss the events of embryonic development</u></li> <li><u>To Examine the W.M embryos.</u></li> <li><u>To follow the process of organogenesis precisely.</u></li> <li><u>To Examine the Microscopic slides, define and differentiate between the different embryonic stages.</u></li> </ul>
(ii) Teaching strategies to be used to develop these skills
<ul style="list-style-type: none"> <li><u>Lectures.</u></li> <li><u>Laboratory sections.</u></li> </ul>
(iii) Methods of assessment of students psychomotor skills
<ul style="list-style-type: none"> <li><u>Multiple choice exams.</u></li> <li><u>Practical Exams.</u></li> </ul>

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

3 hours per week and can be arranged according to the student needs

## E Learning Resources

1. Required Text(s)
<ul style="list-style-type: none"> <li>- <u>Internet search</u></li> <li>- <u>Software programme (CD, Aimation)</u></li> <li>- <u>Models</u></li> </ul>
2. Essential References
<ul style="list-style-type: none"> <li>- <u>Developmental Biology (8th edition) Gilbert, Scott F. Sunderland (MA): Sinauer Associates, Inc.; c2000</u></li> <li>- <u>Cells, Embryos, And Evolution by John Gerhart and Marc Kirschner, 1997, Blackwell Science, ISBN 0-86542-574-4</u></li> </ul>
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
<ul style="list-style-type: none"> <li>- <u>Developmental Biology (8th edition) Gilbert, Scott F. Sunderland (MA): Sinauer Associates, Inc.; c2000</u></li> <li>- <u>Cells, Embryos, And Evolution by John Gerhart and Marc Kirschner, 1997, Blackwell Science, ISBN 0-86542-574-4</u></li> </ul>
4-.Electronic Materials, Web Sites etc <u>For example</u>
5- Other learning material such as computer-based programs/CD, professional standards/regulations
<ul style="list-style-type: none"> <li>- <u>Animation programmes (Internet source)</u></li> <li>- <u>Biological Charts (Prepared by the students)</u></li> </ul>

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)
<u>Lecture rooms and laboratory (Bad Lecture rooms, low facilities in lab equipments)</u>
2. Computing resources
<u>Personal activity by the staff and few active students</u>
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
<u>Microscopic slides, microscopes, models, Charts.</u>

## G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>- <u>Student activities</u></li> <li>- <u>Student discussion</u></li> <li>- <u>Student suggestions</u></li> <li>- <u>Student evaluations</u></li> </ul>
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

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<ul style="list-style-type: none"> <li>- <u>Self evaluation (from student activities, suggestions, evaluations)</u></li> <li>- <u>Student evaluations by the Department</u></li> </ul>
<b>3 Processes for Improvement of Teaching</b> <ul style="list-style-type: none"> <li>- <u>Self-improvement</u></li> <li>- <u>Refreshing knowledge</u></li> </ul>
<b>4. Processes for Verifying Standards of Student Achievement</b> (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) <ul style="list-style-type: none"> <li>- <u>Comparing lectures with the examinations</u></li> <li>- <u>Random rechecking of exams.</u></li> </ul>
<b>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</b> <ul style="list-style-type: none"> <li>- <u>Follow up the students during lectures and practical lessons</u></li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: <b>Dr. Osama M. Sarhan.</b>	Signature:
Date Report Completed: 1.04/2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean	Signature:
Date:	





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## (C )- Applied Microbiology courses

### (1)- Water and Wastewater Microbiology 4013431-3

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology</b>
<b>A Course Identification and General Information</b>
1. Course title <b>Water &amp; Wastewater Microbiology</b>
2. Course code: <b>4013431-3</b>
1. Credit hours: <b>3hrs</b>
2. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
3. Name of faculty member responsible for the course: <b>Dr. Hussein Hassan Abulreesh (hhabulreesh@uqu.edu.sa ).</b>
4. Level/year at which this course is offered: <b>3<sup>rd</sup> Year / Level (5).</b>
5. Pre-requisites for this course (if any): <b>Bacteriology 4012422-3.</b>
6. Co-requisites for this course (if any):
7. Location if not on main campus: <b>Main campus.</b>
<b>B General Objectives:</b>
❖ After completing this course student should be able to:
1. <b>understand the principles of a range of water, wastewater and sludge treatment processes.</b>
2. <b>memorize the Standard criteria of drinking water</b>
3. <b>carry out and estimate all microbiological tests that determine the validity of water for human consumption and drinking.</b>
4. <b>demonstrate the link between water and health and show the profound influence of water supply and quality on public health.</b>
5. <b>-list all the treatments that carry out for the drinking water before use.</b>
6. <b>list the treatments that carry out for the wastewater before use.</b>
7. <b>list all the microbiological treatment for wastewater and sewage</b>
8. <b>recognize some important water-related diseases</b>
9. <b>describe how improvements in water supplies will lead to improvements in health and a reduction in morbidity and mortality rates.</b>
10. <b>apply the fundamental microbiological principles behind biological water and wastewater treatment processes</b>
11. <b>describe the Methods used for controlling and removing biofilms from water and possible indicators of the presence of a biofilm problem.</b>

### **C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

Water and wastewater Microbiology is designed for the students to understand water and wastewater microbiology concepts, water Quality Standards; dri; WHO Guidelines for Drinking Water Quality. Also, it will be covered normal flora in aquatic environments, pollution of natural water sources: types and effects on natural flora, public health issues and water-borne diseases, microbiological assessments of drinking water, detailed study of Bacterial Faecal Indicators, treatment of drinking water, public health issues related to distribution networks and biofilms, criteria for drinking and



recreational water quality, introduction to wastewater microbiology, microbiological treatment for wastewater and sewage.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ <b>General Introduction:</b> - An historical Aspects of air, water and sewage microbiology -water resources	1	2
❖ <b>Drinking Water Quality Standards</b> Water Quality Standards Treatment Objectives; WHO Guidelines for Drinking Water Quality; Estimation of Water Demand.	1	2
❖ <b>Normal flora in aquatic environments</b> - Cyanobacteria - Green algae - Diatoms - Red algae - Other types of algae - Bacteria - Viruses - Zooplankton (microscopic invertebrates) Aquatic Macrophytes (Floating weeds, Submergent weeds, Emergent weeds)	1	2
❖ <b>Water quality and pollution of natural water sources:</b> - Types and effects on natural flora: - Quality of surface waters - Water quality in flowing waters - Groundwater quality - Microbiological quality of drinking water - Chemical quality of drinking water	1	2
❖ <b>Public health issues and water-borne diseases</b> - Microbiological drinking-water quality and human health -Water-related disease incidence worldwide. - Morbidity and mortality rates of some important water-related diseases such: Amebiasis, Campylobacteriosis, <u>Cholera</u> , Cryptosporidiosis, Giardiasis, <u>Hepatitis</u> , Shigellosis, Typhoid fever, Viral gastroenteritis, Cyanobacterial Toxins.) -Bacterial Pathogens Capable of Causing Waterborne Disease: <i>Salmonella</i> , <i>Shigella</i> , <i>Vibrio cholera</i> , Enterovirulent <i>E. coli</i> , <i>Yersinia enterocolitica</i> , <i>Campylobacter jejuni</i> , <i>Legionella pneumophila</i> , <i>Helicobacter pylori</i> .) - Opportunistic and other water-associated pathogens (Examples of opportunistic pathogens of this type include <i>Pseudomonas aeruginosa</i> , certain species of <i>Flavobacterium</i> , <i>Acinetobacter</i> , <i>Klebsiella</i> , <i>Serratia</i> , <i>Aeromonas</i> and some 'slow growing' mycobacteria).	2	4

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<b>Microbiological assessments of drinking water:</b> Water sampling, Total count, presumptive test ,Confirmatory Test, Completed Test, IMVIC tests: (Indol Production test, Methyl Red test, Voges – Proskauer test, Citrate utilization test), Eckman test.	1	2
❖ <b>Detailed study of Bacterial Faecal Indicators:</b> -Why Coliforms are Chosen as Indicators ((Escherichia coli, Faecal streptococci, Sulfite reducing clostridia). -Features and condition of organisms selected as indicators.	1	2
❖ <b>Treatment of drinking water:</b> -Surface-water intakes - Mixing and flocculation Sedimentation - Flocculator-clarifiers - Filtration - Turbidity removal - Taste and odor control - Synthetic organic chemical removal - Iron and manganese removal Precipitation Softening - Fluoridation - Chlorination - Chlorination by-products - Ozone - Disinfection - Ion exchange softening and nitrate removal - Removal of dissolved salts - Sources of wastes in water treatment - Dewatering and disposal of wastes from water treatment plants	2	4
❖ <b>Public health issues related to distribution networks and biofilms</b> - Biofilms in Drinking Water Distribution - Microorganisms forming biofilms (Microbes in or associated with biofilms that may present a public health risk in the distribution system). - Factors related to biofilms formation -Corrosion control and Pipe Materials -Risks and hazardous resulting in biofilms -Health Risks from microbial Growth -Methods used for controlling and removing biofilms and possible indicators of the presence of a biofilm problem.	1	2
❖ <b>Criteria for drinking and recreational water quality</b> -Standard criteria for drinking water according WHO -Microbiological criteria -Chemical criteria (anions and cations, pH, oder) -Physical criteria (such color, turbidity .....	1	2



<b>Introduction to wastewater microbiology</b> <b>Microbiological treatment for wastewater and sewage</b> -Domestic wastewater -Industrial wastewater -Infiltration and inflow Considerations in plant design - Preliminary treatment -Pumping stations -Clarification -Biological filtration -Rotating biological contactors Biological aeration -Stabilization ponds -Effluent disinfection -Individual household disposal systems -Characteristics and quantities of waste sludges -Selection and arrangement of sludge processes -Gravity sludge thickening -Thickening of waste activated sludges -Anaerobic and Aerobic digestion Agricultural land application.	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical: 42	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**a. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course the student will be able

1. list the natural microflora in the raw water
2. outline the Standard criteria of drinking water
3. describe the different biological and chemical treatments that should be



<p>carried out for drinking water as well as for wastewater.</p> <ol style="list-style-type: none"> <li>list the different water-related diseases.</li> <li>recognize the different water resources.</li> <li>define biofilms in Drinking Water</li> <li>Summarize the Risks and hazardous resulting in biofilms</li> <li>memorize the microbiological tests that should be done for drinking water.</li> </ol>
<p>(ii) Teaching strategies to be used to develop that knowledge</p> <ul style="list-style-type: none"> <li>The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.</li> <li>At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.</li> <li>All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.</li> <li>Using images and movies</li> <li>Encouraging students to collect the new information about what the new in water and wastewater microbiology.</li> <li>Availability of the reference books and scientific sites concerning water and wastewater microbiology</li> </ul>
<p>(iii) Methods of assessment of knowledge acquired:</p> <ul style="list-style-type: none"> <li>Periodical exam (s) 10%</li> <li>Mid- term theoretical exam 20%</li> <li>Mid-term practical exam 10%</li> <li>Report and activities 5%</li> <li>Final practical exam 15%</li> <li>Final exam 40%</li> </ul>
<p><b>b. Cognitive Skills</b></p> <p>(i) Cognitive skills to be developed</p> <p>Having successfully completed the course students should be able to:</p> <ol style="list-style-type: none"> <li>Diagram the purification steps for drinking water</li> <li>Explain how the biofilm formed in water</li> <li>Differentiate between raw water and drinking water</li> <li>Predict with microorganisms which probably find in raw water</li> <li>summarize the microbiological treatment for wastewater and sewage</li> <li>estimate microbiological and biochemical tests that determine the validity of water for human consumption and drinking.</li> <li>Write the relation between water microorganisms and water-related diseases.</li> <li>write how the improvements in water supplies will lead to improvements in health and a reduction in morbidity and mortality rates.</li> <li>evaluate the Health Risks from untreated sewage water.</li> </ol>



(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
- Brain storming
- Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Quiz and exams

Discussions after the lecture

### c. Interpersonal Skills and Responsibility

At the end of the course, the student will be able to:

1. Use of needed precautions when dealing with microbes in sewage water
2. demonstrate professional attitudes and behaviors towards others.
3. Demonstrate his capability for the responsibility and Accountability
4. show Effective verbal communication with clarity.
5. propose the smart questions
6. understand and dissecting the problem so that it is fully solved understood.
7. demonstrate the assertiveness for his decision

(i) Teaching strategies to be used to develop these skills and abilities

- Lab work
- Case Study
- Active learning
- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations.

### d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.
- Interpret the laboratory data
- Know how to write a report.

(ii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.
- Field visiting for water and sewage-water treatment companies

(iii) Methods of assessment of students numerical and communication skills
1- Evaluation of presentations
2- Evaluation of reports
3- Practical exam
e. Psychomotor Skills (if applicable)
At the end of the course, the student will be able to:
1-perform the laboratory experiments precisely
2-operate all devices in lab
3- Diagram the water treatments purification.
4- prepare the different media used in water microbiology lab
(ii) Teaching strategies to be used to develop these skills
- Follow up students the students in lab and during carryout all the laboratory experiments
(iii) Methods of assessment of students psychomotor skills
• Giving additional marks for the students they have accurate laboratory results and good seminar presentation
• Practical exam.

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

- (1)- Mara, D. and Horan, N. (2003) The Handbook of Water and Wastewater Microbiology. Academic Press, San Diego, CA, USA.

##### Recommended Reading List

1. American Public Health Association (APHA) (1998) Standard Methods for the Examination of Water and Wastewater 20th edition. American Public

- Health Association, Washington DC, USA.
2. Leclerc, H., Mossel, D. A. A., Edberg, S.C. and Struijk, C. B. (2001) Advances in the bacteriology of the coliform group: their suitability as markers of microbial water safety. *Annual Reviews of Microbiology*, 55: 201-234.
  3. Tallon, P., Magajna, B., Lofranco, C. and Leung, K. T. (2005) Microbial indicators of faecal contamination in water: a current perspective. *Water, Air, and Soil Pollution*, 166: 139-166.
  4. Percival, S. L., Chalmers, R. M., Embrey, M., Hunter, P. R., Sellwood, J. and Wyn-Jones, P. (2004) *Microbiology of Waterborne Diseases*. Academic Press, San Diego, CA, USA.
  5. Leclerc, H., Schwartzbrod, L. and Dei-Cas, E. (2002) Microbial agents associated with waterborne diseases. *Critical Reviews in Microbiology*, 28: 371-409.
  6. Theron, J. and Cloete, E. (2002) Emerging waterborne infections: contributing factors, agents, and detection tools. *Critical Reviews in Microbiology*, 28: 1-26.
  7. Edberg, S. C., Rice, E. W., Karlin, R. J. and Allen, M. J. (2000) *Escherichia coli*: the best biological drinking water indicator for public health protection. *Journal of Applied Microbiology*, 88: 106S-116S.
  8. Godfree, A., Kay, D. and Wyer, M. D. (1997) Faecal streptococci as indicators of faecal contamination in water. *Journal of Applied Microbiology*, 83: 110S-119S.

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Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)  
[http://www.epa.gov/safewater/disinfection/tcr/regulation\\_revisions.html](http://www.epa.gov/safewater/disinfection/tcr/regulation_revisions.html)

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Other learning material such as computer-based programs/CD, professional standards/regulations

- Book note prepared by Associate professor Dr. Hussien Hassan Abulreesh.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - Class room is already provided with data show
  - The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
2. Computing resources
  - Providing class rooms with computers and labs with data show.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - Availability of some reference bacterial strains
  - Availability all kits for identification of the microorganisms isolated from different habitats.

- Availability of VITEK device for rapid identification of microorganisms in water.

## G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures.</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3. Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Hussein Hassan Abulreesh.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein Abulreesh. 3. Dr. Shady M. ElShehawy	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein Abulreesh	Signature:
Dean	Signature:
Date:	

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## (2)- Plant Pathology and Disease Control 4013441-3

<b>Institution:</b> UMM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology
<b>A Course Identification and General Information</b>
1. Course title and code: Plant pathology and disease control 4013441- 3
2. Credit hours: 3hrs
3. Program(s) in which the course is offered. : BSc Microbiology.
4. Name of faculty member responsible for the course: Dr. Ahmed Yehya Abdel-Mallek Mahmoud (ayahmed@uqu.edu.sa).
5. Level/year at which this course is offered: 3 <sup>rd</sup> Year / Level 5
6. Pre-requisites for this course (if any): Virology 4012412-2 / Bacteriology 4012422-3 / Mycology 4012432-3.
7. Co-requisites for this course (if any): -
8. Location if not on main campus: Main campus.

### B Objectives

❖ After completing this course student should be able to:

- identify and list the causes of plant diseases.
- discuss the ability of pathogen to distribute in nature
- describe how the pathogen can penetrate into the host
- recognize how the pathogen can overcomes the unfavorable environmental conditions
- list the different ways of pathogen reproduction.
- recognize the various symptoms in diseased plants.
- describe the plant diseases caused by fungi and their control.
- list some examples of bacterial plant diseases
- state the viral diseases and their important symptoms.
- summarize the way of distribution of plant diseases caused by viruses
- discuss the plant diseases caused by nematodes.
- List the effect of environmental conditions on severity of plant diseases
- summarize the different methods of plant diseases control

### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

The course of Plant Pathology and Control is designed to identify the different causes of plant diseases and symptoms that appear on plants as a result of infection. Also, the course will show the students different infectious causes of plant diseases such as fungal, bacterial, viral and nematode plant diseases. In addition to that, Plant Ppathology and Control course will describe how the environment can affect the disease severity and different methods of disease control.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>Introduction:</b> - Causes of plant diseases – Infectious plant diseases – Non-infectious plant diseases	1	2
<b>Characters of virulent pathogen:</b> - the ability of pathogen to reproduce. - the ability of pathogen to distribute. – the ability of pathogen to penetrate the hosts – the ability of pathogen to overcomes the unfavorable environmental conditions	1	2
<b>Causes of plant diseases:</b> - Infectious causes of plant diseases: fungi, bacteria, nematodes - Viral plant diseases - Non-infectious plant diseases : temperature, humidity, minerals, pH number...	1	2
<b>- Symptoms:</b> - Chlorosis or discoloration - Necrosis - Galls and stunting - Damping off - Wilt	1	2
<b>- Plant diseases caused by fungi:</b> - Downy mildews and symptoms - the symptoms of the disease - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	1	2
<b>- Plant diseases caused by fungi (continued):</b> - Powdery mildews - the symptoms of the disease - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	1	2
<b>- Plant diseases caused by fungi (continued):</b> - Damping off and seedling blight- the symptoms of the disease -Early and late blight - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	1	2
<b>Plant diseases caused by fungi (continued):</b> - Wilts- the symptoms of the disease - Vascular wilts caused by fungi - Fungal genera causing the disease - Bacterial vascular wilts - Disease control	1	2

<ul style="list-style-type: none"> <li>- Plant diseases caused by fungi (continued):</li> <li>- Rusts and smuts- the symptoms of the disease</li> <li>- Fungi causing the diseases, life cycle of one example for each</li> <li>- Factors affecting the disease severity</li> <li>- Disease control</li> </ul>	1	2
<ul style="list-style-type: none"> <li>- Plant diseases caused by bacteria (continued):</li> <li>- Fire blight of pear and apple - the symptoms of the disease</li> <li>- bacteria causing the diseases.</li> <li>- Factors affecting the disease severity</li> <li>- Disease control</li> </ul>	1	2
<ul style="list-style-type: none"> <li>- Plant diseases caused by bacteria (continued):</li> <li>- Leaf spots- the symptoms of the diseases</li> <li>- Bacterial and fungal leaf spots</li> <li>- Angular spots, brown spots, leaf spots of tomato and potato</li> <li>- Factors affecting the disease severity.</li> <li>- Disease control.</li> </ul>	1	2
<ul style="list-style-type: none"> <li>- Plant diseases caused by bacteria (continued):</li> <li>- Bacterial soft rots</li> <li>- Factors affecting the disease severity.</li> <li>- Disease control.</li> <li>- Viral diseases</li> </ul>	1	2
<ul style="list-style-type: none"> <li>- Viral diseases (continued):</li> <li>- Symptoms of viral diseases.</li> <li>- Different ways of viral diseases distribution</li> <li>- Viral diseases control.</li> </ul>	1	2
<ul style="list-style-type: none"> <li>- Fungal classification (continued):</li> <li>- Plant diseases caused by nematodes</li> <li>- Root knot disease, symptoms and the disease control</li> <li>- Environmental factors affecting infectious diseases severity</li> </ul>	1	2
	14 weeks	28 hours

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical: 48	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay)**



<b>4. Development of Learning Outcomes in Domains of Learning</b> For each of the domains of learning shown below indicate: <ul style="list-style-type: none"> <li>• A brief summary of the knowledge or skill the course is intended to develop;</li> <li>• A description of the teaching strategies to be used in the course to develop that knowledge or skill;</li> <li>• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</li> </ul>	
<b>a. Knowledge</b>	
<b>Upon successful completion of this course The student will be able to:</b> <ol style="list-style-type: none"> <li>1- identify the causes of plant diseases.</li> <li>2- list the different causes of plant diseases.</li> <li>3- discuss the ability of pathogen to distribute in nature</li> <li>4- describe how the pathogen can penetrate into the host</li> <li>5- recognize how the pathogen can overcomes the unfavorable environmental conditions</li> <li>6- list the different ways of pathogen reproduction.</li> <li>7- recognize the various symptoms in diseased plants.</li> <li>8- describe the plant diseases caused by fungi and their control.</li> <li>9- list some examples of bacterial plant diseases</li> <li>10- state the viral diseases and their important symptoms.</li> <li>11- summarize the way of distribution of plant diseases caused by viruses</li> <li>12- discuss the plant diseases caused by nematodes.</li> <li>13- List the effect of environmental conditions on severity of plant diseases</li> <li>14 - summarize the different methods of plant diseases control</li> </ol>	
<b>(ii) Teaching strategies to be used to develop that knowledge</b> <ol style="list-style-type: none"> <li>1- Lectures which must start with preliminary one showing course contents</li> <li>2- Using images and movies</li> <li>3- Encouraging student to identify different symptoms of plant diseases.</li> <li>4- Enable the reference books and scientific sites concerning plant pathology in internet.</li> <li>5- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions</li> </ol>	
<b>(iii) Methods of assessment of knowledge acquired</b> <ol style="list-style-type: none"> <li>1- Periodical exam 10%</li> <li>2- Brief article and essay 5%</li> <li>3- Mid- term theoretical exam 20%</li> <li>4- Final practical exam 15%</li> <li>5- Final exam 50%</li> </ol>	
<b>b. Cognitive Skills</b>	
<b>(i) Cognitive skills to be developed</b> Having successfully completed the course students should be able to: <ol style="list-style-type: none"> <li>1- summarize the different causes of plant diseases.</li> <li>2- compare between infectious and non- infectious diseases.</li> <li>3- describe penetration ways of pathogen into the host.</li> <li>4- explain the ways that enable the pathogen to overcome unfavorable</li> </ol>	



<p>conditions</p> <p>5- summarize the different ways of pathogen reproduction.</p> <p>6- differentiate between the various symptoms in diseased plants</p> <p>7- diagram some fungal genera causing downy mildews</p> <p>8- differentiate between fungal genera causing powdery mildews.</p> <p>9- compose some examples of bacterial plant diseases</p> <p>10- explain the viral diseases and their important symptoms.</p> <p>11- write the ways of distribution of plant diseases caused by viruses</p> <p>12- justify nematodes and plant diseases</p> <p>10- summarize the environmental conditions affecting the severity of plant diseases</p> <p>11- diagram the studied basidiomycetes genera</p> <p>12- design the methods of disease control</p>
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <p>1- Giving examples both in lectures and labs and sharing students in microscopical examination and description.</p> <p>2- Practical examination of some diseased plant specimens to describe the symptoms and to identify the pathogens in laboratory</p>
<p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> <li>• Exam must contain questions that can measure these skills(see copies of exams)</li> <li>• Oral discussion in lectures and labs</li> </ul>
<p>c. Interpersonal Skills and Responsibility</p>
<p>(ii) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <p>At the end of the course, the student will be able to:</p> <p>1- obtain knowledge by himself from different sources</p> <p>2- choose the different media that can be used in isolation and identification</p> <p>3- Demonstrate professional attitudes and behaviors towards others.</p>
<p>(iii) Teaching strategies to be used to develop these skills and abilities</p> <p>1- Open class discussions with students for minutes during lectures and labs.</p> <p>2- Students (as groups and individuals) should give reports concerning certain topics of the course.</p>
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <p>1- Evaluate the efforts of each student in preparing the report.</p> <p>2- Evaluate the scientific values of reports</p> <p>3- Evaluation of the role of each student in lab group assignment</p>
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(iv) Description of the skills to be developed in this domain.</p> <p>1- Enhancing the ability of students to use computers and internet.</p> <p>2- Follow-up the students to show them how they can prepare reports</p>
<p>(v) Teaching strategies to be used to develop these skills</p> <p>1- Homework (preparing a report on some topics related to the course depending on web sites).</p> <p>2- Seminars presentation</p> <p>3- Practical during carryout the experiments in the lab.</p>

(iii) Methods of assessment of students numerical and communication skills 1- Evaluation of presentations 2- Evaluation of reports 3- Practical exam.
e. Psychomotor Skills (if applicable)
Description of the psychomotor skills to be developed and the level of performance required At the end of the course the students should be able to: 1- prepare of student skills to use microscope 2- Enhancement of student ability to use light microscope in accuracy. 3- Prepare culture media, the ways of isolation and purification of fungi cultures.
(ii) Teaching strategies to be used to develop these skills Follow up students during preparing slides, media and examination of diseased specimens
(vi) Methods of assessment of students psychomotor skills 1- Giving additional marks for the students they have accurate laboratory results and good seminar presentation 2- Practical exam.

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

2. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10hrs.

#### E Learning Resources

Required Text(s):
<ul style="list-style-type: none"> <li>Course note prepared by faculty member responsible for the course: Prof. Dr. Ahmed Yehya Abdel-Mallek</li> </ul>
3. Essential References
<ul style="list-style-type: none"> <li>Plant Pathology (1986) Mahmoud Maher, Mostafa Mohamed Faheem, Yousef Abdelhamed Abdo, AlSayed Ahmed Salama</li> <li>Plant Diseases (1999) David Ingram, N. F. Robertson. Harper Collins Publisher.</li> </ul>

<ul style="list-style-type: none"> <li>• <b>Plant Pathology (2005) George Nicolas Agrios. Elsevier Science Publishing Co Inc.</b></li> </ul>
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
4- Electronic Materials, Web Sites etc <ul style="list-style-type: none"> <li>• <a href="https://en.wikipedia.org/wiki/Plant_pathology">https://en.wikipedia.org/wiki/Plant_pathology</a></li> <li>• <a href="https://en.wikipedia.org/wiki/Phytophthora_infestans">https://en.wikipedia.org/wiki/Phytophthora_infestans</a></li> </ul>
5- Other learning material such as computer-based programs/CD, professional standards/regulations

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) <ul style="list-style-type: none"> <li>• <b>Class room is already provided with data show</b></li> <li>• <b>The area of class room is suitable concerning the number of enrolled students and air conditioned.</b></li> </ul>
2. Computing resources <ul style="list-style-type: none"> <li>• <b>Providing class rooms with computers.</b></li> </ul>
4. Other resources (specify --e.g. If specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none"> <li>• <b>Providing the lab with prepared slides</b></li> <li>• <b>Availability new light microscopes</b></li> </ul>

#### G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> <li>• <b>Questionnaires</b></li> <li>• <b>Class room discussion</b></li> </ul>
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department <ul style="list-style-type: none"> <li>• <b>Revision of student answer paper by another staff member.</b></li> <li>• <b>Analysis the grades of students.</b></li> </ul>
3 Processes for Improvement of Teaching <ul style="list-style-type: none"> <li>• <b>Preparing the course as PPT.</b></li> <li>• <b>Using scientific movies.</b></li> <li>• <b>Periodical revision of course content.</b></li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) <ul style="list-style-type: none"> <li>• <b>After the agreement of Department and Faculty administrations</b></li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. <ul style="list-style-type: none"> <li>• <b>Periodical revision by Quality Assurance Units in the Department and institution</b></li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: <b>Prof. Dr. Ahmed Yehya Abdel-Mallek .</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy</b>	Signature:
Date: <b>1.04.2018</b>	
Head of Program <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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### (3)- Microbial Physiology 4013452-3

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology</b>

#### A Course Identification and General Information

16. Course title <b>Microbial Physiology</b> 17. Course code: <b>4013452-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
18. Name of faculty member responsible for the course: <b>Dr. Abdelrahman Assaeedi (asassaeedi@uqu.edu.sa)</b>
5. Level/year at which this course is offered: <b>3<sup>rd</sup> Year / Level 6</b>
6. Pre-requisites for this course (if any): <b>Biochemistry (4012312-3) / Introductory Microbiology (4012401-4).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

#### B Objectives

- ❖ After completing this course student should be able to:
  1. Distinguish between the eukaryotic and prokaryotic cell structure.
  2. Describe the bacterial cell components and its function role in the cell
  2. Define basic concepts of microbial physiology.
  3. Explain microbial growth, growth kinetics and factors affecting growth.
  4. Evaluate the importance of central pathways off carbohydrate metabolism for microbial physiology.
  5. Cell enzymes and its role in nutrition
  5. Illustrate macromolecular synthesis and processing.
  6. Link the microbial physiology to the genomics of cells.

#### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course is designed for students of applied microbiology to cover the basic aspects of microbial physiology. To explain prokaryotic and eukaryotic structure and composition as well as the means by which nutrients are transported into cells across membranes. The important metabolic processes that occur in prokaryotes and eukaryotic microorganisms under different environmental conditions will be discussed. Explain the central metabolic pathways starting from glucose, as well as other trophic variations found in prokaryotes including the use of organic compounds other than glucose, anaerobic fermentation, anaerobic respiration, chemolithotrophy and photosynthesis. Kinetic of the energy and biochemistry of Nitrogen fixation also will be covered. The regulation of metabolism through control of gene expression and enzyme activity is also covered. Finally, development of the laboratory skills for students will be targeted.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ <b>Introduction:</b> -Overview of microbial physiology -Microbial diversity and relation to activity	1	2
❖ <b>Microbial growth</b> - Growth kinetics, growth curve, measurement of growth and growth yields. - Synchronous growth and Continuous culture. Factors affecting microbial growth.	2	4
❖ <b>Metabolic diversity among microorganisms</b> Respiration, Photosynthesis, acetogenesis, methanogenesis, nitrogen fixation, and hydrocarbon transformation in microorganisms.	2	2
❖ <b>Central pathways and microbial activities</b> - Carbohydrates: major pathways (EMP, TCA, Glyoxylate cycle). Biosynthesis of Oligosaccharides. Lipids: Fatty acid biosynthesis and oxidation	4	8
❖ <b>Aerobic vs anaerobic processes</b> - Respiratory chains (components and function) - Aerobic vs anaerobic respiration and relation to growth - Growth of anaerobes Fermentation and fermentative microorganisms	2	4
❖ <b>Biocatalysis and Biocatalyst</b> -Enzymes and their classification, Enzyme kinetics, allosteric enzymes, -Michaelis- Menten equation, - coenzyme, isozyme, -Enzyme inhibition and regulation. -Enzyme structure and function. -Factors affecting enzyme activity .	3	6
	14 weeks	28hrs

2 Course components (total contact hours per semester):			
Lecture : 28	Tutorial:	Practical: 42	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay).
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#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

##### b. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

13. Define basic concepts of microbial physiology.
14. Distinguish between the eukaryotic and prokaryotic cell structure and function.
15. Explain microbial growth, growth.
16. Define types of membrane transport for nutrient uptake and protein excretion.
17. Describe the bacterial cell components and its function role in the cell
18. 3. Explain microbial growth, growth kinetics and factors affecting growth.

##### (ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in microbial physiology
- Enable the reference books and scientific sites concerning bacteriology in internet.

##### (iii) Methods of assessment of knowledge acquired:

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

##### b. Cognitive Skills

##### (i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1. Evaluate the importance of central pathways of carbohydrate metabolism for microbial physiology
2. Link the microbial physiology to the genomics of cells.

3. Explain how some microorganisms can degrade the macromolecule polymers

4. Calculate the kinetic energy in aerobic and anaerobic microbes

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures

- Brain storming

- Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

- Quiz and exams

Discussions after the lecture

#### c. Interpersonal Skills and Responsibility

- At the end of the course, the student will be able to:

- Analyze the growth kinetic data.

Illustrate macromolecular synthesis and processing.

(iv) Teaching strategies to be used to develop these skills and abilities

- Lab work

- Case Study

- Active learning

- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.

- Evaluate the scientific values of reports.

- Evaluate the work in team

- Evaluation of the role of each student in lab group assignment

- Evaluation of students presentations

#### d. Communication, Information Technology and Numerical Skills

(vii) Description of the skills to be developed in this domain.

At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.

- Interpret microbiological data

- Calculate enzymes activities

- Know how to write a report.

(viii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).

- Seminars presentation

- Practical during carryout the experiments in the lab.

(iii) Methods of assessment of students numerical and communication skills

- Evaluation of presentations

- Evaluation of reports

- Practical exam



**e. Psychomotor Skills (if applicable)**

At the end of the course, the student will be able to:

- Carry out the Experiments to study the factors affecting enzymes and their activities

**(ii) Teaching strategies to be used to develop these skills**

- Follow up students the students in lab and during carryout all the laboratory experiments

**(ix) Methods of assessment of students psychomotor skills**

- Giving additional marks for the students they have accurate laboratory results and good seminar presentation
- Practical exam.

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

**D. Student Support**

5. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

**E. Learning Resources**

**Required Text(s):**

- 1- Book note prepared by Dr. Abdelrahman Assaedi
- 2- Madigan, M.T; Martinko, J.M and Parker, J (2012). Brocks Biology of Microorganisms. (13<sup>th</sup> ed.). Prentice Hall International.ISBN-13: 978-0-321-64963-8

**Recommended Reading List**

- 1-Moat, A.G; Foster, J.W and Spector, M.P (2002). Microbial Physiology (4<sup>th</sup> ed.). John Wiley & Sons Inc.
- 2- Cappuccino, J.G and Sherman, N (2002). Microbiology, a Laboratory Manual (6<sup>th</sup> ed.). Benjamin Cummings
6. Prescott, L., Harley, J. and Klien, D. (2005). Microbiology, MacGraw

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

-BioCyc Database Collection (<http://biocyc.org/>)

-ASM-Microb Library (<http://www.microbelibrary.org/>)

Other learning material such as computer-based programs/CD, professional standards/regulations

- **PPT prepared by Dr. Abdelrahman Asaedii**

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- **Class room is already provided with data show**
- **The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.**

##### 2. Computing resources

- **Providing class rooms with computers and labs with data show.**

##### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- **Availability of some reference bacterial strains**
- **Availability different specific media and chemicals used for study the factors affects enzymes and microbial growth**

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- **Questionaries**
- **Open discussion in the class room at the end of the lectures.**

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- **Revision of student answer paper by another staff member.**
- **Analysis the grades of students.**

##### 3. Processes for Improvement of Teaching

- **Preparing the course as PPT.**
- **Using scientific movies.**
- **Coupling the theoretical part with laboratory part**
- **Periodical revision of course content.**

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- **After the agreement of Department and Faculty administrations.**

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodical revision by Quality Assurance Units in the Department and institution.**

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Abdulrahman S. Assaeedi. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

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(4)- Molecular Microbiology 4013462-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>

**A Course Identification and General Information**

19. Course title <b>Molecular Microbiology</b>
20. Course code: <b>4013462-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
4. Name of faculty member responsible for the course: Associate <b>Prof. Dr. Gamal Osman</b>
5. Level/year at which this course is offered: <b>3<sup>rd</sup> Year / Level 6</b>
6. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3) / Biochemistry (4012312-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

-Upon successful completion of this course, the student should:
❖ know the differences between Eukaryote and prokaryote
❖ Know the structure of DNA.
❖ He should be aware with the DNA replication.
❖ He should be aware with the different types of RNA.
❖ He should understand the transcription.
❖ He will be able to differentiate between RNA and DNA
❖ Also, he should be know the translation
❖ He will be able to find and understand mutation
❖ He should be familiar with some bioinformatics.
❖ He should understand the genetic code

**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course aims to give the student an idea of the primary and secondary cellular structures and replication of the genetic material and studying of different types of RNA and the genetic code and regulation of gene expression.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction and Mendelian Genetics	1	2
❖ DNA Structure	1	2
❖ DNA replication		
❖ Different types of RNA.	1	2
❖ Transcription	3	6
❖ Genetic code	4	8
❖ Translation	2	4

❖ Mutation	2	4
❖ Regulation of gene expression in Prokaryote		
❖ Regulation of gene expression in Eukaryote		
❖ Some Bioinformatics		
<b>Total</b>	<b>14 weeks</b>	<b>28hrs</b>

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

<b>4. Development of Learning Outcomes in Domains of Learning</b> <b>For each of the domains of learning shown below indicate:</b> <ul style="list-style-type: none"> <li>• A brief summary of the knowledge or skill the course is intended to develop;</li> <li>• A description of the teaching strategies to be used in the course to develop that knowledge or skill;</li> <li>• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</li> </ul>	
<b>c. Knowledge : Description of the knowledge to be acquired</b>  <b>Upon successful completion of this course, the student:</b> <ul style="list-style-type: none"> <li>❖ will understand the differences between DNA and RNA</li> <li>❖ will understand the role of different types of RNA</li> <li>❖ will Have knowledge about what causes the mutation and its different types</li> <li>❖ will be familiar with the transcription and translation</li> <li>❖ will be aware with some bioinformatics.</li> </ul>	
<b>(ii) Teaching strategies to be used to develop that knowledge</b> <ul style="list-style-type: none"> <li>• Lectures which must start with preliminary one showing course contents</li> <li>• Using images and movies</li> <li>• Studying DNA and RNA in the lab.</li> <li>• Encouraging student to collect the new information about replication , transcription and translation..</li> <li>• Enable the reference books and scientific sites concerning molecular microbiology in internet.</li> </ul>	
<b>(iii) Methods of assessment of knowledge acquired:</b> <ul style="list-style-type: none"> <li>• Periodical exam and reports 10%</li> <li>• Mid- term theoretical exam 20%</li> </ul>	

- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

#### b. Cognitive Skills

##### (i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

- thinking and give information about the importance of DNA in life
- give information about the role of DNA and RNA in translation.
- Explain the mutation
- Understand the genetic code

##### (ii) Teaching strategies to be used to develop these cognitive skills:

- Through lectures, videos and some laboratory experiments which introduced to the students to enable them to understand the is the DNA structure
- Demonstrate the different types of mutation.

##### (iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

#### c. Interpersonal Skills and Responsibility

##### (v) Description of the interpersonal skills and capacity to carry responsibility to be developed

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

##### (vi) Teaching strategies to be used to develop these skills and abilities

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

##### (iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.

#### d. Communication, Information Technology and Numerical Skills

##### (x) Description of the skills to be developed in this domain.

- Enhancing the ability of students to use computers and internet.

##### (xi) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).

##### (iii) Methods of assessment of students numerical and communication skills

- Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

**Description of the psychomotor skills to be developed and the level of performance required**

**Students should be able to:**

- Practice the basic Lab. Skills
- Use light microscope in accuracy.
- Prepare microscopic slides and culture media.
- Isolation of DNA and RNA

**(ii) Teaching strategies to be used to develop these skills**

- Follow up students during preparing slides, examination and isolation.

**(xii) Methods of assessment of students psychomotor skills**

- Giving additional marks for preparing the best purified DNA and RNA

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

**D. Student Support**

**7. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

**E. Learning Resources**

**Required Text(s):**

- Course note and PPT prepared by faculty member responsible for the course: Prof. Dr. Gamal Osman
- Recommended Books and Reference Material (Journals, Reports, etc)
  1. Molecular Microbiology | Stephen J.W. Busby | Springer  
[www.springer.com/us/book/9783642720734](http://www.springer.com/us/book/9783642720734)
  2. Molecular Microbiology: Diagnostic Principles and Practice ...  
[www.amazon.com](http://www.amazon.com)
  3. Advances in Molecular and Cellular Microbiology

[ebooks.cambridge.org/series\\_landing.jsf;...Molecular...Microbiology](https://ebooks.cambridge.org/series_landing.jsf;...Molecular...Microbiology)

Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by prof. Dr. Gamal Osman

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

##### 2. Computing resources

- Providing class rooms with computers and labs with data show.

##### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference
- Availability new light microscopes
- Availability different specific media and chemicals used for isolation ( List with the Head of the Department)
- Availability of DNA and protein cells

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

##### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

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Faculty member responsible for this course:

Prepared by faculty staff: 1. Prof. Gamal E. H. Osman. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

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(5)- Medical Microbiology 4013472-3

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology
<b>A Course Identification and General Information</b>
8. Course title <b>Medical Microbiology</b>
9. Course code: <b>4013472-3</b>
10. Credit hours: <b>3hrs</b>
11. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
12. Name of faculty member responsible for the course: <b>Dr. Sameer Organji (srorganji@uqu.edu.sa)</b>
13. Level/year at which this course is offered: <b>3<sup>rd</sup> Year / Level 6</b>
14. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3).</b>
15. Co-requisites for this course (if any): <b>---</b>
16. Location if not on main campus: <b>Main campus.</b>
<b>B Objectives:</b>
<p>❖ After completing this course student should be able to:</p> <ol style="list-style-type: none"> <li>1. define the medical Microbiology</li> <li>2. list the important pathogen bacterial genera that cause human disease.</li> <li>3. describe the methodology for isolation and identification of pathogens</li> <li>4. Summarize the internal and external structure of the pathogen bacterial cells.</li> <li>5. List the diseases caused by pathogen microorganisms.</li> <li>6. Recognize the symptom of diseases caused by pathogen microorganisms</li> <li>7. develop familiarity with the major types of pathogenic microorganisms and the diseases that they produce in humans.</li> <li>8. demonstrate the ability to use the laboratory to diagnose infections, including appropriate specimen collection and test ordering.</li> <li>9. outline the principle of diseases and its distribution</li> <li>10. List the suitable antibiotics to treat of each disease.</li> <li>11. Explain, analyze and interpret the laboratory findings.</li> <li>12. Differentiate between the symptom of fungal and bacterial pathogens</li> <li>13. Write briefly the general characterizations of each pathogen bacterial group.</li> </ol>

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course is designed for students of Applied Microbiology to cover the basic principles of Medical microbiology and infectious disease. It covers mechanisms of infectious disease transmission, principles of aseptic practice, and the role of the human body's normal microflora. The biology of bacterial, viral, fungal, and parasitic pathogens and the diseases they cause are covered. Relevant clinical examples are provided. The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body. It also provides opportunities to develop informatics and diagnostic skills,

including the use and interpretation of laboratory tests in the diagnosis of infectious diseases.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction: - An Historical Overview about the Medical Microbiology and the role of scientists to developing this field.	1	2
❖ Bacterial Classification, Morphology & Cell Structure: medically important groups of microorganisms, classification (taxonomy) of bacteria, morphology (cell shapes, Gram stain), ultrastructural features internal and external bacterial cell structure (cytoplasm, cell envelope, external features), bacterial spores.	1	2
❖ Most medical important bacterial genera Role of the natural microflora of the human body .	2	4
❖ Distribution of natural Gram positive and Gram-negative microflora according to its location to the human body .	2	4
❖ Antibiotics: - Definition - Classification - Suitable Dosages - Mode of actions - Precautions that must be taking in consideration when the antibiotic were used.	2	4
❖ Important human pathogens of Gram-positive cocci: (Classification, the pathogenicity, methods used for detection) - The Gram-Positive Cocci – I: <i>Staphylococcus aureus</i> (cutaneous infections, food poisoning, endocarditis, toxic shock syndrome, etc.), <i>Staphylococcus epidermidis</i> (endocarditis, catheter & shunt infections, etc.), <i>Enterococcus</i> (urinary infections, septicemia, etc.). - The Gram-Positive Cocci – II: <i>Streptococcus pyogenes</i> (pharyngitis, impetigo, erysipelas, rheumatic fever, etc.), <i>Streptococcus pneumoniae</i> (pneumococcal pneumonia, otitis media, sinusitis, meningitis, etc.), <i>Streptococcus agalactiae</i> (neonatal diseases, other infections).	2	4
❖ Important human pathogens of Gram-negative cocci (Classification, the pathogenicity, methods used for detection)	1	2

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❖ Important human pathogens of Gram-negative bacilli : Enterobacteriaceae: Classification, the pathogenicity, methods used for detection): -The Gram-Negative Aerobic Bacilli: <i>Pseudomonas aeruginosa</i> (pulmonary, skin & urinary infections, etc.), <i>Bordetella pertussis</i> (whooping cough), <i>Francisella tularensis</i> (tularemia), <i>Brucella</i> (undulant fever, etc.), <i>Haemophilus</i> (meningitis, otitis, chancroid, arthritis, etc.), <i>Legionella pneumophila</i> (Legionnaires' Disease, Pontiac fever).	1	2
❖ Important human pathogens of Gram-positive bacilli: Classification, the pathogenicity, methods used for detection): The Gram-Positive Bacilli: - <i>Bacillus anthracis</i> (anthrax), <i>Listeria monocytogenes</i> (neonatal diseases, etc.), <i>Corynebacterium diphtheriae</i> (diphtheria), <i>Clostridium perfringens</i> (gasgangrene, food poisoning, etc.), <i>Clostridium tetani</i> (tetanus), <i>Clostridium botulinum</i> (botulism), <i>Clostridium difficile</i> (gastroenteritis), <i>Erysipelothrix rhusiopathiae</i> (erysipeloid).	1	2
❖ Most important human pathogen Fungi: Classification, the pathogenicity, methods used for detection)	1	2
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical: 42	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

##### d. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

1. define the medical Microbiology
2. list the important pathogen bacterial genera that cause human disease.
3. describe the methodology for isolation and identification of pathogens
4. Summarize the internal and external structure of the pathogen bacterial cells.
5. List the diseases caused by pathogen microorganisms.
6. Recognize the symptom of diseases caused by pathogen microorganisms
7. familiarize with the major types of pathogenic microorganisms
8. List the suitable antibiotics to treat of each disease.
9. demonstrate the ability to use the laboratory to diagnose infections, including appropriate specimen collection and test ordering.
10. outline the principle of diseases and its distribution
11. Write briefly the general characterizations of each pathogen bacterial group.

##### (ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in microbial physiology
- Make the reference books and scientific sites concerning medical microbiology in internet available.

##### (iii) Methods of assessment of knowledge acquired:

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

## b. Cognitive Skills

### (i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1. Summarize the internal and external structure of the pathogen bacterial cells.
2. develop familiarity with the major types of pathogenic microorganisms and the diseases that they produce in humans..
3. Explain, analyze and interpret the laboratory findings.
4. Differentiate between the symptom of fungal and bacterial pathogens
5. Write briefly the general characterizations of each pathogen bacterial group.

### (ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
- Brain storming
- Discussion

### (iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

## c. Interpersonal Skills and Responsibility

- At the end of the course, the student will be able to:
  1. Analyze the laboratory data.
  2. Choose the suitable media method for isolation the pathogen bacteria and fungi
  3. Demonstrate professional attitudes and behaviors towards others.

### (vii) Teaching strategies to be used to develop these skills and abilities

- Lab work
- Case Study
- Active learning
- Small group discussion

### (iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

## d. Communication, Information Technology and Numerical Skills

### (xiii) Description of the skills to be developed in this domain.

At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.
- Interpret the laboratory data
- Know how to write a report.

<p>(xiv) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>Seminars presentation</li> <li>Practical during carryout the experiments in the lab.</li> </ul> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ol style="list-style-type: none"> <li>Evaluation of presentations</li> <li>Evaluation of reports</li> <li>Practical exam</li> </ol>
<p>e. Psychomotor Skills (if applicable)</p> <p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>perform the laboratory experiments precisely</li> <li>operate all devices in lab</li> <li>prepare solutions and reagents used for detection and diagnosis precisely.</li> </ol>
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>Follow up students the students in lab and during carryout all the laboratory experiments</li> </ul>
<p>(xv) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>Giving additional marks for the students they have accurate laboratory results and good seminar presentation</li> <li>Practical exam.</li> </ul>

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

<p>8. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)</p> <p>Office hours: 10 hrs.</p>
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## E. Learning Resources

### Required Text(s):

- (1)- Murray, Patrick.R., Rosenthal, Ken.S., Pfaller, Michael, A., (2009) *Medical Microbiology 6<sup>th</sup> edition*. Mosby  
(2)- Jawetz, Melnick, & Adelberg's. (2007) *Medical Microbiology 24th edition*. Book  
Publisher: McGraw-Hill Medical.

### Recommended Reading List

- *Sherris Medical Microbiology, 4th Ed.* (2004) Ryan and Ray (Eds.), McGraw-Hill, ISBN: 0-8385-8529-9.  
- *Medical Microbiology, A Guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Diagnosis, and Control, 16th Ed.* (2002) Greenwood, Slack, and Peutherer (Eds.), Churchill Livingstone; ISBN: 0443-07077-6.  
- *Medical Microbiology, 3rd Ed.* (2004) Mims, DOckrell, Goering, Roitt, Wakelin, and Zuckerman, Mosby; ISBN: 0-7234-3259-7.  
- *Medical Microbiology & Immunology: Examination & Board Review, 7th Ed.* (2002) Levinson and Jawetz, Lange Medical Books/McGraw Hill; ISBN: 0-07-138217-8.

### Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

-<http://www.cdc.gov/mmwr/>

### Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by Dr. Samir Organjii

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

### 2. Computing resources

- Providing class rooms with computers and labs with data show.

### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability all kits for identification of pathogen bacteria
- Availability of VITEK device for rapid identification of the pathogen bacteria



### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3. Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Sameer Organji. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

(6)- Biotechnology 4014401-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>

**A Course Identification and General Information**

21. Course title <b>Biotechnology</b>
22. Course code: <b>4014401-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
23. Name of faculty member responsible for the course: Associate <b>Prof. Dr. Gamal Osman.</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 7</b>
6. Pre-requisites for this course (if any): <b>Molecular Microbiology 4013462-3</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

-Upon successful completion of this course, the student should:
❖ Knowing the different fields of biotechnology
❖ Knowing restriction enzymes and how it works.
❖ He should be aware with the different ways of cutting DNA using restriction enzymes.
❖ He should be aware with the different methods of gene isolation.
❖ He should understand gene cloning.
❖ He will be able to run a PCR.
❖ Also, he should be know the genetic map, fingerprinting and microarray.
❖ He will be able to find and understand forensic
❖ He should be familiar with synthetic genes and edible vaccines.
❖ He should understand bioethics

**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

**This course aims to give the student an idea of different field of biotechnology  
Such as gene isolation , gene cloning and PCR.**

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction	1	2
❖ Restriction Enzymes	1	2
❖ Gene isolation		
❖ Gene cloning	1	2
❖ PCR	3	6
❖ Fingerprinting and genetic map	4	8
❖ Microarray, forensic , synthetic gene	2	4

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❖ Edible vaccine	2	4
❖ Genetically modified organisms		
❖ Production of different economically product using biotechnology such as Insulin		
❖ Bioethics		
Total learning weeks and Contact hours	14 weeks	28hrs

2 Course components (total contact hours per semester):			
Lecture : 28	Tutorial:	Practical: 42	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay)

4. Development of Learning Outcomes in Domains of Learning For each of the domains of learning shown below indicate: <ul style="list-style-type: none"> <li>• A brief summary of the knowledge or skill the course is intended to develop;</li> <li>• A description of the teaching strategies to be used in the course to develop that knowledge or skill;</li> <li>• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</li> </ul>
e. Knowledge : Description of the knowledge to be acquired  Upon successful completion of this course, the student: <ul style="list-style-type: none"> <li>❖ will understand the differences which cut DNA</li> <li>❖ will understand gene isolation and cloning</li> <li>❖ will Have knowledge about fingerprinting , synthetic genes and GMO</li> <li>❖ will be familiar with the edible vaccines</li> <li>❖ will be aware with bioethics .</li> </ul>
(ii) Teaching strategies to be used to develop that knowledge <ul style="list-style-type: none"> <li>• Lectures which must start with preliminary one showing course contents</li> <li>• Using images and movies</li> <li>• Studying restriction enzymes in the lab.</li> <li>• Encouraging student to collect the new information about GMO</li> <li>• Enable the reference books and scientific sites concerning biotechnology in internet.</li> </ul>
(iii) Methods of assessment of knowledge acquired: <ul style="list-style-type: none"> <li>• Periodical exam and reports 10%</li> <li>• Mid- term theoretical exam 20%</li> <li>• Mid-term practical exam 5%</li> </ul>

- Final practical exam 15%
- Final exam 50%

#### **b. Cognitive Skills**

##### **(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

- thinking and give information about the importance of biotechnology in life
- give information about the importance of edible vaccine and GMO for .
- Explain the synthetic genes
- Understand the bioethics

##### **(ii) Teaching strategies to be used to develop these cognitive skills:**

- Through lectures, videos and some laboratory experiments which introduced to the students to enable them to understand the is the biotechnology
- Demonstrate the different types of GMO.

##### **(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.

#### **c. Interpersonal Skills and Responsibility**

##### **(viii) Description of the interpersonal skills and capacity to carry responsibility to be developed**

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

##### **(ix) Teaching strategies to be used to develop these skills and abilities**

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

##### **(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.

#### **d. Communication, Information Technology and Numerical Skills**

##### **(xvi) Description of the skills to be developed in this domain.**

- Enhancing the ability of students to use computers and internet.

##### **(xvii) Teaching strategies to be used to develop these skills**

- Homework (preparing a report on some topics related to the course depending on web sites).

##### **(iii) Methods of assessment of students numerical and communication skills**

- Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

Description of the psychomotor skills to be developed and the level of performance required

Students should be able to:

- Practice the basic Lab. Skills
- Use light microscope in accuracy.
- Cut DNA by restriction enzymes.
- Isolation of gene
- cloning

**(ii) Teaching strategies to be used to develop these skills**

- Follow up students during preparing slides, examination and isolation.

**(xviii) Methods of assessment of students psychomotor skills**

- Giving additional marks for preparing the best cut DNA

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

**D. Student Support**

**9. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

**E. Learning Resources**

**Required Text(s):**

- Course note and PPT prepared by faculty member responsible for the course: Prof. Dr. Gamal Osman
- Recommended Books and Reference Material (Journals, Reports, etc)

**Industrial Biotechnology (PDF 37P) | Download book**

[http://www.freebookcentre.net/biology-books-download/Industrial-Biotechnology-\(PDF-37P\).html](http://www.freebookcentre.net/biology-books-download/Industrial-Biotechnology-(PDF-37P).html)

**Basic Biotechnology - Cambridge Books Online - Cambridge ...**

<http://ebooks.cambridge.org/ebook.jsf%3Fbid%3DCBO9780511802409>

**Medical Biotechnology - United Nations University**

<http://archive.unu.edu/unupress/sample-chapters/medicalbiotechnology.pdf>

Other learning material such as computer-based programs/CD, professional standards/regulations

- **PPT prepared by prof. Dr. Gamal Osman**

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- **Class room is already provided with data show**
- **The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.**

##### 2. Computing resources

- **Providing class rooms with computers and labs with data show.**

##### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- **Availability of some reference**
- **Availability new light microscopes**
- **Availability different specific media and chemicals used for isolation ( List with the Head of the Department)**
- **Availability of DNA and protein cells**

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- **Questionnaires**
- **Open discussion in the class room at the end of the lectures**

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- **Revision of student answer paper by another staff member.**
- **Analysis the grades of students.**

##### 3. Processes for Improvement of Teaching

- **Preparing the course as PPT.**
- **Using scientific movies.**
- **Coupling the theoretical part with laboratory part**
- **Periodical revision of course content.**

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- **After the agreement of Department and Faculty administrations**

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodical revision by Quality Assurance Units in the Department and institution**

Faculty member responsible for the course:

Prepared by faculty staff: <b>1.Prof. Gamal Osman.</b> <b>2.Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:

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(7)- Food Microbiology 4014421-3

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology
<b>A Course Identification and General Information</b>
24. Course title <b>Food and Dairy Microbiology</b>
25. Course code: <b>4014421-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
26. Name of faculty member responsible for the course: Associate
27. <b>Prof. Dr. Khaled Elbanna</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 6</b>
6. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3) / Microbial physiology (4012452-3).</b>
7. Co-requisites for this course (if any): ---
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

The major objective of the course is to give foundation knowledge in the study of food

microbiology to students. It is expected that, at the end of the course, students will be able to:

- obtain a basic understanding of the microbial phenomena occurring in food products.
- will become familiar with the laboratory methods used in the microbiological analysis of foods, and with the identifying characteristics of the major groups of microorganisms associated with food spoilage, foodborne disease, and food fermentations.
- Isolate and Identify different types of microorganisms and describe the advantages and disadvantages of microorganisms as they affect food and food products
- Have a knowledge about the method for food preservations
- Explain the various activities of microorganisms as they relate to food spoilage and food poisoning, food processing and preservation.
- Explain methods of control and eradication of food poisoning
- Manipulate and control microorganisms in product development.
- The students are practically trained in microbiological analysis by performing analysis on several food products for different microbial parameters. By means of the practical work, an insight is created in the factors influencing the microbial ecology of food products.

**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This is a compulsory course. Students will be exposed to problems of microorganisms in food processing, preservation and storage. The course will

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highlight basically various method of manipulating and control of food microorganisms. This will include the advantages of microorganisms in Food processing and product development. Furthermore, concepts of food spoilage, food poisoning and microbial hazard will be treated. The course will expose students to practical lessons that are relevant to the basic concepts of the implication of microorganisms in food processing, preservation and storage.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction and history of food microbiology ❖ Positive and negative roles of the microorganisms in food and dairy products	1	2
❖ Food and dairy microorganisms	1	2
❖ Microbial contamination of raw material, Contamination of various foods ,Sources of contamination	1	2
❖ Food spoilage: - the factors responsible for food spoilage - spoilage of some specific foods (Milk products, cereals, canned foods, vegetables. - Factors affecting growth of Microorganism (the factors that affect the growth of microorganisms and how they can be controlled.	3	6
❖ Principles and the methods for food preservation: ❖ Methods of Food Processing, Preservation and Storage (To describe the various methods of processing and preservation techniques used in enhancing the quality and storability of foods)	4	8
❖ Food poisoning: - Types of food poisoning, - Bacterial food poisoning. - Indicator microorganisms for food quality and safety - Foods with Greatest Risk (foods with greatest risk to food poisoning and reasons for their susceptibility) - Diseases caused from contaminated foods	2	4
❖ New technology for developing the Food Products: by using natural microbial products such as Nisin, Bacteriocin-like substances, using single cell protein from microorganisms.	2	4
	14 weeks	28hrs

2 Course components (total contact hours per semester):			
Lecture : 28	Tutorial:	Practical: 42	Other:

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

**For each of the domains of learning shown below indicate:**

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

**f. Knowledge : Description of the knowledge to be acquired**

**Upon successful completion of this course The student:**

- **will be aware with the basic information of food microbiology.**
- **will be understand the positive and negative roles of microorganisms in food and dairy products**
- **will become familiar with the laboratory methods used in the microbiological analysis of foods, and with the identifying characteristics of the major groups of microorganisms associated with food spoilage, foodborne disease, and food fermentations.**
- **Have a knowledge about the method for food preservations**
- **Could enumerate types of the microbial food poisoning**
- **will be familiar with the role of microorganisms in food spoilage.**
- **mention the groups of organisms are associated with bread, fruits and dried foods spoilage**

**(ii) Teaching strategies to be used to develop that knowledge**

- **The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to investigate different food products in the laboratory.**
- **At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.**
- **All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.**
- **Using images and movies**
- **Studying food microorganisms specimens in lab.**
- **Encouraging student to collect the new information about different important microorganisms in food.**
- **Enable the reference books and scientific sites concerning food microorganisms in internet.**

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

#### b. Cognitive Skills

##### (i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

- thinking and give information about the taxonomy of microorganisms that play an important roles in food and dairy
- give information about the role of microorganisms in food and dairy products.
- Explain the why the fresh and vegetable foods will rapidly spoilage than the dried food?
- mention the common changes observed with spoilage of fruits and vegetables
- discuss the problem of Food Poisoning
- mention the common chemicals that can cause Food poisoning and how can these be prevented?
- discuss the common food items associated with biological Food poisoning
- describe the common symptoms of food poisoning generally
- mention the types of microorganisms associated with milk contamination

##### (ii) Teaching strategies to be used to develop these cognitive skills:

- Through lectures, videos and some laboratory experiments which introduced to the students to enable them to :
- differentiate between chemical and Bacterial Food poisoning.
- mention what are the best methods of preventing contamination of fast food products.

##### (iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

#### c. Interpersonal Skills and Responsibility

##### (x) Description of the interpersonal skills and capacity to carry responsibility to be developed

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

##### (xi) Teaching strategies to be used to develop these skills and abilities

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

##### (iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.

**d. Communication, Information Technology and Numerical Skills**

- (xix) Description of the skills to be developed in this domain.
- Enhancing the ability of students to use computers and internet.
- (xx) Teaching strategies to be used to develop these skills
- Homework (preparing a report on some topics related to the course depending on web sites).
- (iii) Methods of assessment of students numerical and communication skills
- Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

**Description of the psychomotor skills to be developed and the level of performance required**

Upon successful completion of this course, the student is expected to be able to:

- Practice the basic Lab. Skills
- Use light microscope in accuracy.
- Prepare microscopic slides and culture media.
- Use aseptic technique to properly handle microorganisms;
- Stain microorganisms using the Gram stain;
- Inoculate and isolate bacteria;
- Analyze the food samples for the presence of pathogen microorganisms
- Prepare fermented food using microorganisms

**(ii) Teaching strategies to be used to develop these skills**

- Follow up students during preparing slides, examination and isolation. Food sample preparation

**(xxi) Methods of assessment of students psychomotor skills**

- Giving additional marks for preparing the best slide and correct prepared culture media, isolate and identify the important microorganisms that playing an important role in food and dairy products

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%



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#### D. Student Support

**10. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

#### E. Learning Resources

##### Required Text(s):

- **James M. Jay (2000). Modern Food Microbiology (6th ed.) (Aspen food science text series) Includes bibliographical references and index. ISBN 0-8342-1671-X. AN ASPEN PUBLICATION® Aspen Publishers, Inc. Gaithersburg, Maryland**
- **Adegoke, G.O. (2004). Understanding Food Microbiology. 2nd edition. Ventures.**

##### Recommended Reading List

**Ayres, J.C., Mundt, J.O. and Sandine, W. E. (1980). Microbiology of Foods. W.H. Freeman & Company, San Francisco. ISBN 0-7167-1049-8. Pg 44-69.**

**Nester, E.W., Anderson, D.F., Roberts, Jr, C.E., Pearsall, N.N. and Nester, M.T. (2004). Microbiology, A human Perspective. 4th edition. McGraw Hill Company, New York. Pp 245-341. ISBN 0-072473827.**

**Betty, C.H. (1974). Food poisoning & food Hygiene 3rd edition. William Clowes & Son Ltd, London. Pp 3-12. ISBN 0-7131-42170.**

**Fox, B.A and Cameron, A.G. (1992). Food Science, Nutrition and Health. 5th edition. Edward Arnold, London pp 330-312. ISBN 0-340-49675-4.**

**Gaman, P.M & Sherrington, (1996). The science of food. 3rd edition. Read Education and Professional Publishing Ltd. pp 177-84. ISBN 0-7506-2957-6.**

**Ihekoronye, I.A. and Ngoddy, P.O (1985). Integrated Food Science and Technology for the Tropics. Macmillan Publisher, London. Pp 106-108. ISBN- 0-333-38883-6**

**Arcbuckle W.S. (1986). Ice Cream. A publishing Company U.K 5th edition. Gaffa, T.; Jideani I.A and Nkama, I. (2002). Traditional Production, Consumption and Storage of kunu-anon-alcoholic cereal beverage. Plant Food Human Nutrition 57:73-81**



Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by Associate prof. Dr. Khaled Elbanna.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

##### 2. Computing resources

- Providing class rooms with computers and labs with data show.

##### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial and fungal slides
- Availability of some reference bacterial strains
- Availability new light microscopes
- Availability different specific media and chemicals used for isolation.
- Availability of some material and instruments used for preparation some foods

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

##### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

Faculty member responsible for the course:

Prepared by faculty staff: <b>1. Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04. 2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean .	Signature:
Date:	

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**(8)- Industrial Microbiology 4014441-4**

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology</b>
<b>A Course Identification and General Information</b>
28. Course title <b>Industrial Microbiology</b> 29. Course code: <b>4014441-4</b>
2. Credit hours: <b>4hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
30. Name of faculty member responsible for the course: <b>Dr. Abdelrahman Assaeedi.</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 7</b>
6. Pre-requisites for this course (if any): <b>Microbial Physiology (4012452-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

After completing this course the student should be able to:

- ❖ describe the main steps and processes used to produce biological products in industry.
- ❖ List several present day applications of genetic engineering in industrial microbiology and biotechnology.
- ❖ discover new useful microorganisms, improve their production of useful products and store them reliably for later use.
- ❖ produce the desired microorganism containing a product on an industrial scale, including the choice of carbon source and other nutrients and the factors that influence this
- ❖ use batch, fed-batch and continuous culture fermentation and monitor relevant parameters, e.g. oxygen, pH, heat, CO<sub>2</sub>, OD.
- ❖ decide which techniques are applicable in bioprocessing particular products, e.g. alcohols, organic and amino acids, polymers, vaccines, proteins, secondary metabolites (including antibiotics, insecticides etc.)
- ❖ understand ethical issues in production microbiology, such as standards of laboratory and in-plant behaviour and etiquette
- ❖ understand commercial issues in production microbiology, such as confidentiality of information and the need for licensing, e.g. Good Manufacturing Practice
- ❖ perform microbiological investigations, observe, evaluate and Interpret the data obtained, report the findings accurately and precisely
- ❖ work cooperatively with a small group of peers
- ❖ developing a new product on a large-scale commercial basis.

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course aims to enable the students to enter industry with an appropriate level of understanding of the need for both science and business aspects to be achievable to make a viable product. The course will help the students to develop their ability to

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apply the techniques used in the different phases of industrial microbiology. These include:

- a. Discovery, production (including fermentation and scale-up), bioprocessing and cell banking.
- b. Principles and practices in the main applications of micro-organisms to the industrial production of foods, pure chemicals, proteins and other useful products, including the use of genetically modified organisms.

Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ Introduction: to Industrial Microbiology:</b> - History and Scope of Industrial Microbiology - Growth of Industrial fermentations; -The Chronological development of Fermentation industry. -Strain Isolation and screening	1	2
<b>❖ Microbial fermentations:</b> - Definition of Microbial fermentation Exploitation of microorganisms and their products, screening, strain development strategies, immobilization methods, fermentation media, raw material used in media production, antifoaming agents, buffers, downstream processing. - Types of Fermentations: - Alcohol -Glycerin - Mixed acids (Citric acid, Fumaric acid, Gluconic acid, Acetic acid) - Glycerin -Acton -Butanol - Lactic acid etc. -Biofuels: ethanol, methane, biogas. -Fermentation equipment and its uses, fermentor design, Types of fermentors and fermentations- single, batch, continuous, multiple, surface, submerged and solid state.	3	6
<b>❖ Production of Antibiotics:</b> -Study of production processes for various classes of low molecular weight secondary metabolites: Antibiotics- beta-lactams (Penicillin), semi synthetic Pencillins and Cephalosporins amino-glycosides (streptomycin), macrolids (erythromycin) and quinines.	1	2

<p>❖ <b>Production of Microbial Enzymes:</b> Enzymes and their classification, Enzymes purification methods. -Proteases, Amylases Lipases, Cellulases, Pectinases, Isomerases and other commercially important. Enzymes for the food pharmaceutical industries. -Enzymes downstream processing (recovery and purification) - Enzyme kinetics, factors affecting rates of enzyme mediated reactions (pH, temperature, substrate concentration, enzyme concentration and reaction time). -Derivation of Michaelis -Menton equation and its significance in enzyme kinetic studies. Enzyme inhibitors and regulation.</p>	3	6
<p>❖ <b>Production of Vitamins</b> -Production of B2, B12 and bet carotene: -Microorganisms produced vitamin B12:(<i>Propionibacterium freudenreichi</i>, <i>Pseudomonas denitrificans</i>, <i>Streptomyces olivaceus</i>). -pathway for vitamin biosynthesis -Fermentation process (upstream processing) -Downstream processing of vitamin B12 (recovery and purification) - Problems associated with the production of vitamin B12.</p>	1	2
<p>❖ <b>Production of Amino acids</b> - Uses of amino acids in industrial applications - Microbial production of amino acids. -Strains produced glutamic acid (such <i>Corynebacterium glutamicum</i>, <i>Brevibacterium flavum</i>, and <i>Brevibacterium lactofermentum</i>) -Glutamic acid biosynthesis pathway. -Fermentation process for L-glutamic acid production (Upstream processing) -Downstream of glutamic acid production (purification and recovery). -Methods for separation of amino acids (Centrifugation, Filtration, Crystallization, Ion exchange chromatography, Solvent extraction, Evaporation) -Factors influencing glutamic acid production.</p>	1	2
<p>❖ <b>Microbial production of vaccins:</b> -Define vaccine -Types of Vaccines and Their Characteristics (Vaccines Used to Prevent Bacterial Diseases, Vaccines Used to Prevent Viral Diseases). -Development of New Vaccines -Conventional antibody production (Antibody production , Polyclonal antibodies, Monoclonal antibodies)</p>	2	4

<b>❖ Introduction in Genetic engineering and their application in biotechnology</b> - mean of genetic engineering -Applications of genetic engineering - general techniques used by genetic engineers to modify DNA Recombinant DNA Technology Restriction Enzymes Cloning Genes in Recombinant Plasmids Genomic Library Reverse transcriptase Mass-Produced Gene Products	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical: 42	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
12h (reports & essay)

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**g. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course The student will be able to:

1. familiarized with industrial application of microorganisms
2. Define basic concepts of industrial microbiology
3. Distinguish between upstream and Downstream for any microbial products
4. List the valuable microbial products
5. Define types of membrane transport for nutrient uptake and protein excretion.
6. Describe fermentation process for any microbial products
7. Outline Genetic engineering and their application in biotechnology.

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- At the end of the programme, students will be divided into groups for

seminar presentation on important areas of the course to assess their understanding and comprehension of the course.

- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information in industrial microbiology and the new microbial products.
- Make the reference books and scientific sites concerning the industrial microbiology in internet available for the students.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

1. Estimate the capability of different microorganisms to produce valuable product
2. Explain why the aeration process (oxygen) and pH are very important during fermentation process.
3. Summarize the role of the genetic engineering in industrial microbiology and biotechnology
4. Write briefly about the factors influence the fermentation process of any microbial product
5. Compare between production of the enzyme from microorganisms and the higher organisms (plants or animals)
6. Diagram the gene cloning steps of interesting gene
7. Calculate the amount of the final products from fermentation batch
8. Differentiate between batch fermentation and fed batch fermentation
9. Analyse and interpret the fermentation data for any product
10. Design new and cheap media for fermentation any product

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

- At the end of the course, the student will be able to:  
-demonstrate the fermentation process of any microbial products  
-analyze the growth kinetic data.

<p>-use different fermenters for production any microbial product</p> <p>-write briefly report about production any microbial products</p> <p>-work in team</p> <p>(xii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> <li>- Lab work</li> <li>- Case Study</li> <li>- Active learning</li> <li>- Small group discussion</li> </ul> <p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team</li> <li>• Evaluation of the role of each student in lab group assignment</li> <li>• Evaluation of students presentations</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p> <p>(xxii) Description of the skills to be developed in this domain.</p> <p>At the end of the course, the students</p> <ul style="list-style-type: none"> <li>- will gain experience in effective communication skills by practicing, listening, reading, writing and speaking clearly.</li> <li>- short oral presentations of 5-8 minutes will be required of all students and will be given during a class period. Students will pick a microbial biotechnology topic and discuss specific issues related to the topic.</li> </ul> <p>(xxiii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>• Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>• Seminars presentation</li> <li>• Practical during carryout the experiments in the lab.</li> </ul> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> <li>- Evaluation of presentations</li> <li>- Evaluation of reports</li> <li>- Practical exam</li> </ul>
<p><b>e. Psychomotor Skills (if applicable)</b></p> <p>At the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>- demonstrate any experiment for production any microbial products</li> <li>- Perform any technique used in fermentation process</li> <li>-operate any device in the biotechnology lab</li> </ul>
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>- Follow up students the students in lab and during carryout all the laboratory experiments</li> </ul>
<p>(xxiv) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>• Giving additional marks for the students they have accurate laboratory results and good seminar presentation</li> </ul>

- **Practical exam.**

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	<b>Periodical Exam (s)</b>	<b>4</b>	<b>15 min</b>	<b>10 %</b>
2	<b>Mid Term Exam (Theoretic)</b>	<b>8</b>	<b>60 min</b>	<b>20 %</b>
3	<b>Mid Term Exam (practical)</b>	<b>9</b>	<b>30 min</b>	<b>10 %</b>
4	<b>Reports and essay</b>	<b>11</b>	<b>--</b>	<b>5 %</b>
5	<b>Final Practical Exam</b>	<b>15</b>	<b>60 min</b>	<b>15 %</b>
6	<b>Final Exam</b>	<b>16</b>	<b>120 min</b>	<b>40 %</b>
<b>Total Marks</b>				<b>100%</b>

#### D. Student Support

**11. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

#### E. Learning Resources

##### Required Text(s):

**1- Industrial Microbiology: An Introduction by Waites, Morgan, Rockey and Higton, Blackwell Science (2001)**

##### Recommended Reading List

- 1- Brock biology of microorganism, 11<sup>th</sup> edition, By Madigan, Michael and Martinko, John, (2005)**
- 2- Elements of Chemical Reaction and Engineering, 4<sup>th</sup> edition, by H. Scott Fogler Pearson Education Inc., (2006).**
- 3. Any biotechnology, applied microbiology and microbial biotechnology journal will be of great benefits to the student for their assignment.**

**Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)**  
**[www. Prenhall.com/madigan](http://www.Prenhall.com/madigan)**

**Other learning material such as computer-based programs/CD, professional standards/regulations**

- **PPT prepared by Dr. Abdelrahman Asaedii.**

#### F. Facilities Required

**Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)**

**1. Accommodation (Lecture rooms, laboratories, etc.)**

- **Class room is already provided with data show**

- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
- 2. Computing resources
  - Providing class rooms with computers and labs with data show.
- 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - Availability of some bacterial and fungal strains used in fermentation lab
  - Availability different specific media and chemicals used for fermentations

#### Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - Questionnaires
  - Open discussion in the class room at the end of the lectures
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - Revision of student answer paper by another staff member.
  - Analysis the grades of students.
3. Processes for Improvement of Teaching
  - Preparing the course as PPT.
  - Using scientific movies.
  - Coupling the theoretical part with laboratory part
  - Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
  - After the agreement of Department and Faculty administrations.
- 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
  - Periodical revision by Quality Assurance Units in the Department and institution.

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Abdulrahman S. Assaedi. 2. Dr. Khaled Elbanna.	Signature:
Date Report Completed: 1.04. 2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	



**(9)- Petroleum Microbiology and Bioremediation 4014412-3**

<b>Institution: UM AL – QURA UNIVERSITY</b>
<b>College/Department : Faculty of Applied Science – Department of Biology</b>
<b>A Course Identification and General Information</b>
17. Course title <b>Petroleum Microbiology and Bioremediation</b>
18. Course code: <b>4014411-3</b>
19. Credit hours: <b>3hrs</b>
20. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
21. Name of faculty member responsible for the course: <b>Dr. Hussien Hassan Abulreesh (<a href="mailto:hhabulreesh@uqu.edu.sa">hhabulreesh@uqu.edu.sa</a>).</b>
22. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 7</b>
23. Pre-requisites for this course (if any): <b>Organic Chemistry (4022301-4) / Microbial Physiology (4012452-3) / Bacteriology (4012422-3).</b>
24. Co-requisites for this course (if any):
25. Location if not on main campus: <b>Main campus.</b>
<b>B Objectives:</b>
<p>❖ After completing this course student should be able to:</p> <ol style="list-style-type: none"> <li>1. list the paraffinic and aromatic components of different kinds of crude oil.</li> <li>2. discuss the formation of petroleum from fossils and microfossils.</li> <li>3. discuss the Origins and distribution of petroleum in the environment</li> <li>4. summarize physical, chemical and biological factors affecting petroleum degradation.</li> <li>5. list bacteria that attack metals and cause rusting of oil pipes.</li> <li>6. describe the roles of microorganisms in bioexploration.</li> <li>7. - explain microbial aspects and indicators of oil prospecting.</li> <li>8. -differentiate between biodegradation, bioremediation.</li> <li>9. use the microorganisms in oil clean-up operations; oil spillage.</li> <li>10. - write the roles of microorganisms in biodegradation, bioremediation or cleanup during oil pollution.</li> <li>11. -predict the degradation products of crude oil</li> <li>12. - explain the role of microorganisms in corrosion of oil field equipment.</li> <li>13. -diagram the microbial metabolism of hydrocarbons aliphatic and cyclic aromatic hydrocarbons under anaerobic and aerobic conditions</li> <li>14. identify the Methane-utilizing bacteria (methanotrophs)</li> <li>15. write Biotechnology and enhanced crude oil recovery</li> <li>16. summarize the role Sulphate reducing bacteria and its role in crude oil recovery process .</li> </ol>
<b>C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):</b>

This course explores microbial activities related to petroleum, microbial metabolism of hydrocarbons aliphatic and cyclic aromatic hydrocarbons under anaerobic and aerobic conditions. Also, this course will be covered



physical, chemical and biological factors affecting petroleum degradation. Microbial degradation of petroleum products and use of microorganisms in oil clean-up operations; oil spillage. By the end of the semester, students are provided with knowledge on microbial activities and their applications in microbial enhanced oil recovery, microbial indicators in oil prospecting.

<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
❖ <b>General Introduction:</b> - General introduction about petroleum Microbiology -An overview about composition and nature of crude oil around the world. - <b>Origins and distribution of petroleum</b>	<b>1</b>	<b>2</b>
❖ <b>Biological origin and accumulation of petroleum from microfossils and sedimentary basis.</b> - <b>Microbial aspects of oil prospecting</b>	<b>1</b>	<b>2</b>
❖ <b>Microbial metabolism of aliphatic hydrocarbons (straight and branched chains) under aerobic and anaerobic conditions</b>	<b>2</b>	<b>4</b>
❖ <b>Microbial metabolism of hydrocarbons aliphatic and cyclic aromatic hydrocarbons under anaerobic and aerobic conditions</b>	<b>3</b>	<b>6</b>
❖ <b>Methane-utilizing bacteria (methanotrophs) microbial metabolism of methane</b>	<b>1</b>	<b>2</b>
❖ <b>Taxonomy of methane producing bacteria</b> <b>Identification, Nomenclature, classification of methane producing bacteria</b>	<b>1</b>	<b>2</b>
❖ <b>Biotechnology and crude oil recovery</b> - Microbial enhanced crude oil recovery ❖ <b>Sulphate reducing bacteria and its role in crude oil recovery process .</b>	<b>1</b>	<b>2</b>
❖ <b>Biodegradation of crude oil</b> -Microbial degradation of petroleum products and use of microorganisms in oil clean-up operations; oil spillage. - Isolation of methane producing bacteria -Identification and characterization (phenotypic and genotypic characterization -Growth of crude oil degrading bacteria on the monomer of petroleum compounds. -Determination of crude oil degradation products by GC Mass	<b>2</b>	<b>4</b>
❖ <b>Biodegradation of petroleum derivatives:</b> <b>Isolation and characterization of Diesel, Benzene and Oil degrading bacteria</b>	<b>1</b>	<b>2</b>

❖ Role of microorganisms in corrosion of oil field Equipment Hydrocarbonoclastic bacteria; Metallomonas bacteria that cause rusting of oil pipes;	1	2
	14 weeks	28hrs

2 Course components (total contact hours per semester):

Lecture : 28	Tutorial:	Practical: 42	Other:
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3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay).

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

##### h. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course, the student will be able to:

1. list the paraffinic and aromatic components of different kinds of crude oil.
2. describe the formation of petroleum from fossils and microfossils.
3. outline the origins and distribution of petroleum in the environment
4. summarize physical, chemical and biological factors affecting petroleum degradation.
5. write the role of Biotechnology for enhancing crude oil recovery
6. write the roles of biotechnology in biodegradation, bioremediation or cleanup during oil pollution.
7. list bacteria that attack metals and cause rusting of oil pipes.
8. memorize the roles of microorganisms in bioexploration.
9. List crude oil degrading microorganisms and oil clean-up operations; oil spillage.
10. –describe the microbial metabolism of hydrocarbons aliphatic and cyclic aromatic hydrocarbons under anaerobic and aerobic conditions
11. identify the Methane-utilizing bacteria (methanotrophs)

##### (ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer,

seminar presentation by the students and web-interactions.

- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in petroleum microbiology.
- Make the reference books and scientific sites concerning petroleum microbiology in internet available.

(iii) Methods of assessment of knowledge acquired:

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1. list the paraffinic and aromatic components of different kinds of crude oil.
2. Interpret formation of petroleum from fossils and microfossils.
3. discuss the Origins and distribution of petroleum in the environment
4. summarize physical, chemical and biological factors affecting petroleum degradation. .
5. - describe the microbial aspects and indicators of oil bioexploration and prospecting
6. differentiate between biodegradation, bioremediation.
7. write the roles of microorganisms in cleanup during oil pollution.
8. -predict the degradation products of crude oil
9. - explain the role of microorganisms in corrosion of oil field equipment.
10. -diagram the microbial metabolism of hydrocarbons aliphatic and cyclic aromatic hydrocarbons under anaerobic and aerobic conditions
11. identify the Methane-utilizing bacteria (methanotrophs)
12. write Biotechnology and enhanced crude oil recovery
13. summarize the role of Sulphate reducing bacteria and its role in crude oil recovery process.
14. characterize and identify the microorganisms responsible for degradation of crude oil and its degradation products.
15. Estimate the potentiality of the microorganisms in crude oil degradation

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

**At the end of the course, the student will be able to:**

- 8. Use of needed precautions when dealing with new isolated microbes
- 9. Modify the medium used for isolation any microbe responsible for crude degradation.
- 10. Choose the suitable media and method for crude oil or its derivatives from any habitats
- 11. Demonstrate professional attitudes and behaviors towards others.

**(xiii) Teaching strategies to be used to develop these skills and abilities**

- Lab work
- Case Study
- Active learning
- Small group discussion

**(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

**d. Communication, Information Technology and Numerical Skills**

**(xxv) Description of the skills to be developed in this domain.**

At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.
- Interpret the laboratory data
- Know how to write a report.

**(xxvi) Teaching strategies to be used to develop these skills**

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.

**(iii) Methods of assessment of students numerical and communication skills**

- 1- Evaluation of presentations
- 2- Evaluation of reports
- 3- Practical exam

**e. Psychomotor Skills (if applicable)**

At the end of the course, the student will be able to:

- 1-perform the laboratory experiments precisely

2-operate all devices in petroleum microbiology lab 3- draw the pathway of the crude oil degradation 4. analyse any data obtained from the lab experiments
(ii) Teaching strategies to be used to develop these skills - Follow up students the students in lab and during carryout all the laboratory experiments
(xxvii) Methods of assessment of students psychomotor skills <ul style="list-style-type: none"> <li>Giving additional marks for the students they have accurate laboratory results and good seminar presentation</li> <li>Practical exam.</li> </ul>

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

12. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

(1)- Ollivier, B. and Magot, M. (2005) *Petroleum Microbiology*. ASM Press, Washington DC, USA.

(2)- Atlas, RM, and Philp, J. (2005) *Bioremediation: Applied Microbial Solutions for Real-World Environmental Cleanup*. ASM Press, Washington DC, USA.

##### Recommended Reading List

Ernest Beerstecher Jr. (2013) *Petroleum Microbiology: An Introduction to Microbiological Petroleum Engineering*.

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC309048/>

Other learning material such as computer-based programs/CD, professional standards/regulations

Book note prepared by Associate professor Dr. Hussien Hassan Abulreesh

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#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

##### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

##### 2. Computing resources

- Providing class rooms with computers and labs with data show.

##### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference crude oil degrading strains
- Availability all kits for identification of the microorganisms isolated from different habitats
- Availability of GC mass device for rapid identification of degradation products of crude oil and its derivatives

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionaries
- Open discussion in the class room at the end of the lectures

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

##### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

Faculty member responsible for the course:

Prepared by faculty staff: 1. <b>Dr. Hussien Hassan Abulreesh.</b> 2. <b>Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: 1. <b>Dr. Khaled Elbanna.</b> 2. <b>Dr. Hussein H. Abulreesh.</b> 3. <b>Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(10)- Cyanobacteria 4014431-3

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology
<b>A Course Identification and General Information</b>
31. Course title <b>Cyanobacteria</b> 32. Course code: <b>4014431-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
33. Name of faculty member responsible for the course: <b>Prof. Khaled Jamal Allayl</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 7</b>
6. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

## B Objectives

After completing this course student should be able to:

1. List the role of cyanobacteria in the environment
2. Define basic structures and shapes of the different genera of cyanobacteria.
3. Differentiate between the fine structure of cyanobacteria and other bacteria and algae.
5. identify and recognize the genera of cyanobacteria
4. Recognize the biotechnological important of cyanobacteria in biodiesel, cyanophycin production and as biofertilizers in rice fields
5. Distinguish between the different genera of cyanobacteria.
6. Describe the modern methods for identification of cyanobacteria
7. Discuss the nutrition requirements of cyanobacteria.
8. Understand the metabolism in cyanobacteria
9. Describe the reproduction in cyanobacteria
10. define the cyanotoxins and describe its properties.
11. Describe the spring blooming phenomena in cyanobacteria

## C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course deals with the occurrence and the role of cyanobacteria in the environment, Cyanobacteria cell structure, classification of cyanobacteria based on morphological, physiological and genetic characterization. Methods and approaches for the isolation and identification of cyanobacteria are considered in the laboratory. Study the factors effect of cyanobacterial growth, nutrition and reproduction of the cyanobacteria. Also, study the cyanobacterial toxins. Important of cyanobacteria in biotechnology for biofuel and cyanophycin production.

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<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
<b>❖ A brief history about the cyanobacteria including:</b> -Role of cyanobacteria in environment -Historical Taxonomy of cyanobacteria -Scientific terms in cyanobacteria -Similarities and differences between cyanobacteria, other groups of bacteria and algae -Economic importance of cyanobacteria	<b>1</b>	<b>2</b>
<b>❖ General characteristics of cyanobacteria:</b> -Cell structure of cyanobacteria -Pigments of cyanobacteria -Motility of cyanobacteria -Morphology of cyanobacteria	<b>1</b>	<b>2</b>
<b>❖ Reproduction in cyanobacteria:</b> -Vegetative reproduction (Binary fission, Fragmentation, Hormogonia) -Asexual reproduction (Endospores, Nanospores Naninocytes, Akinetes, Heterocyst) -Sexual Reproduction	<b>1</b>	<b>6</b>
<b>❖ Taxonomy of cyanobacteria:</b> - Nomenclature of cyanobacteria - Identification - Classification - Morphological characteristics - Phenotypic and Genotypic of cyanobacteria - Cyanobacteria taxonomy in Bergey's Manual of determinative Bacteriology -Cyanobacteria taxonomy in Bergey's Manual of Systematic Bacteriology		
<b>❖ Characteristics and taxonomy of cyanobacterial orders.</b> In this section the students will be study the detailed about general characteristics and taxonomy of each order including the important families, genera and species related to each genus. - Chroococcales : - Oscillatoriales - Nostocales - Stigonematales - Pleurocapsales - Rivulariales	<b>5</b>	<b>10</b>

❖ <b>Metabolism in cyanobacteria:</b> - <b>Important definition:</b> (Metabolism, Catabolism, Anabolism) - <b>Energy Metabolism in Cyanobacteria</b> - <b>Photosynthesis in cyanobacteria</b> - <b>The difference between the photosynthesis in cyanobacteria (Oxygenic) and Anoxygenic phototrophic bacteria.</b> - <b>Respiratory metabolism in cyanobacteria</b> - <b>Chemotrophic synthesis in cyanobacteria.</b>	1	2
❖ <b>Biological nitrogen fixation in cyanobacteria</b> - <b>Nitrogenase structure in cyanobacteria</b> - <b>Types of cyanobacteria capable to fix atmospheric nitrogen;</b> - <b>Filamentous forming heterocyst fixing nitrogen</b> ( <i>Nostoc</i> , <i>Anabaena</i> , <i>Tolypothrix</i> , <i>Calothrix</i> , <i>Aulosira</i> ). - <b>Non heterocyst Filamentous cyanobacteria fixing nitrogen</b> ( <i>Oscillatoria</i> , <i>Plectonema</i> , <i>Scytonema</i> ) - <b>Mono cells fixing nitrogen</b> ( <i>Gloeocapsa</i> )	2	4
❖ <b>Factors effect on cyanobacteria</b> - <b>Moisture, Oxygen, light, elements, vitamins requirements, Effect of herbicides and pesticides on cyanobacteria</b>	1	2
❖ <b>Toxins of cyanobacteria</b> - <b>Structure of cyanotoxins</b> - <b>Common Cyanotoxins:</b> (Hepatotoxin, Neurotoxin, Aplysiatoxin) - <b>General diagnostics of cyanotoxins</b> - <b>Methods for determination of cyanotoxins</b>	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay).**

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

##### i. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

1. list the role of cyanobacteria in the life and environment
2. recognize and classify of cyanobacteria l genera
2. describe the structures of cyanobacteria.
4. list the types of pigments in cyanobacteria
5. memorize the metabolism in cyanobacteria
6. write techniques for isolation and identification of cyanobacteria
7. list the different order, families, genera and species of cyanobacteria
8. describe the general characteristics of cyanobacteria
8. describe the reproduction in cyanobacteria
10. list the types of toxins produced from cyanobacteria
10. define the cyanotoxins and describe its properties.

##### (ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important cyanobacteria in the environment
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new cyanobacteria
- Availability of the reference books and scientific sites concerning cyanobacteria in internet.

##### (iii) Methods of assessment of knowledge acquired:

- Periodical exam (s) 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 10%
- Report and activity 5%
- Final practical exam 15%
- Final exam 40%

## b. Cognitive Skills

### (i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1. Explain the fine structure of cyanobacteria
2. Distinguish between the different genera of cyanobacteria.
3. Discuss mechanism of the nitrogen fixation on cyanobacteria
4. Interpret how cyanobacteria synthesis its energy.
5. explain why cyanobacteria do not need sugar as carbon source in its metabolism

### (ii) Teaching strategies to be used to develop these cognitive skills:

- Give the studies some guidance that enable them to understand the benefits of cyanobacteria in biofuel and other medical polymers such cyanophycin-
- Propose ideas how the students isolate new species from cyanobacteria
- Quiz and exams

### (iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Discussions after the lecture

## c. Interpersonal Skills and Responsibility

### (xiv) Description of the interpersonal skills and capacity to carry responsibility to be developed

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

### (xv) Teaching strategies to be used to develop these skills and abilities

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

### (iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team

## d. Communication, Information Technology and Numerical Skills

### (xxviii)Description of the skills to be developed in this domain.

- Enhancing the ability of students to use computers and internet.

### (xxix) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Field visits to factories

### (iii) Methods of assessment of students numerical and communication skills

- Evaluation the efforts of students in preparing the reports and referring

the references.

**e. Psychomotor Skills (if applicable)**

**Description of the psychomotor skills to be developed and the level of performance required**

Upon successful completion of this course, the student is expected to be able to:

- (1) Preparation the suitable medium for isolation and cultivation of cyanobacteria
- (2) Preparation of cyanobacterial slides and investigation by microscope

**(ii) Teaching strategies to be used to develop these skills**

- Follow up the students during Preparation the media , isolation and cultivation of bacteria
- preparation of the slides

**(xxx) Methods of assessment of students psychomotor skills**

- Giving additional marks for preparing correct media, bacterial slides , good seminar presentation

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

**D. Student Support**

**13. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

**E. Learning Resources**

**Required Text(s):**

- Book note prepared by prof. Dr. Khaled Jamlellel  
The Biology of Cyanobacteria. N .G.Carr abd B.A.Whitton Blakwell (1982).
- Brock Biology of Microorganisms, Twelfth edition by Madigan, Martinko, Dunlap and Clark; Publisher: Pearson Prentice-Hall, ISBN: 0132324601 (2008).

**Recommended Reading List**



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- 1-Prescott, L., Harley, J. and Klien, D. (2005). Microbiology, MacGraw
- 2-The Cyanobacteria . Rippka and others( 1979) Generic Assignments , strain histories and properties of pure culture of cyanbacteria
- 3-Toxic cyanbacteria in Water . 0Chorus and Bartram(edts) 1999.
- 4- Introduction to the Cyanobacteria, University of California, Berkeley 2006.

Electronic Materials, Web Sites

[WWW.Cyanosite.com](http://WWW.Cyanosite.com)

[WWW.Cyanonews.com](http://WWW.Cyanonews.com)

Other learning material such as computer-based programs/CD, professional standards/regulations

- **PPT prepared by prof. Dr. Khaled Jamal Allayl.**

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - **Class room is already provided with data show**
  - **The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.**
2. Computing resources
  - **Providing class rooms with computers and labs with data show.**
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - **Availability of some reference bacterial strains**
  - **Availability different specific media and chemicals used for isolation.**

#### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - **Questionaries**
  - **Open discussion in the class room at the end of the lectures**
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - **Revision of student answer paper by another staff member.**
  - **Analysis the grades of students.**
3. Processes for Improvement of Teaching
  - **Preparing the course as PPT.**
  - **Using scientific movies.**
  - **Coupling the theoretical part with laboratory part**
  - **Periodical revision of course content.**
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
  - **After the agreement of Department and Faculty administrations**
- 5 Describe the planning arrangements for periodically reviewing course



effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

Faculty member responsible for the course:

Prepared by faculty staff: <b>Prof. Khaled Jamal Allayl.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(11)- Soil Microbiology 4014492-3

<b>Institution: UM AL – QURA UNIVERSITY</b>
<b>College/Department : Faculty of Applied Science – Department of Biology</b>
<b>A Course Identification and General Information</b>
<b>34. Course title Soil Microbiology</b>
<b>35. Course code: 4014492-3</b>
<b>2. Credit hours: 3hrs</b>
<b>3. Program(s) in which the course is offered. : BSc Microbiology.</b>
<b>4. Name of faculty member responsible for the course: Associate Prof. Dr. Khaled Elbanna.</b>
<b>5. Level/year at which this course is offered: 4<sup>th</sup> Year / Level 8</b>
<b>6. Pre-requisites for this course (if any):, Bacteriology (4012422-3) / Mycology (4012432-3).</b>
<b>7. Co-requisites for this course (if any): ---</b>
<b>8. Location if not on main campus: Main campus.</b>
<b>B Objectives</b>
<p><b>-Upon successful completion of this course, the student should:</b></p> <ul style="list-style-type: none"> <li>❖ know the major types of organisms found in soils and be familiar with their classification based on physiological and taxonomic criteria</li> <li>❖ Know the positive and negative roles of the microorganisms in soil.</li> <li>❖ He should be aware with the microbial role in the transformation of the organic matter in the soil.</li> <li>❖ He should be aware with the microbial role in carbon, nitrogen, phosphorus, sulfur, and iron cycles in the soil.</li> <li>❖ He should understand the factors influencing presence of and activities of microorganisms in different soils.</li> <li>❖ He will be able to isolate and identify the microorganisms that contribute to the soil fertility such: <ul style="list-style-type: none"> <li>- Isolation and identification of Cellulose, starch, lignin, pectin-degrading bacteria</li> <li>- Isolation and identification of nitrifying bacterial.</li> <li>- Isolation and identification of Nitrogen fixing bacteria from plant nodules</li> <li>- Isolation of phosphate dissolving bacteria.</li> <li>- Isolation and identification of sulphur reducing and oxidizing bacteria</li> <li>- Isolation and identification iron reducing and oxidizing bacteria</li> </ul> </li> <li>❖ Also, he should be know the relationships between the microorganisms in soil as well as describe plant-microbe interactions especially rhizosphere, mycorrhizae and nitrogen fixation</li> <li>❖ be able to find, understand and interpret primary source materials on a variety of topics related to microbial communities and processes</li> <li>❖ He should be familiar with preparation of the inocula from the benefit microorganisms that suitable for each crop.</li> </ul>

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**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

- ❖ **Role of microorganisms in soil, Decomposition of organic residues in soils; Legume bacteriology; Transformations of sulphur, iron, manganese in soils, decomposition of pesticide. Biological nitrogen fixation: symbiosis (including grain legumes, trees, Azolla) and non symbiotic; Biochemistry of nitrogen fixation (symbiotic and non symbiotic), methods of measuring biological nitrogen fixation (BNF); Legume bacteriology, inoculation, mycorrhiza; Biochemistry of nitrification, denitrification and nitrate reduction; Biochemical transformation of phosphorus, sulphur, hydrocarbons and pesticides (including herbicides). Biochemical processes in the rhizosphere. Microbial relationships, plant- microb interaction, Biofertilizers, Preparation of Silage and compost.**

<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
❖ <b>History of soil microbiology, soil profile, weathering factors affect the soil formation,</b>	<b>1</b>	<b>2</b>
❖ <b>The role of soil microorganisms in soil fertility, positive and negative roles of the microorganisms in soil.</b>	<b>1</b>	<b>2</b>
❖ <b>Soil Macro and microflora: Bacteria, cyanobacteria, fungi, Actinomycetes, protozoa, viruses</b>		
❖ <b>Microbial role in the transformation of the organic matter in the soil.</b>	<b>1</b>	<b>2</b>
❖ <b>Carbon cycle. Degradation and mineralization of organic substances such cellulose, starch, hemicellulose, pectin, lignin .....etc</b>	<b>3</b>	<b>6</b>
❖ <b>Nitrogen cycle: -Ammonification - Nitrification. -Denitrification -Nitrate reduction -Biological Nitrogen fixation (symbiotic and non symbiotic). -Factors that affect nitrogen fixation in soil. -C/N ratio and its role in transformation of the organic matter in soil</b>	<b>4</b>	<b>8</b>
❖ <b>Phosphorus, sulfur, and iron cycles and the role of the microorganisms in transformation of mineral elements</b>	<b>2</b>	<b>4</b>
❖ <b>Microorganisms in the rhizospher and plant- microbe interaction</b>	<b>2</b>	<b>4</b>
❖ <b>Microbial relationships</b>		
❖ <b>Biofertilizers</b>		
❖ <b>Preperation of Silage and compost</b>		

<b>Total learning weeks and Contact hours</b>	<b>14 weeks</b>	<b>28hrs</b>
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<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

<b>4. Development of Learning Outcomes in Domains of Learning</b> <b>For each of the domains of learning shown below indicate:</b> <ul style="list-style-type: none"> <li>• <b>A brief summary of the knowledge or skill the course is intended to develop;</b></li> <li>• <b>A description of the teaching strategies to be used in the course to develop that knowledge or skill;</b></li> <li>• <b>The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</b></li> </ul>	
<b>j. Knowledge : Description of the knowledge to be acquired</b> <p>Upon successful completion of this course, the student:</p> <ul style="list-style-type: none"> <li>❖ <b>will understand the positive and negative roles of microorganisms in soil</b></li> <li>❖ <b>will understand the factors influencing presence of and activities of microorganisms in different soils</b></li> <li>❖ <b>will Have knowledge about degradation process of organic compounds in the soil by microorganisms.</b></li> <li>❖ <b>will be familiar with the role of microorganisms in elements transformations</b></li> <li>❖ <b>will be aware with the relationships between the microorganisms in soil as will as describe plant-microbe interactions.</b></li> </ul>	
<b>(ii) Teaching strategies to be used to develop that knowledge</b> <ul style="list-style-type: none"> <li>• <b>Lectures which must start with preliminary one showing course contents</b></li> <li>• <b>Using images and movies</b></li> <li>• <b>Studying soil microorganisms specimens in lab.</b></li> <li>• <b>Encouraging student to collect the new information about different important microorganisms in plant and soil.</b></li> <li>• <b>Enable the reference books and scientific sites concerning soil microorganisms in internet.</b></li> </ul>	
<b>(iii) Methods of assessment of knowledge acquired:</b> <ul style="list-style-type: none"> <li>• <b>Periodical exam and reports 10%</b></li> <li>• <b>Mid- term theoretical exam 20%</b></li> </ul>	

- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

#### **b. Cognitive Skills**

##### **(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

- thinking and give information about the taxonomy of microorganisms that play an important roles in soil
- give information about the role of microorganisms in soil.
- Explain the degradation process for the organic compounds in soil
- Understand the pathway for symbiotic and non- symbiotic nitrogen fixation
- Give the evidences for: why some microorganisms preferred to live in rhizophore aria and others do not preferred that?
- Explain the relationship between plant and microbe, microbe- microbe in soil.

##### **(ii) Teaching strategies to be used to develop these cognitive skills:**

- Through lectures, videos and some laboratory experiments which introduced to the students to enable them to understand how the microorganisms degrade the organic compounds
- Demonstrate the pathways for organic compounds decomposition , nitrogen fixation process.

##### **(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.

#### **c. Interpersonal Skills and Responsibility**

##### **(xvi) Description of the interpersonal skills and capacity to carry responsibility to be developed**

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

##### **(xvii) Teaching strategies to be used to develop these skills and abilities**

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

##### **(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.

#### **d. Communication, Information Technology and Numerical Skills**

(xxxi) Description of the skills to be developed in this domain.

- Enhancing the ability of students to use computers and internet.

(xxxii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).

(iii) Methods of assessment of students numerical and communication skills

- Evaluation the efforts of students in preparing the reports and referring the references.

e. Psychomotor Skills (if applicable)

Description of the psychomotor skills to be developed and the level of performance required

Students should be able to:

- Practice the basic Lab. Skills
- Use light microscope in accuracy.
- Prepare microscopic slides and culture media.

(ii) Teaching strategies to be used to develop these skills

- Follow up students during preparing slides, examination and isolation.

(xxxiii) Methods of assessment of students psychomotor skills

- Giving additional marks for preparing the best slide and correct prepared culture media, isolate and identify the important microorganisms that playing an important role in soil

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

14. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

Required Text(s):

- Course note and PPT prepared by faculty member responsible for the

**course: Associate Prof. Dr. Khaled Elbanna**

- **Recommended Books and Reference Material (Journals, Reports, etc)**
  4. **Paul, E. A. and Clark, F. E. (1989). Soil Microbiology and Biochemistry. Academic Press, Inc. San Diego: California 92101.**
  5. **Power, C. B. and Daginawala, H. F. (1991). General Microbiology Vol II. Himalaya Publishing House, "Ramdoot". Dr. Bhalerao mary, Girgaon, Bombay-400004.**
  6. **Martin Alexander (1977). Introduction to Soil Microbiology, second Edition. John Wiley and Sons, USA.**
  7. **Saad Zaky Mahmoud, Abdelwahab Abdelhafez, and Elsayy Mobark (1988). Soil Microbiology, Egyptian Anglo.**
  - **Saad Zaky Mahmoud (1988). Practical Applied Microbiology, Egyptian Anglo.**

**Other learning material such as computer-based programs/CD, professional standards/regulations**

- **PPT prepared by Associate prof. Dr. Khaled Elbanna**

#### **F. Facilities Required**

**Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)**

1. **Accommodation (Lecture rooms, laboratories, etc.)**
  - **Class room is already provided with data show**
  - **The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.**
2. **Computing resources**
  - **Providing class rooms with computers and labs with data show.**
3. **Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)**
  - **Availability of some reference bacterial and fungal slides**
  - **Availability of some reference bacterial strains**
  - **Availability new light microscopes**
  - **Availability different specific media and chemicals used for isolation ( List with the Head of the Department).**

#### **G Course Evaluation and Improvement Processes**

##### **1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching**

- **Questionaries**
- **Open discussion in the class room at the end of the lectures.**

##### **2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department**

- **Revision of student answer paper by another staff member.**
- **Analysis the grades of students.**

##### **3. Processes for Improvement of Teaching**

- **Preparing the course as PPT.**



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<ul style="list-style-type: none"> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations.</li> </ul>
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution.</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: <b>1. Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04. 2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean	Signature:
Date:	



(12)- Environmental Microbiology 4014472-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>
<b>A Course Identification and General Information</b>
26. Course title <b>Environmental Microbiology</b>
27. Course code: <b>4014472-3</b>
28. Credit hours: <b>3hrs</b>
29. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
30. Name of faculty member responsible for the course: <b>Dr. Hussien Hassan Abulreesh (hhabulreesh@uqu.edu.sa ).</b>
31. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level (8)</b>
32. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3) / Microbial Physiology (4012452-3).</b>
33. Co-requisites for this course (if any): <b>---</b>
34. Location if not on main campus: <b>Main campus.</b>

**B Objectives:**

- ❖ After completing this course student should be able to:
  1. Identify the main concepts of microbial ecology
  2. Discuss the applications and use of microbial power in the control of some environmental pollution and how it is applied to study and resolve environmental problems
  3. List the negative roles of microorganisms in the environment (Biodegradation of paints, - Biodegradation and concrete corrosion, Biodegradation and Metal corrosion )
  4. list the general characteristics of the different environments
  5. Discuss the effect of general characteristics of the different environments of its microflora.
  6. Explain the impacts of environmental factors on microbial activities.
  7. Explain how microorganisms can survive, spread, adaptive, resistant and tolerant in the extreme environments.
  8. Summarize the microbe-microbe interaction, microbe-plant interaction, microbe-animal interaction
  9. Differentiate between biodegradation and biodeterioration
  10. Identify the concept of of some environmental phenomena such: biomagnification, Eutrophication, Spring blooming, Self-purification.
  11. Describe the biodegradation process.
  12. Apply the scientific methods in environmental microbiology e.g. collection, isolation and investigation of microbial flora from various environments.
  13. List microorganisms in air, water, soil, extreme environment and man-made environment, its role and activities.
  14. Differentiate between the Ecosystems and Environments

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

Environmental microbiology is designed to introduce students to understand environmental concepts, principals and the world of microorganisms from the point-view of interaction

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and reaction of microbial impacts and role of microorganisms in the environment. Control and resolve environmental problems that affect our live. Characterized the microorganisms and their activities exists in air, water and soil environment in combination with factors that influencing their activity and development. Microbial community dynamics, Microbial habitats (air, soil, subsurface, freshwater, marine and the deep sea), Natural microbial communities with emphasis on biofilms, Also, it covered biodeterioration and biodegradation of the environmental pollutants. Microbial interactions: microbe-microbe interactions, plants as microbial habitats, animals as microbial habitats.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ General Introduction:</b> - An Historical Overview about the microbial ecology - Important expression in microbial ecology.	1	2
<b>❖ Microbial life in the environment: Mechanisms of adaptation, resistant and tolerant:</b> - Survival and spread of microorganism. - Mechanisms of adaptation, resistant and tolerant. - Microbes in the natural biomes - Microbes in extreme environments - Environment induced genetic and physiological adaptations in microbes. - Characteristic features of thermophiles, psychrophiles methanogens, methylotrophs, acidophiles, alkalophiles, halophiles and their survival strategies.		
<b>❖ Distribution of the microorganisms in the different environments:</b> <b>Microorganism in air</b> - The air as an environment of microorganism - Adaptation of microorganisms to the air environment - Biological aerosols - Investigation of microbiological air pollutions.	1	2
<b>❖ <u>Microorganism in terrestrial environment</u></b> - The characteristics of soil microorganisms - Factors affecting soil micro-flora - The role of microorganisms in organic metabolism- the carbon cycle. - The role of microorganisms in nitrogen processes in soil -the nitrogen cycle. - Symbiosis forms		
<b>❖ Microorganism in aquatic environment</b> - Water as microbial habitat - Polluted water organisms - Wastewater treatment and technology.		



❖ <b>Methods used for study of the microbial communities in the different environments:</b> - direct Microscope - culturing and plating methods -Determination of microbiological activity -PCR and molecular technique	2	4
❖ <b>Microbial interactions</b> • Microbe-Microbe interactions: (+ ve interaction –ve interactions): Neutralism, Commensalism, Symbiosis, Antagonisms, Prediction, Parasitism • Plant-Microbe interaction • Animal-Microbe interaction	2	4
❖ <b>Study of some Environmental problems caused by Microorganisms:</b> - Biodegradation of plane oil - Biodegradation of paints - Biodegradation and concrete corrosion - Biodegradation and Metal corrosion	2	4
❖ <b>Roles of microorganisms in biodegradation of some pollutants:</b> - Biodegradation of crude oil -Biodegradation of heavy metals -Biodegradation of petrochemical - Role of microorganisms in metals separation and purification	2	4
❖ <b>Biodegradation of chemical compounds that are very difficult to degrade.</b> - Biodegradation of synthetic polymers -Microbial degradation of <u>Xenobiotics</u> ( pesticides, insecticides)	1	2
❖ <b>Study of some environmental phenomena</b> - biomagnification - Eutrophication - Spring blooming Self-purification	1	2
❖ <b>Bioremediation and its roles in cleaning the environment:</b> - Definition of bioremediation -Bioremediation of oil contaminated soil - Bioremediation groundwater	1	2
❖ <b>Extreme Environments</b> - Survival and spread of microorganism. - Mechanisms of adaptation, resistant and tolerant. - Microbes in the natural biomes - Microbes in extreme environments - Environment induced genetic and physiological adaptations in microbes. - Characteristic features of thermophiles, psychrophiles methanogens, methylotrophs, acidophiles, alkalophiles, halophiles and their survival strategies.	1	2
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

**For each of the domains of learning shown below indicate:**

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

**k. Knowledge : Description of the knowledge to be acquired**

**Upon successful completion of this course The student will be able to:**

- 1. Identify the main concepts of microbial ecology**
- 2. List the positive and negative roles of microorganisms in the environment .**
- 3. list the general characteristics of the different environments**
- 4. describe the effect of general characteristics of the different environments of its microflora.**
- 5. Summarize the microbe-microbe interaction, microbe-plant interaction, microbe-animal interaction**
- 6. Differentiate between biodegradation and biodeterioration**
- 7. Identify the concept of of some environmental phenomena such: biomagnification, Eutrophication, Spring blooming, Self-purification.**
- 8. Describe the biodegradation process.**
- 9. List microorganisms in air, water, soil, extreme environment and man-made environment, its role and activities.**
- 10. Differentiate between the Ecosystems and Environments**
- 11. List levels of microbial ecological organization.**
- 12. Describe microbial communities.**
- 13. write microorganisms used in remediation technologies**
- 14. Recognize characteristics of soil microorganisms.**

**(ii) Teaching strategies to be used to develop that knowledge**

- **The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.**
- **At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.**
- **All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.**

- Using images and movies
- Encouraging students to collect the new information about what the new in microbial ecology.
- Availability of the reference books and scientific sites concerning microbial ecology

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

10. Explain microbial mechanisms of adaptation, resistant and tolerant in the environment.
11. Predict impacts of environmental factors on microbial activities.
12. Compare characteristic features of thermophiles, psychrophiles, methanogens, methylotrophs, acidophiles, alkalophiles, halophiles and their survival strategies.
13. Differentiate between bioremediation and biodegradation
14. Summarize scope and applications of environmental microbiology
15. List the negative roles of microorganisms in the environment (Biodegradation of paints, - Biodegradation and concrete corrosion, Biodegradation and Metal corrosion )
16. list the general characteristics of the different environments
17. Explain the impacts of environmental factors on microbial activities.
18. Explain how microorganisms can survive, spread, adaptive, resistant and tolerant in the extreme environments.
19. Summarize the microbe-microbe interaction, microbe-plant interaction, microbe-animal interaction
20. Differentiate between biodegradation and biodeterioration
21. Compare between the following environmental phenomena : biomagnification, Eutrophication, Spring blooming, Self-purification.
22. Describe the biodegradation process.
23. List microorganisms in air, water, soil, extreme environment and man-made environment, its role and activities.
24. Differentiate between the Ecosystems and Environments

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams

Discussions after the lecture

### c. Interpersonal Skills and Responsibility

At the end of the course, the student will be able to:

12. Use of needed precautions when dealing with microbes in the environment
  13. Evaluate effects of different actions of individuals and community on microbial activities in the environment
  14. Choose the suitable media and method for isolation different microbes from different habitats.
  15. Demonstrate professional attitudes and behaviors towards others.
- (xviii) Teaching strategies to be used to develop these skills and abilities
- Lab work
  - Case Study
  - Active learning
  - Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

### d. Communication, Information Technology and Numerical Skills

(xxxiv) Description of the skills to be developed in this domain.

At the end of the course, the student will be able to:

- Enhancing the ability of students to use computers and internet.
- Interpret the laboratory data
- Know how to write a report.

(xxxv) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.

(iii) Methods of assessment of students numerical and communication skills

- 1- Evaluation of presentations
- 2- Evaluation of reports
- 3- Practical exam

### e. Psychomotor Skills (if applicable)

At the end of the course, the student will be able to:

- 1-perform the laboratory experiments precisely
- 2-operate all devices in lab
- 3- Diagram solid wastes recycle.
4. Illustrate factors affecting the microbial flora in different environments.

(ii) Teaching strategies to be used to develop these skills

- Follow up students the students in lab and during carryout all the laboratory experiments

(xxxvi) Methods of assessment of students psychomotor skills

- Giving additional marks for the students they have accurate laboratory results and good seminar presentation
- Practical exam.

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

D. Student Support

15. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

E. Learning Resources

Required Text(s):

- (1)- Maier, R. M., Pepper, I. L. and Gerba, C. P. (2008) *Environmental Microbiology 2nd edition*. Academic Press, San Diego, CA, USA
- (2)- Madsen, E. L. (2008) *Environmental Microbiology: from Genomes to Biogeochemistry*. Blackwell Publishing, Malden, MA, USA
- (3)- McArthur, J. V. (2006) *Microbial Ecology: an Evolutionary Approach*. Academic Press, San Diego, CA, USA
- (4)- Hurst, C. J., Crawford, R. L., Garland, J. L., Lipson, D. A. and Mills, A. L. (2007) *Manual of Environmental Microbiology 3rd edition*. ASM Press, Washington DC, USA

Recommended Reading List

Kirchman, D. L. 2012. *Processes in Microbial Ecology*. Oxford University Press, Inc., New York, NY.

Madigan, M. T., and J. M. Martinko. 2010. *Brock Biology of Microorganisms*, 13th Ed., Pearson Benjamin Cummings, San Francisco, CA. [Study Aid; 14th Edition that came out in Jan. 2104 is OK too].

Atlas, R. M., and R. Bartha. 1998. *Microbial Ecology*, 4th Ed. Benjamin/Cummings Publishing Co., Inc. Menlo Park, CA. 694 p.

Burdlege, R. S., R. Atlas, D. Stahl, G. Geesey, and G. Saylor (eds.). 1998. *Techniques in Microbial Ecology*. Oxford University Press, New York.

Gerhardt, P., R. G. E. Murray, W. A. Wood, and N. R. Krieg (eds.). 1994. *Methods for General and Molecular Bacteriology*. American Society for Microbiology. Washington, DC.

Guerrero, R., and C. Pedrós-Alió (eds). 1993. *Trends in Microbial Ecology. Proceedings of the Sixth International Symposium on Microbial Ecology*. Spanish Society for Microbiology. Barcelona, Spain.

Hurst, C. J., G. R. Knudsen, M. J. McInernney, L. D. Stetzenback, and M. V. Walter (eds.). 1997. *Manual of Environmental Microbiology*. American Society for Microbiology. Washington, DC.

Kemp, P. F., B. F. Sherr, B. Sherr, and J. J. Cole (eds.). 1993. *Handbook of Methods in Aquatic Microbial Ecology*. Lewis Publishers. Ann Arbor, MI.

Kirchman, D. L. (ed.). 2000. *Microbial Ecology of the Oceans*. John Wiley & Sons, Inc. New York, NY.

Levin, M. A., R. J. Siedler, M. Rogul (eds.). 1992. *Microbial Ecology: Principles, Methods, and Applications*. McGraw-Hill, Inc. New York, NY. 945 p.

Lynch, J. M., and N. J. Poole (eds.). 1979. *Microbial Ecology - A Conceptual Approach*. Blackwell Scientific Publications. Oxford, England.

Martins, M. T., et al. 1997. *Progress in Microbial Ecology. Proceedings of the Seventh International Symposium on Microbial Ecology*. Brazilian Society for Microbiology. Sao Paulo, Brazil.

McAuthur, J. V. 2006. *Microbial Ecology, An Evolutionary Approach*. Elsevier, Burlington, MA. 416 p.

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Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)  
-<http://www.cdc.gov/mmwr/>  
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Other learning material such as computer-based programs/CD, professional standards/regulations

- Book note prepared by Associate professor Dr. Hussien Hassan Abulreesh

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

### 2. Computing resources

- Providing class rooms with computers and labs with data show.

### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability all kits for identification of the microorganisms isolated from different habitats

- Availability of VITEK device for rapid identification of microorganisms

#### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
<ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
3. Processes for Improvement of Teaching
<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
<ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations.</li> </ul>
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
<ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr. Hussein Hassan Abulreesh.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Dr. Khaled Elbanna. 2. Dr. Hussein Abulreesh. 3. Dr. Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein Abulreesh.	Signature:
Dean	Signature:
Date:	

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(13)- Microbial Toxicology 4014462-2

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology.
<b>A Course Identification and General Information</b>
36. Course title <b>Microbial Toxicology</b>
37. Course code: <b>4014462-2</b>
2. Credit hours: <b>2hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology</b>
38. Name of faculty member responsible for the course: <b>Prof. Khaled Jamel Allayl</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 8</b>
6. Pre-requisites for this course (if any): <b>Medical Microbiology (4013472-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

After completing this course the student should be able to:

- defined the microbial toxicology
- familiar with microorganisms produced toxins
- Differentiate between chemical toxins and biological toxins
- compare between Endotoxins and Exotoxins
- Diagnose the symptoms of bacterial toxins and mycotoxins
- list the types of bacterial and mycotoxins
- write briefly the structure of any microbial toxin
- Discuss the mechanism action of any toxin
- Describe the detoxification methods of the microbial toxins
- List the method used for assaying the bacterial and myco-toxins
- diagram the chemical structure of microbial toxins
- calculate the lethal dose of any toxin
- predict with the type of toxin through the symptoms
- summarize the conditions influencing the production of microbial toxins

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course is designed for students of applied microbiology to cover the basic aspects of microbial toxicology. The students will be familiar with the type toxins, specially microbial toxins. Also, the students will be study the structure and properties of microbial toxins. Also, mode of action of microbial toxins, antitoxins against Diphtheria, Cholera, and Tetanus will be covered. Fungal toxins (Aflatoxins), its production condition, Methods of detoxification, or removing the microbial toxins and the methods for assaying the microbial toxins will be studied.

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Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ Introduction: to microbial toxicology</b> -Definition of microbial toxins - Historical background about the microbial toxins - Types of toxins (chemical or biological toxins) - An overview about Microorganisms produced Toxins	1	2
<b>❖ General properties of microbial toxins</b> - Properties and Structures of microbial toxins -Mode of action of microbial toxins	1	2
<b>❖ Bacterial toxins</b> -General properties of bacterial toxins - Microorganisms produced toxins -Type of bacterial toxins (Endotoxins, Exotoxins): Botulinum, Tetanus toxin, Staphylococcal toxins, <u>Anthrax toxin</u> , <u>Diphtheria toxins</u> , <u>Shiga toxin</u> , Salmonella toxins, Erythrogenic Toxins, .....etc. -Structure of bacterial toxins -Level of toxicity -Symptom of each bacteria toxins - Mechanism of action of bacterial toxins - Diseases caused by or associated with bacterial toxins: - Methods for detoxification of bacterial toxins	3	6
<b>❖ Mycotoxins:</b> -General properties of fungal toxins - Microorganisms produced toxins -Type of fungal toxins: ( <u>Aflatoxins</u> , <u>Ochratoxin</u> , <u>Citrinin</u> , <u>Ergot Alkaloids</u> , <u>Patulin</u> , <u>Fusarium</u> toxins) -Structure of bacterial toxins -level of toxicity -Symptom of each bacteria toxins - Mechanism of action of bacterial toxins -Diseases associated with fungal toxins - Methods for detoxification of fungal toxins	3	6
<b>❖ Production of microbial toxins</b> Factors influence production of bacteria and fungal toxins	1	2
<b>❖ Methods for assaying the microbial toxins:</b> - Biological assays - Immunological assays - Gel diffusion assays - Haemagglutination - Coagglutination - Enzyme-linked immunosorbent assay - Enzyme-linked immunofiltration assay. - Radioimmunoassay. - Nucleic acid probes and polymerase chain Reaction (PCR technique)	2	4

❖ <b>Methods for determination of mycotoxins:</b> - <i>sample pretreatment methods</i> such as liquid–liquid extraction (LLE), supercritical fluid extraction (SFE), solid phase extraction (SPE), (b) <i>separation methods</i> such as (TLC), high performance liquid chromatography (HPLC), gas chromatography (GC), and capillary electrophoresis (CE) and (c) <i>others</i> such as ELISA.	1	2
❖ <b>Relationship between microbial toxins and cancer</b>	1	2
❖ <b>Methods for detoxification and removing the microbial toxins</b>	1	2
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical:	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
12h (reports & essay).

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**1. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course The student will be able to:

- define the microbial toxicology
- familiar with microorganisms produced toxins
- Differentiate between chemical toxins and biological toxins
- compare between Endotoxins and Exotoxins
- Diagnose the symptoms of bacterial toxins and mycotoxins
- list the types of bacterial and mycotoxins
- write briefly the structure of any microbial toxin
- Describe the detoxification methods of the microbial toxins
- List the method used for assaying the bacterial and myco-toxins

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- At the end of the programme, students will be divided into groups for

seminar presentation on important areas of the course to assess their understanding and comprehension of the course.

- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about microbial toxicology and the new microbial toxins.
- Availability of the reference books and scientific sites concerning the microbial toxicology in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam (1) (10%)
- Periodical exam (2) (10%)
- Report and activity (10%)
- Mid- term theoretical exam (20%)
- Final exam (50%)

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

- defined the microbial toxicology
- Differentiate between chemical toxins and biological toxins
- compare between Endotoxins and Exotoxins
- Diagnose the symptoms of bacterial toxins and mycotoxins
- write briefly the structure of any microbial toxin
- Discuss the mechanism action of any toxin
- Describe the detoxification methods of the microbial toxins
- diagram the chemical structure of microbial toxins
- calculate the lethal dose of any toxin
- predict with the type of toxin through the symptoms
- summarize the conditions influencing the production of microbial toxins

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams

Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

- At the end of the course, the student will be able to:
  16. Use of needed precautions when dealing with pathogen microbes
  17. demonstrates professional attitudes and behaviors towards others.
  18. Demonstrate his capability for the responsibility and Accountability
  19. show effective verbal communication with clarity.
  20. propose the smart questions
  21. understand and dissecting the problem so that it is fully solved and

understood.

22. demonstrate the assertiveness for his decision
23. illustrate the chemical structure of aflatoxin, Staphylotoxin, diphtheria toxin, ...etc
24. analyse and assaying any microbial toxins.
25. evaluate the methods for detoxification
26. write briefly report about microbial toxin

(xix) Teaching strategies to be used to develop these skills and abilities

- Case Study
- Active learning
- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of students presentations

d. Communication, Information Technology and Numerical Skills

(xxxvii) Description of the skills to be developed in this domain.

At the end of the course, the students

- will gain experience in effective communication skills by practicing, listening, reading, writing and speaking clearly.
- short oral presentations of 5-8 minutes will be required of all students and will be given during a class period.
- Students will pick a microbial toxicology topic and discuss specific issues related to the topic.

(xxxviii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.

(iii) Methods of assessment of students numerical and communication skills

- Evaluation of presentations
- Evaluation of reports
- Practical exam

e. Psychomotor Skills (if applicable)

1. demonstrate professional attitudes and behaviors towards others.
2. Demonstrate his capability for the responsibility and Accountability
3. show Effective verbal communication with clarity.
4. propose the smart questions
5. understand and dissecting the problem so that it is fully solved understood.
6. demonstrate the assertiveness for his decision

(xxxix) Teaching strategies to be used to develop these skills

- Case Study
- Active learning
- Small group discussion

(xl) Methods of assessment of students psychomotor skills

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of students presentations

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20 %
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

16. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

1- Microbial Toxins: Structure and Their Type Paperback – April 17, 2011

by [Rajeeva Gaur](#) (Author), [Soni Tiwari](#) (Author), [Ranjan Singh](#) (Author)

##### Recommended Reading List

1- Microbial Toxins: Current Research and Future Trends by [Thomas Proft](#) (Editor),

Publisher: Caister Academic Press (April 14, 2009)

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

[https://en.wikipedia.org/wiki/Microbial\\_toxins](https://en.wikipedia.org/wiki/Microbial_toxins)

Other learning material such as computer-based programs/CD, professional standards/regulations

PPT prepared by Prof. Dr. Khaled Jamal Allayl.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

2. Computing resources

- Providing class rooms with computers and labs with data show.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

**G Course Evaluation and Improvement Processes**

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Periodical revision of course content.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

Faculty member responsible for the course:

Prepared by faculty staff: <b>Prof. Khaled Jamal Allayl.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Head of Program <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

## (14)- Food Quality Control 4014482-2

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY.</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology.</b>
<b>A Course Identification and General Information</b>
1. Course title <b>Food quality control</b>
2. Course code: <b>4014482-2</b>
2. Credit hours: <b>2hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
4. Name of faculty member responsible for the course: Associate <b>Prof. Dr. Khaled Elbanna (kabana@uqu.edu.sa)</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 8</b>
6. Pre-requisites for this course (if any): <b>Food Microbiology (4014421-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

### B Objectives

The general objective of the course is to acquaint the student with the basic roles of food quality control in providing quality and safe foods.

At the end of the course, the student will be able to:

- (1) define and differentiate between quality assurance and quality control.
- (2) explain the importance of food quality control systems in satisfying the requirements of both the consumer and legislation.
- (3) determine food quality using methods such as instrumentation, microbiological, chemical and sensory evaluation.
- (4) describe food adulteration, detection and prevention.
- (5) develop an effective HACCP plan for a given food production system
- (6) List the prerequisite programs need for HACCP
- (7) mention the food safety who's role
- (8) discuss the food borne diseases
- (9) List the organizations and agencies responsible for international food standard and the international food legislations

### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This is a compulsory course for students studying Food Science. The course provides comprehensive definitions of food quality control and quality assurance. It also describes the quality control procedures and objectives in the production of food to satisfy the customers' desire for quality and safe foods and legal requirements. Also, the students should be aware with the international food legislations. The quality factors in food such as appearance (size and shape), colour, consistency, textural, flavor and additional factors are covered. Chemical and Microbiological determination of food quality are also considered. The course explains the conditions that prove a food to be regarded as adulterated or misbranded. Methods of prevention of food adulteration are described. The involvements of governments in regulating foods to ensure safety to prevent economic fraud or deception. The recent third objective of informing consumers about the nutritional content of foods is described. The course considers definition



of specification, raw material and finished product specifications, with roles of Food Standards, International Standards for foods, Codex, as well as kingdom Saudi Arabia food standards. The concept of Hazard Analysis, Critical Control Points (HACCP) as a systematic approach in safety issues is considered. The course is designed to introduce students to the requirement in the food industry of maintaining high quality, particularly with the requirement for companies selling food in Kingdom Saudi Arabia.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
<b>❖ Introduction to Food Quality Evaluation and Control</b> -Some important expressions: Food Quality Food Quality control Food Quality Assurance Food Safety-: Food Inspection International Standard Organization HACCP Barcode	1	2
<b>❖ Legislation and Food Laws</b> The Food Regulatory Process -Food Laws (a) -International Standards Organisation (ISO) (b) Codex Alimentarius Commission (c) National Standards -The Food and Drug Administration -The Standards Organization of Saudi Arabia (SOS) -Other organizations interested with foods such: FDA: Food and Drug Administration . WHO: World Health Organization FAO : Food Agriculture Organization	1	2
<b>Food Lot, Principles and methods of food quality control</b> -the methods used for evaluation of the food lots - Tests used for evaluation of the food lot: - Microbiological, chemical and physical testes -Sensory evaluation, Principles of sensory evaluation and taste Theories, -Design and analysis of Questionnaire for taste panel.	1	2



❖ <b>Food standard:</b> -Organization that corresponding for food Standard :FAD, WHO, Codex, ESO, SASO , FAO -Food standard contents -The objectives of Food Standard -ISO 9000 -ISO 22000	3	6
❖ <b>HACCP: HAZARD ANALYSIS AND CRITICAL CONTROL POINTS</b> -What is the meaning of HACCP - Aims and Benefits of HACCP -Principles of HACCP -Advantages of HACCP	4	8
❖ <b>PREREQUISITE PROGRAMS for HACCP:</b> -Good Manufacturing practice (GMP) - Good Hygienic Practice (GHP) - Total Quality Management -Sanitation for Buildings, Instruments - Pest Control - Personal hygiene - Training for workers - Product Recall -Consumers complaints -Codex instructions		
<b>Food Hazards:</b> Types of food hazards : 1-Biological hazards 2- Chemical Hazards 3-Physical Hazards	2	4
<b>FOOD BORNE DISEASES:</b> <b>Food Infection:</b> Salmonellosis, Shigellosis, Campylobacteriosis, Listerosis, Yersinosis, Vibrosis, Brusilosis, Amebic dysentery, Human Virus diseases <b>Food Intoxication:</b> STAPHYLOCOCAL FOOD POISONING, food botulism, <i>Bacillus cereus</i> food poisoning., <b>FOOD MICOTOXICOSIS</b>		
<b>FOOD SAFETY WHO'S ROLE:</b> - Governments Role in Food Safety - Role of Industry in Food safety - Role of distributors and retailers in food safety -Role of international Agencies in food safety - Consumers Role in Food Safety	2	4
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

**4. Development of Learning Outcomes in Domains of Learning**

**For each of the domains of learning shown below indicate:**

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

**m. Knowledge : Description of the knowledge to be acquired**

**Upon successful completion of this course The student will be able to:**

- (1) define and differentiate between quality assurance and quality control.**
- (3) determine food quality using methods such as instrumentation, microbiological, chemical and sensory evaluation.**
- (4) describe food adulteration, detection and prevention.**
- (5) develop an effective HACCP plan for a given food production system**
- (6)list the prerequisite programs need for HACCP**
- (7) mention the food safety who's role**
- (8) discuss the food borne diseases**
- (9) list the organizations and agencies responsible for international food standard and the international food legislations**
- (10) Identify hazards and critical control points of different existing production processes.**

**(ii) Teaching strategies to be used to develop that knowledge**

- **The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to investigate different food products in the laboratory.**
- **At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.**
- **All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.**
- **Using images and movies**
- **Identify hazards and critical control points of different existing production**

<p>processes</p> <ul style="list-style-type: none"> <li>Encouraging students to collect the new information about new methods used for assessment of the food products in the labs</li> <li>Enable the reference books and scientific sites concerning food quality control in internet.</li> </ul>
<p>(iii) Methods of assessment of knowledge acquired:</p> <ul style="list-style-type: none"> <li>Periodical exam and reports 10%</li> <li>Mid- term theoretical exam 20%</li> <li>Mid-term practical exam 5%</li> <li>Final practical exam 15%</li> <li>Final exam 50%</li> </ul>
<p><b>b. Cognitive Skills</b></p> <p>(i) Cognitive skills to be developed</p> <p>Having successfully completed the course students should be able to:</p> <ol style="list-style-type: none"> <li>explain the importance of food quality control systems in satisfying the requirements of both the consumer and legislation.</li> <li>Describe the importance of food quality control.</li> <li>develop an effective HACCP plan for a given food production system</li> <li>describe food adulteration, detection and prevention.</li> <li>discuss the food borne diseases</li> <li>Explain the importance of a quality control programmes.</li> <li>Discuss the necessity of HACCP in the food Industry.</li> <li>Identify the various stages in developing HACCP in food industry.</li> <li>Describe the application of HACCP concept for the production of any named food.</li> </ol> <p>(ii) Teaching strategies to be used to develop these cognitive skills:</p> <p>Through lectures and Field visits to factories and food companies.</p> <p>which introduced to the students to enable them to :</p> <ol style="list-style-type: none"> <li>explain the concept of HACCP and be able to create an effective HACCP plan for a given situation.</li> <li>Application of HACCP to food processing.</li> <li>assessment the quality of the food products</li> </ol> <p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> <li>Exam must contain questions that can measure these skills.</li> </ul>
<p><b>c. Interpersonal Skills and Responsibility</b></p> <p>(xx) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> <li>student should be able to obtain knowledge by himself from different sources</li> <li>the student is encouraged to work in a team.</li> </ul> <p>(xxi) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> <li>Open class discussions with students for minutes during lectures and labs.</li> </ul>

<ul style="list-style-type: none"> <li>Students (as groups and individuals) should give reports concerning certain topics of the course.</li> </ul>
<p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>Evaluate the efforts of each student in preparing the report.</li> <li>Evaluate the scientific values of reports.</li> <li>Evaluate the work in team</li> </ul>
<p>d. Communication, Information Technology and Numerical Skills</p> <p>(xli) Description of the skills to be developed in this domain.</p> <ul style="list-style-type: none"> <li>Enhancing the ability of students to use computers and internet.</li> </ul> <p>(xlii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>Seminars presentation</li> <li>Field visits to food factories</li> </ul> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> <li>Evaluation the efforts of students in preparing the reports and referring the references.</li> </ul>
<p>e. Psychomotor Skills (if applicable)</p> <p>Description of the psychomotor skills to be developed and the level of performance required</p> <p>Upon successful completion of this course, the student is expected to be able to:</p> <ul style="list-style-type: none"> <li>(3) carry out sensory evaluation of a newly developed product;</li> <li>(4) carry out all tests used for microbiological and chemical evaluations.</li> </ul>
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>Follow up students during preparing slides, examination and isolation. Food sample preparation</li> </ul>
<p>(xliii) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>Giving additional marks for preparing the best slide and correct prepared culture media, isolate and identify the important microorganisms that playing an important role in food and dairy products</li> </ul>

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20 %
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

17. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

- Course note and PPT prepared by faculty member responsible for the course: Associate Prof. Dr. Khaled Elbanna
- Lutfy Hamzawy (2002). Food safety and HACCP. Scientific home books for publishing and distribution, Cairo, Egypt.

#### Recommended Reading List

- Kramer, A. and Twigg, B.A. (1973) Quality control for food industry ,Vol. I, II.Avi.
- Person, M.D. and Corlett, Jr. D.A. (Editors), 1992. HACCP: Principles and Applications. Chapman and Hall, London, New York.
- Lyon, D.H., Francombe, M.A., Hasdell, T.A., Lawson, K. (Editors). 1992. Guidelines for Sensory Analysis in Food Product Development and Quality Control. Chapman and Hall, New York.
- Harrigan, W.F. and Park, R.W.A. 1991. Making Safe Food: A Management Guide for Microbiological Quality, Academic Press, London.
- Schewart, W.A. (1980) Economic Control of Quality Manufactured Products. Van Nostrand.
- Datta, A.K. (1991), Sensory Science: Principles and applications. In: Encyclopedia of Food Science and Technology Edited by Y.H.Hui, John Wiley and Sons, Inc; Vol. 4; 2333-2353
- ISO 4121 (1987) Sensory Analysis-Methodology Evaluation of Food Products by Methods of using Scales.
- ISO 8587 (1988) Sensory Analysis-Methodology- Ranking
- Tomlins, K. (1995). Manual for Sensory Evaluation of Non-grain Starch Staple Food Crops: Natural Resources Institute, Chatham Maritime, United Kingdom.

- Juran, J.M. 1988. Quality Control Handbook. McGraw Hill Inc. New York.
- ISO 9000- Quality Management and Quality Assurance Standards-guidelines for Selection and Use. First edition. 1987.
- Savage R.A. 1995. Hazard Analysis Critical Control Point: A review. Food Rev. Int., 11(4), 575- 595.
- Saudi Arabia food standards and quality control-----

Electronic Materials, Web Sites

- [https://en.wikipedia.org/wiki/Food\\_quality](https://en.wikipedia.org/wiki/Food_quality)
- <http://www.foodqualitynews.com/>
- [http://web.vscht.cz/~kocourev/en\\_GB/study.html](http://web.vscht.cz/~kocourev/en_GB/study.html)
- <http://www.Safeefood.net>
- <http://WWW.Meatami.org/HACCP-home.html>.

Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by Associate prof. Dr. Khaled Elbanna.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - Class room is already provided with data show
  - The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
2. Computing resources
  - Providing class rooms with computers and labs with data show.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - Availability of some reference bacterial and fungal slides
  - Availability of some reference bacterial strains
  - Availability new light microscopes
  - Availability different specific media and chemicals used for isolation.
  - Availability of some material and instruments used for preparation some foods

#### G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - Questionnaires
  - Open discussion in the class room at the end of the lectures
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - Revision of student answer paper by another staff member.
  - Analysis the grades of students.
3. Processes for Improvement of Teaching
  - Preparing the course as PPT.
  - Using scientific movies.



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<ul style="list-style-type: none"> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution.</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: <b>1. Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean	Signature:
Date:	



## (D)- Supporting courses

### (1)- Biochemistry 4012312-3

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY.</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology.</b>
<b>A Course Identification and General Information</b>
39. Course title <b>Biochemistry.</b>
40. Course code: <b>4012312-3</b>
2. Credit hours: <b>3hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
41. Name of faculty member responsible for the course: <b>Professor Shady M. ElShehawy.</b>
5. Level/year at which this course is offered: <b>2<sup>nd</sup> Year / Level 4.</b>
6. Pre-requisites for this course (if any): <b>Organic Chemistry (4022301-4).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

## B Objectives

After completing this course student should be able to:

1. Understand the molecular and cellular biochemistry.
2. Develop understanding of the biosynthesis and biochemical role of the specialized tissues of the body.
3. Develop the student's awareness of the biochemical bases of tissue associated diseases.

## C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of Biochemistry, particularly on the structure and metabolism of biomolecules, such as water, carbohydrates, proteins, lipids and vitamins. This course will provide a conceptual and experimental background in biochemistry sufficient to enable students to take courses that are more advanced in related fields.



<b>1 Topics to be Covered</b>		
<b>Topic</b>	<b>No of Weeks</b>	<b>Contact hours</b>
❖ <b>Introduction:</b> Introduction to Biochemistry (Importance and targets).	1	5
❖ <b>Water</b> -composition. -importance. -properties.	1	5
❖ <b>Carbohydrates I</b> Structure of monosaccharide – formation of polysaccharides – structure of polysaccharides.	1	5
❖ <b>Carbohydrates II</b> Glycoproteins – Ionic polysaccharides.	1	5
❖ <b>Carbohydrate Metabolism</b> Glycolysis – Glycogen – Citric Acid Cycle – Electron Transport Chain – Energy and ATP.	2	10
❖ <b>Proteins I</b> Amino acids – proteins primary structure – protein secondary structure.	1	5
❖ <b>Mid-term Exam</b>	1	5
❖ <b>Proteins II</b> Proteins tertiary structure – proteins quaternary structure – protein dynamics – what do proteins do?	1	5
❖ <b>Proteins Metabolism and Urea formation</b> Deamination of amino acids – Urea cycle – delaminated amino acids as metabolic fuels – Amino acids as biosynthetic precursors -	1	5
❖ <b>Lipids I</b> Classification and structure of lipids – micelles – bilayers and liposomes.	1	5
❖ <b>Lipids II</b> Biological membrane – lipoproteins – transport through membranes.	1	5
❖ <b>Lipids Metabolism</b> Production of Acetyl-coA from lipids – Ketone bodies – fatty acids biosynthesis – glycerol	1	5
❖ <b>Vitamins and cofactors</b> Definition and function of vitamins and cofactors.	1	5
❖ <b>Revision</b>	1	5
❖ <b>Final exam</b>	1	5
<b>Total</b>	<b>16 weeks</b>	<b>80 hrs</b>

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture</b> : 32 hrs	<b>Tutorial:</b>	<b>Practical: 48 hrs</b>	<b>Other: 32 hrs</b>

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**2 hrs /week as office hours to help some students.**

**4. Development of Learning Outcomes in Domains of Learning**

**For each of the domains of learning shown below indicate:**

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**n. Knowledge : Description of the knowledge to be acquired**

**(i) Upon successful completion of this course the student will be able to:**

1. Enumerate the different reaction of carbohydrates, fats and protein metabolism.
2. Remember the different types of amino acids.
3. Distinguish the difference between aerobic and anaerobic oxidation.
4. Recognize the anabolism and catabolism and nitrogen balance.
5. Know the reactions, importance and regulation of carbohydrate, proteins and lipid metabolism.

**(ii) Teaching strategies to be used to develop that knowledge**

1. Lectures and student research papers.
2. The using of visual display such as PowerPoint.
3. Homework assignments.
4. Discussions (connecting what they learn in the class and applying this information in laboratory).
5. Handout of lecture notes for each topic.

**(iii) Methods of assessment of knowledge acquired:**

1. Homework and Quizzes.
2. Midterm and final written exams.
3. Evaluation of reports.
4. Group discussions and participation in the lecture.
5. Course work reports.

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

1. Understand the importance of carbohydrates, proteins and lipid function and its role in metabolism.
2. Draw the metabolic pathways of carbohydrates, proteins and lipid.
3. To recognize the difference between energy production from lipid and carbohydrates.

**(ii) Teaching strategies to be used to develop these cognitive skills:**

1. Interactive lectures.
2. Seminars.
3. Participation of students in discussions during the lecture.

<p>4. Trying to explain the issues in regular and motivated manner.</p> <p>(iii) Methods of assessment of students cognitive skills</p> <ol style="list-style-type: none"> <li>1. Exam must contain questions that can measure these skills.</li> <li>2. Quiz and exams.</li> <li>3. Discussions after the lecture.</li> </ol>
<p>c. Interpersonal Skills and Responsibility</p> <p>(i) At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. The ability to form groups and the distribution of tasks. Ability to work independently to complete the assignment given.</li> <li>2. Perform self-directed learning.</li> <li>3. The ability to exchange ideas and accept the opinions of others and perform group discussions.</li> <li>4. Skill presentation in front of others.</li> <li>5. Ability to clearly express an opinion and accept the opinions of others.</li> </ol> <p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ol style="list-style-type: none"> <li>1. Hold brain-storming during lectures.</li> <li>2. Deep discussion with the students by asking some diverse and exciting oral questions during the lecture.</li> <li>3. Using PowerPoint presentation and gland illustration. Writing group reports</li> <li>4. Solving problems in groups during tutorial</li> <li>5. Checking the homework assignments in groups during discussion</li> <li>6. Give students the opportunity to discuss any items with the faculty member.</li> <li>7. To raise the spirit of cooperation among students.</li> <li>8. Sharing duties (interactive workshop / joint presentation / report / prepare working papers / bring duties ... etc).</li> <li>9. Dividing students into groups to cooperate with each other during the experiments.</li> </ol> <p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ol style="list-style-type: none"> <li>1. Oral exams.</li> <li>2. Evaluation of student essays assignments and search work.</li> <li>3. Request a share presentation in front of the students through discussions.</li> <li>4. Students' attendance is recorded during lectures.</li> <li>5. Assessment of the student reports.</li> <li>6. Grading homework assignments.</li> </ol>
<p>d. Communication, Information Technology and Numerical Skills</p> <p>(xlv) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Use information and communication technology.</li> <li>2. Use IT and communication technology in gathering and interpreting information and ideas.</li> <li>3. Use e-mail to communicate with the instructor and other students.</li> <li>4. Encourage students to use internet for searching certain electronic journals regarding topics of the course.</li> </ol>

5. Try to write scientific writing.
6. Use his/her observations to solve problems.
7. Access useful sites on the Internet, in order to search for specific data and information.
8. Calculate and discuss the facts and logical propose methods to solve the difficulties.

(xlv) Teaching strategies to be used to develop these skills

1. Oral presentations.
2. Internet search assignments and essays.
3. Incorporating the use and utilization of computer in the course requirements.
4. Request the students to send their home works and research via e-mail.
5. Asking the students to exploit some useful sites in the internet associated with the topics of decision for further learning.

(iii) Methods of assessment of students numerical and communication skills

1. Evaluation of student essays and assignments.
2. Marks given to for good reports and presentations
3. Evaluating during the discussion in lecture and reports. Part of the grad is put for student's written participation.

e. Psychomotor Skills (if applicable)

(i) At the end of the course, the student will be able to:

1. Perform all techniques for preparation of chemical solutions.
2. Perform all biochemical test for the identification of biomolecules, carbohydrate; proteins; lipids.
3. Operate selected instruments used in biochemistry laboratory.

(ii) Teaching strategies to be used to develop these skills

1. Follow up students the students in lab and during carryout all analytical techniques.

(iii) Methods of assessment of students psychomotor skills

1. Giving additional marks for preparing correct Lab results and good seminar presentation.
2. Practical exam.

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Exam duration	Proportion of Total Assessment
1 Periodical Exam(s)	4	15 min	10 %
2 Mid Term Exam (Theoretic)	8	60 min	20 %
3 Mid Term Exam (practical)	9	30 min	10 %
4 Reports and essay	11	--	5 %
5 Final Practical Exam	15	60 min	15 %
6 Final Exam	16	120 min	40 %
Total			100%



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#### D. Student Support

18. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

3 hours per week as office hours and can be arranged according to the student needs.

#### E. Learning Resources

##### Required Text(s):

Principles of Biochemistry (Second Edition) A. L. Lehninger; D. L. Nelson and M. M. Cox (1993).

##### Recommended Reading List

1. Charlotte W. Pratt and Kathleen Cornely (2010). Biochemistry 2<sup>nd</sup>. Published by John Wiley & Sons.
2. Robert, H. Horton, Laurence A. Moran, K. Gray Scrimgeour, Marc D. Perry, and J. David Rawn (2006). Principles of Biochemistry fourth edition by Pearson Education, Inc. Pearson Prentice Hall Pearson Education, Inc.

##### Electronic Materials, Web Sites

(eg. Web Sites, Social Media, Blackboard, etc.)

Other learning material such as computer-based programs/CD, professional standards/regulations

PPT prepared by Professor Shady M. ElShehawy.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - Class room is already provided with data show.
  - The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
2. Computing resources
  - Providing class rooms with computers and labs with data show.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionaries.
- Open discussion in the class room at the end of the lectures.

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

##### 3. Processes for Improvement of Teaching



<ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part.</li> <li>• Periodical revision of course content.</li> </ul>
<p>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations.</li> </ul>
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution.</li> </ul>

Faculty member responsible for the course:

Prepared by faculty staff: 1. Professor Shady M. ElShehawy.	Signature:
Date Report Completed: 1.04.2018	
Revised by: 1. Professor Khaled A. Elbanna. 2. Dr. Hussein H. Abulreesh. 3. Professor Shady M. ElShehawy.	Signature:
Date: 1.04.2018	
Program Chair Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

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## (2)- Biostatistics 4012161-3

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY.</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology.</b>

### A Course Identification and General Information

42. Course title <b>Biostatistics.</b>
43. Course code: <b>4012161-3.</b>
2. Credit hours: <b>3hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
44. Name of faculty member responsible for the course: <b>Professor Shady M. ElShehawy.</b>
5. Level/year at which this course is offered: <b>2<sup>nd</sup> Year / Level 3.</b>
6. Pre-requisites for this course (if any): <b>--</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

### B Objectives

<p><b>After completing this course student should be able to:</b></p> <ol style="list-style-type: none"> <li>1. <b>Know and remember the basic concepts of statistics and probability such as displaying the data, central tendency, dispersion, coefficient of correlation, probability and types of random variables. Some probability distributions.</b></li> <li>2. <b>learn classification and description of the data.</b></li> <li>3. <b>Understand the meaning of correlation coefficient between two variables.</b></li> <li>4. <b>Carryout some simple statistical examinations manually and using SPSS program.</b></li> </ol>
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### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of Biostatistics, Specific topics include tools for describing central tendency and variability in data; methods for performing inference on population means and proportions via sample data; statistical hypothesis testing and its application to group comparisons; issues of power and sample size in study designs; and random sample and other study types. While there are some formulae and computational elements to the course, the emphasis is on interpretation and concepts.

Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ <b>Introduction:</b> Introduction to Biostatistics (Importance and targets).	1	3
❖ <b>Descriptive Statistics</b> Data as a simple/grouped frequency tables. Data presentation (frequency distribution) and box-plot.	2	6
❖ <b>Data Presentation</b> Different types bars and histograms. Data presentation by pie and graphs.	1	3
❖ <b>Measures of central tendency</b> Mean, medium and mode.	1	3
❖ <b>Measures of dispersion.</b> Range, variance, standard deviation and mean deviation.	2	6
❖ <b>Mid-term exam &amp; correcting homework</b>	1	3
❖ <b>Parametric tests</b> ❖ F test ❖ ANOVA - One way analysis of variance, two way analysis of variance.	2	6
❖ <b>T test</b> T-test for single sample, two independent samples and t-test for paired samples.	1	3
❖ <b>Non-parametric tests</b> Chi Square test.	1	3
❖ <b>Examples of Biological indices</b>	1	3
❖ <b>Use of MS Excel to present data</b>	1	3
❖ <b>Use of SPSS to perform and analyze data</b>	1	3
❖ <b>Final exam</b>	1	3
<b>Total</b>	<b>16 weeks</b>	<b>48hrs</b>

2 Course components (total contact hours per semester):

Lecture : 48 hrs	Tutorial:	Practical:	Other: 64 home work
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3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
2 hrs /week as office hours to help some students.



### Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

1. A brief summary of the knowledge or skill the course is intended to develop.
2. A description of the teaching strategies to be used in the course to develop that knowledge or skill.
3. The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
4. The methods of student assessment to be used in the course include:
  - a. Open discussion,
  - b. Activities,
  - c. Periodical quiz test,
  - d. Mid-term and final exams.

#### **o. Knowledge :**

##### **(i) Knowledge skills to be developed**

Upon successful completion of this course The student will be able to:

1. Organize and display the data as a simple/grouped frequency table according to its type Qualitative data.
2. Be aware by the measures of central tendency and dispersion. Quantative data.
3. Understand the basic concepts of Descriptive statistics and Some biological indices.
4. Remember the equations used in both parametric and non-parametric tests such as F teat, T test and Chi square test.
5. Understand the statistical analysis of variables.

##### **(ii) Teaching strategies to be used to develop that knowledge**

1. Lectures.
2. Home work.
3. Statistical exercises.

##### **(iii) Methods of assessment of knowledge acquired:**

1. Short discussions.
2. Short essay questions.
3. Term activities.
4. Home works.
5. Final and midterm exam.

#### **b. Cognitive Skills**

##### **(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

1. Display and organize different types of data . Represent the data.
2. Distinguish between the central tendency and dispersion Statistical measurements.

##### **(ii) Teaching strategies to be used to develop these cognitive skills:**

1. Lectures.
2. Brain storming.
3. Discussion.

##### **(iii) Methods of assessment of students cognitive skills**

1. Exam must contain questions that can measure these skills.
2. Quiz and exams.

3. <b>Discussions.</b>
<p><b>c. Interpersonal Skills and Responsibility</b></p> <p>(i) <b>Description of the skills to be developed in this domain</b>  <b>At the end of the course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Evaluate information.</li> <li>2. Calculate the measures of central tendency, dispersion and correlation.</li> <li>3. Solve some problems related to the distributions of discrete random variables.</li> <li>4. Perform statistical test and analyse statistical data.</li> <li>5. Judge the importance of biostatistics.</li> </ol> <p>(ii) <b>Teaching strategies to be used to develop these skills and abilities</b></p> <ul style="list-style-type: none"> <li>• Lab work.</li> <li>• Case Study.</li> <li>• Active learning.</li> <li>• Small group discussion.</li> </ul> <p>(iii) <b>Methods for assessment of the students interpersonal skills and capacity to carry responsibility</b></p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team.</li> <li>• Evaluation of the role of each student in lab group assignment.</li> <li>• Evaluation of students presentations.</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p> <p>(i) <b>Description of the skills to be developed in this domain.</b>  <b>At the end of the course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. use computers and internet.</li> <li>2. Interpret biostatistics data.</li> <li>3. Present biochemical data.</li> <li>4. Know how to write a report.</li> <li>5. Search on the internet.</li> <li>6. Design a professional presentation.</li> </ol> <p>(ii) <b>Teaching strategies to be used to develop these skills</b></p> <ol style="list-style-type: none"> <li>1. Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>2. Seminars presentation.</li> </ol> <p>(iii) <b>Methods of assessment of students numerical and communication skills</b></p> <ul style="list-style-type: none"> <li>• Evaluation of presentations.</li> <li>• Evaluation of reports.</li> </ul>
<p><b>e. Psychomotor Skills (if applicable)</b></p> <p>(i) <b>Description of the skills to be developed in this domain</b>  <b>At the end of the course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Perform all static test using test equations.</li> <li>2. Perform all statics test using appropriate computer software such as MS Excel and SPSS.</li> </ol>
<p>(ii) <b>Teaching strategies to be used to develop these skills</b></p> <ol style="list-style-type: none"> <li>1. Follow up students the students in lab and during carryout all computer</li> </ol>

<b>exercises.</b>
(iii) Methods of assessment of students psychomotor skills
1. Homework.
2. Practical exam.

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Exam duration	Proportion of Total Assessment
1 Periodical exam	6 <sup>th</sup> week	15 min	10%
2 Mid-term exam	8 <sup>th</sup> week	60 min	20 %
3 Term paper report	All weeks	15 min	10%
4 Discussion and interaction	All weeks	15 min	10%
5 Homework	All weeks	30 min	10%
6 Final exam	16 <sup>th</sup> week	120 min	40%
<b>Total</b>			<b>100%</b>

#### D. Student Support

19. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

3 hours per week as office hours and can be arranged according to the student needs.

#### E. Learning Resources

##### Required Text(s):

Chap T. LE. (2003). Introductory Biostatistics. John Wiley & Sons Publication.

##### Recommended Reading List:

Daniel, W.A. (1987). Biostatistics: A foundation for analysis in the health sciences. 4<sup>th</sup> Ed. New York: Wiley.

##### Electronic Materials, Web Sites

<http://jmasi.com/ehsa/index.htm>

Other learning material such as computer-based programs/CD, professional standards/regulations

1. Software program such as Excel and SPSS.
2. PPT prepared by Professor Shady M. ElShehawy.

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - Class room is already provided with data show.
  - The area of class room is suitable concerning the number of enrolled students and air conditioned.
2. Computing resources
  - Providing class rooms with computers and labs with data show.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

**G Course Evaluation and Improvement Processes**

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - Questionaries.
  - Open discussion in the class room at the end of the lectures.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - Revision of student answer paper by another staff member.
  - Analysis the grades of students.
3. Processes for Improvement of Teaching
  - Preparing the course as PPT.
  - Using scientific movies.
  - Coupling the theoretical part with laboratory part.
  - Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
  - After the agreement of Department and Faculty administrations.
- 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
  - Periodical revision by Quality Assurance Unit in the Department and Institution.

Faculty member responsible for the course:

Prepared by faculty staff: <b>1. Professor Shady M. ElShehawy.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Professor Khaled A. Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Professor Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh</b>	Signature:
Dean	Signature:
Date:	

### (3)- Antimicrobial Agents 4013421-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology</b>

#### A Course Identification and General Information

45. Course title <b>Antimicrobial Agents</b>
46. Course code: <b>4013421-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
47. Name of faculty member responsible for the course: <b>Dr. Hussein H. Abulreesh (hhabulreesh@uqu.edu.sa)</b>
5. Level/year at which this course is offered: <b>3rd Year / Level 5</b>
6. Pre-requisites for this course (if any): <b>Bacteriology (4012422-3) / Mycology (4012432-3).</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Main campus.</b>

#### B Objectives

After completing this course student should be able to:

**Describe the general characteristics of antimicrobial agents**

4. Understand the mode of action of antimicrobial agents

5. Understand the mechanisms of drug resistance

3. Describe the transmission of drug resistance genes and drug resistant pathogens in the environment and clinical settings.

4. understand how to overcome resistance and developing novel antimicrobial drugs.

#### C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course aims to give students through knowledge of the mode of action of clinically relevant antimicrobial agents, mechanisms of drug resistance, isolation and identification of novel antimicrobial resistant organisms. Topics covered: review of the main groups of antimicrobial agents; detailed examination of clinically useful antimicrobial agents; modes of action, spectrum of activity; major limitation to use; development of resistance; molecular basis of resistance; novel antibiotics isolation, characterization and development .

##### 1 Topics to be Covered

Topic	No of Weeks	Contact hours
❖ <b>Introduction:</b> -An overview of antimicrobial chemotherapy - Historical background - Main groups of antimicrobial agents	1	2
❖ <b>Antimicrobial agents</b> - Clinically relevant antimicrobial agents - Mode of action -Spectrum of activity -Major limitation to use	3	6

❖ <b>Antimicrobial drug resistance I</b> - development of resistance -biochemical basis of drug resistance - molecular basis of drug resistance	3	6
❖ <b>Antimicrobial drug resistance II</b> - resistance in clinical environments - transmission of resistance genes in the environment - measures to reduce the occurrence of resistance	2	4
❖ <b>Antifungal and antiseptic agents</b> - Clinical relevant antifungal agents - Mode of action -spectrum of activity	1	2
❖ <b>Antiviral agents</b> - clinically relevant antiviral agents - mode of action - spectrum of activity	1	2
❖ <b>Existing Antimicrobial agents</b> -improve existing antimicrobial agents - increase spectrum of activity - overcome resistance	2	4
❖ <b>Novel antimicrobial agents</b> -developing novel antimicrobial agents -role of industry - industrial process	1	2
	14 weeks	28hrs

2 Course components (total contact hours per semester):

Lecture : 28	Tutorial:	Practical: 42	Other:
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3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay)

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**p. Knowledge : Description of the knowledge to be acquired**

**Upon successful completion of this course The student will be able to:**

1. Describe the general characteristics of antimicrobial agents
2. Understand the mode of action of antimicrobial agents
3. Understand the mechanisms of drug resistance
3. Describe the transmission of drug resistance genes and drug resistant pathogens in the environment and clinical settings.
4. understand how to overcome resistance and developing novel antimicrobial drugs.

**(ii) Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new bacteriology
- Enable the reference books and scientific sites concerning bacteriology in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam (s) 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 10%
- Report and activity 5%
- Final practical exam 15%
- Final exam 40%

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

**Having successfully completed the course students should be able to:**

4. Describe the general characteristics of antimicrobial agents
5. Understand the mode of action of antimicrobial agents
6. Understand the mechanisms of drug resistance
3. Describe the transmission of drug resistance genes and drug resistant pathogens in the environment and clinical settings.
4. understand how to overcome resistance and developing novel antimicrobial drugs.

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures

-Brain storming

-Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

- Quiz and exams

- Discussions after the lecture

### Interpersonal Skills and Responsibility

List Of Interpersonal Skills: 10 Must-Have Attributes:

1. Verbal Communication

• Effective verbal communication begins with clarity

2. Non-verbal Communication:

Non-verbal communication is something that other people notice whether you are aware of your actions or not.

3. Listening, Questioning is a great way to initiate a conversation. It demonstrates interest and can instantaneously draw someone into your desire to listen.

4. Questioning: is a great way to initiate a conversation. It demonstrates interest and can instantaneously draw someone into your desire to listen. Smart questions show that you know how to approach problems and how to get the answers you need.

5. Good manners: tend to make many other interpersonal skills come naturally.

6. Problem solving :The key aspects of successful problem solving are being able to identify exactly what the problem is, dissecting the problem so that it is fully understood.

7. Social Awareness: Being in tune to others' emotions is an essential interpersonal skill. This dictates how many of your other interpersonal skills should function.

8. Self-management: allows us to control our emotions when they are not aligned with what would be considered appropriate behavior for a given situation.

9. Responsibility and Accountability:

Responsibility and accountability are two reliable indicators of maturity.

10. Assertiveness:

Being assertive is the only way to get your ideas onto a competitive table.

Description of the interpersonal skills and capacity to carry responsibility to be developed .

At the end of this course, the student will be able to:

- demonstrate professional attitudes and behaviors towards others.
- Demonstrate his capability for the responsibility and Accountability
- show Effective verbal communication with clarity.
- propose smart questions
- understand and dissecting the problem so that it is fully solved and understood
- demonstrate the assertiveness for his decision

(xxii) Teaching strategies to be used to develop these skills and abilities

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team



**d. Communication, Information Technology and Numerical Skills**

(xlv) Description of the skills to be developed in this domain.

- Enhancing the ability of students to use computers and internet.

(xlvii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Field visits to factories

(iii) Methods of assessment of students numerical and communication skills

- Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

**Description of the psychomotor skills to be developed and the level of performance required**

Upon successful completion of this course, the student is expected to be able to:

1. perform the laboratory experiments precisely
2. operate all devices in lab
3. Diagram growth curve of bacteria.
4. assemble and collect important bacterial isolates
5. Prepare different media
6. Cultivate the bacterial isolates
7. Carry out bacterial identification techniques.

(ii) Teaching strategies to be used to develop these skills

- Follow up students during preparing different media , isolation and cultivation of bacteria, carry out the laboratory experiments

(xlviii) Methods of assessment of students psychomotor skills

- Giving additional marks for preparing correct media, bacterial slides , good seminar presentation

**5. Schedule of Assessment Tasks for Students During the Semester**

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

**D. Student Support**



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**20. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

### E. Learning Resources

#### Required Text(s):

- Antibacterial chemotherapeutic agents, by Dax S. L.; Publisher: Blackie Academic Professional (1996).
- Russell, A. D. & Chopra I. (1996). Understanding antibacterial action resistance. Ellis Horwood

#### Recommended Reading List

#### Electronic Materials, Web Sites

Other learning material such as computer-based programs/CD, professional standards/regulations

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

#### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

#### 2. Computing resources

- Providing class rooms with computers and labs with data show.

#### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability different specific media and chemicals used for isolation.

### G Course Evaluation and Improvement Processes

#### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures

#### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.



<b>3. Processes for Improvement of Teaching</b> <ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
<b>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</b> <ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
<b>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</b> <ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Faculty member responsible for the course:

<b>Prepared by faculty staff:</b> <b>1.Dr. Hussein Hassan Abulreesh.</b> <b>2. Dr. Khaled Elbanna.</b> <b>3. Dr. Sameer Organji.</b>	<b>Signature:</b>
<b>Date Report Completed: 1.04.2018</b>	
<b>Revised by:</b> <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	<b>Signature:</b>
<b>Date: 1.04.2018</b>	
<b>Program Chair</b> <b>Dr. Hussein H. Abulreesh.</b>	<b>Signature:</b>
<b>Dean</b>	<b>Signature:</b>
<b>Date:</b>	

(4)- Haematology 4013321-3

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology.

**A Course Identification and General Information**

48. Course title <b>Haematology</b>
49. Course code: <b>4013321-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
50. Name of faculty member responsible for the course: <b>Prof. Hamed M. Mutwally</b> <b>Dr Zuhair Y. Alsahaff</b>
5. Level/year at which this course is offered: <b>3<sup>rd</sup> Year / Level 5</b>
6. Pre-requisites for this course (if any): <b>General Biology (4011012-4).</b>
7. Co-requisites for this course (if any):
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

After completing this course the student should be able to:

1. Define the haematology
2. Summarize the general functions of blood components
2. Differentiate between red blood cells and different types of white blood cells
4. Define the blood coagulation
5. List all diseases related to blood
6. Describe and differentiate different types of anaemia
7. Define transfusion science
8. Explain how blood transfusion works,

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course is designed to introduce students to the basic principles of haematology, coagulation and transfusion science. The course also will develop the students understanding of haematology as a specialized aspect of diagnostic pathology.

**Topics to be Covered**

Topic	No of Weeks	Contact hours
❖ <b>Introduction: to Haematology</b> - Definition of haematology - Importance of haematology - The components and importance of plasma	<b>1</b>	<b>2</b>
❖ <b>The red blood cells</b> - Formation - Function	<b>1</b>	<b>2</b>
❖ <b>The haemoglobin</b> Function, Normal abnormal rates - Blood grouping (ABO system)	<b>1</b>	<b>2</b>

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❖ Hematocrite , Reticulocytes, erythrocytes sedimentation rates: Definitions and clinical significance	2	4
❖ Anaemia : -concepts - classification -mechanisms - genetic defects of haemoglobins; refractory anaemia, .	2	4
❖ White Blood Cells (WBC) -Definition -classification -functions -WBC disorders (e.g. leukaemia)	2	4
Blood platelets - Definition - production - functions	2	4
Coagulation and transfusion science -normal haemostasis -normal response to vascular damage -causes of acquired and inherited coagulation defects -treatment and monitoring of anticoagulant -antibody detection in transfusion science -blood and blood products -complement related to blood group serology -hazards of transfusion	3	6
	14 weeks	28hrs

**2 Course components (total contact hours per semester):**

Lecture : 28	Tutorial:	Practical: 42	Other:
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
12h (reports & essay)

**4. Development of Learning Outcomes in Domains of Learning**

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate



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**learning outcomes in the domain concerned.**

**q. Knowledge : Description of the knowledge to be acquired**

Upon successful completion of this course The student will be able to:

1. Define the haematology
2. Summarize the general functions of blood components
2. Differentiate between red blood cells and different types of white blood cells
4. Define the blood coagulation
5. List all diseases related to blood
6. Describe and differentiate different types of anaemia
7. Define transfusion science
8. Explain how blood transfusion works,

**(ii) Teaching strategies to be used to develop that knowledge**

- ❖ The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- ❖ At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- ❖ All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- ❖ Using images and movies
- ❖ Encouraging students to collect the new information about haematology
- ❖ Availability of the reference books and scientific sites concerning the haematology in the internet.

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam (1) (10%)
- Periodical exam (2) (10%)
- Report and activity (10%)
- Mid- term theoretical exam (20%)
- Final exam (50%)

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

❖ Upon successful completion of this course The student will be able to:

1. Define the haematology
2. Summarize the general functions of blood components
2. Differentiate between red blood cells and different types of white blood cells
4. Define the blood coagulation
5. List all diseases related to blood
6. Describe and differentiate different types of anaemia
7. Define transfusion science
8. Explain how blood transfusion works,

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming



**-Discussion**

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

- At the end of the course, the student will be able to:
- 27. demonstrates professional attitudes and behaviors towards others.
- 28. demonstrate his capability for the responsibility and Accountability
- 29. show effective verbal communication with clarity.
- 30. propose the smart questions
- 31. understand and dissecting the problem so that it is fully understood and solved.
- 32. demonstrate the assertiveness for his decision
- 33. the ability to be self-motivated learners and responsive to feedback.
- 34. Ability to write a full scientific reports in the field of immunology
- 35. the application of ethical and professional standards in laboratory microbiological
- 36. to maintain the highest standards of quality in work, behaviour, appearance and respect for team
- 37. the ability to apply all safety standards and safety in microbiological laboratories

**(xxiii) Teaching strategies to be used to develop these skills and abilities**

- Through theoretical lectures
- through the field training in medical laboratories and hospitals.
- through the training in of food and dairy factories, environmental health control laboratories.
- Case Study
- Active learning
- Small group discussion

**(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of students presentations

**d. Communication, Information Technology and Numerical Skills**

**(xlix) Description of the skills to be developed in this domain.**

At the end of the course, the students

- will gain experience in effective communication skills by practicing, listening, reading, writing and speaking clearly.
- give short oral presentations of 5-8 minutes will be required of all students and will be given during a class period.
- will pick a immunology topic and discuss specific issues related to the topic.

<p>(i) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> <li>- Homework (preparing a report on some topics related to the course depending on web sites).</li> <li>- Seminars presentation</li> <li>- Practical during carryout the experiments in the lab.</li> </ul> <p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> <li>- Evaluation of presentations</li> <li>- Evaluation of reports</li> <li>- Practical exam</li> </ul>
<p>e. Psychomotor Skills (if applicable)</p> <p>7. Perform haematological tests.</p> <p>8. Use tools, kits, instruments that are used in haematological laboratories</p>
<p>(li) Teaching strategies to be used to develop these skills</p> <ol style="list-style-type: none"> <li>1. Case Study</li> <li>2. Active learning</li> <li>3. Small group discussion</li> </ol>
<p>(lii) Methods of assessment of students psychomotor skills</p> <ul style="list-style-type: none"> <li>• Evaluate the efforts of each student in preparing the report.</li> <li>• Evaluate the scientific values of reports.</li> <li>• Evaluate the work in team</li> <li>• Evaluation of students presentations</li> </ul>

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

21. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

2. Roitt, I. (2008) *Essential Haematology 8<sup>th</sup> edition*.

##### Recommended Reading List



**1. Hughes and Jones (2004) *Lecture Notes on Haematology 6<sup>th</sup> edition.***

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

Other learning material such as computer-based programs/CD, professional standards/regulations

**F. Facilities Required**

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

**1. Accommodation (Lecture rooms, laboratories, etc.)**

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

**2. Computing resources**

- Providing class rooms with computers and labs with data show.

**3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)**

**G Course Evaluation and Improvement Processes**

**1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching**

- Questionnaires
- Open discussion in the class room at the end of the lectures

**2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department**

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

**3. Processes for Improvement of Teaching**

- Preparing the course as PPT.
- Using scientific movies.
- Periodical revision of course content.

**4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)**

- After the agreement of Department and Faculty administrations

**5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**

- Periodical revision by Quality Assurance Units in the Department and institution

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Faculty member responsible for the course:

Prepared by faculty staff: <b>Prof. Hamed M. Mutwally.</b> <b>Dr Zuhair Y. Alsahaff.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Head of Program <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(5)- Immunology 4013372-3

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology.</b>

**A Course Identification and General Information**

51. Course title <b>Immunology</b> 52. Course code: <b>4013342-3</b>
2. Credit hours: <b>3hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
53. Name of faculty member responsible for the course: <b>Dr. Sameer Organji</b>
5. Level/year at which this course is offered: <b>3<sup>th</sup> Year / Level 6</b>
6. Pre-requisites for this course (if any): <b>Haematology (4013321-3).</b>
7. Co-requisites for this course (if any):
8. Location if not on main campus: <b>Main campus.</b>

**B Objectives**

After completing this course the student should be able to:

1. Define the immunology
2. Summarize the general functions of immune system
2. Differentiate between Innate immune system and Adaptive immune system
3. Understand why do we need an immune system?
4. Understand how does the immune system work efficiently and without killing us?
5. Define the vaccination
6. List the types of vaccines
5. Describe the methods used for vaccines production
7. Explain why we need the vaccination
- 8-Explain the physiology of the immune system,
9. list the beneficial role of the immune system
10. understand the concept and principal of organ transplantation
- 11-list the advantageous and complications of organ transplantation
12. Evaluate the methods for organ maintenance
13. Memorize the immune-related diseases
14. Discuss the mode of action of vaccines in the body.

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course is designed for students of applied microbiology to cover the basic aspects of immunology, a broad understanding of the immune system and its functions. Topics include: activation and regulation of innate and adaptive immunity and the principles governing vaccination; the molecular basis of antigen specificity; antibody structure and interaction with antigens; disorders of the immune system; transplantation immunology; the application of immunological reactions for the diagnosis and monitoring of disease; and the use of immunological techniques as analytical tools in the clinical laboratory.

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Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction: to the principle immunology -Definition of immunology - Historical background about the immunology -Roles of the scientists in this field -important expressions: Innate immune system, adaptive immune system Layered defense, Surface barriers, Natural killer cells.	1	2
❖ General functions of the immune system - Forms, size of immune cells - Immune system - Type of immune system	1	2
❖ Innate immune system: Surface barriers, Inflammation, Complement system, Cellular barriers, Natural killer cells. -Functions of innate immune system	3	6
❖ Adaptive immune system: also known as the acquired immune or, more rarely, as the specific immune system: Lymphocytes, Killer T cells, Helper T cells, Gamma delta T cells, B lymphocytes and antibodies). -Functions of innate immune system	3	6
❖ Vaccines : - principle of vaccination - Historical background about vaccines -Different Types of Vaccines: [Live, attenuated, Inactivated/Killed, Toxoid (inactivated toxin), Subunit/conjugate, Polysaccharide and polypeptide, Surface antigen (recombinant) vaccines] - Vaccines mode of action in the body.	3	6
❖ production of vaccines ❖ Traditional methods and the concept of the genetically engineered vaccines	1	2
Organ Transplantation - Definition of Organs Transplantation - Principles of Organs Transplantation - Types of Transplantation: - Complications Of Organ Transplantation (Rejection, Malignancy). - Sources of organs for transplantation - Methods for organ maintenance	2	4
	14 weeks	28hrs

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: -</b>	<b>Other:</b>

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

<p><b>4. Development of Learning Outcomes in Domains of Learning</b> <b>For each of the domains of learning shown below indicate:</b></p> <ul style="list-style-type: none"> <li>• <b>A brief summary of the knowledge or skill the course is intended to develop;</b></li> <li>• <b>A description of the teaching strategies to be used in the course to develop that knowledge or skill;</b></li> <li>• <b>The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</b></li> </ul>
<p><b>r. Knowledge : Description of the knowledge to be acquired</b></p> <p><b>Upon successful completion of this course The student will be able to:</b></p> <ol style="list-style-type: none"> <li><b>1. Define the immunology</b></li> <li><b>2. list the general functions of immune system</b></li> <li><b>3. memorize the components of <u>Innate immune system</u> and <u>Adaptive immune system</u></b></li> <li><b>4. Memorize the immune-related diseases</b></li> <li><b>5. define the vaccination</b></li> <li><b>6. outline the role of vaccination to protect the human body</b></li> <li><b>7. List the types of vaccines</b></li> <li><b>8. write the concept and principal of organ transplantation</b></li> <li><b>9. list the advantageous and complications of organ transplantation</b></li> <li><b>10. describe methods for organ maintenance</b></li> </ol> <p><b>(ii) Teaching strategies to be used to develop that knowledge</b></p> <ul style="list-style-type: none"> <li>❖ <b>The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.</b></li> <li>❖ <b>At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.</b></li> <li>❖ <b>All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.</b></li> <li>❖ <b>Using images and movies</b></li> <li>❖ <b>Encouraging students to collect the new information about immunology</b></li> <li>❖ <b>Availability of the reference books and scientific sites concerning the immunology in the internet.</b></li> </ul>

**(iii) Methods of assessment of knowledge acquired:**

- Periodical exam (1) (10%)
- Periodical exam (2) (10%)
- Report and activity (10%)
- Mid- term theoretical exam (20%)
- Final exam (50%)

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

❖ Upon successful completion of this course The student will be able to:

1. Differentiate between Innate immune system and Adaptive immune system
3. summarize why do we need an immune system?
4. Judge how does the immune system work efficiently and without killing us?
5. Explain why we need the vaccination
6. Explain the physiology of the immune system,
7. write the principal of organ transplantation
8. summarize the complications of organ transplantation
9. Evaluate the methods for organ maintenance
10. Memorize the immune-related diseases
11. Discuss the mode of action of vaccines in the body.

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- Lectures
- Brain storming
- Discussion

**(iii) Methods of assessment of students cognitive skills**

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

**c. Interpersonal Skills and Responsibility**

- At the end of the course, the student will be able to:
- 38. demonstrates professional attitudes and behaviors towards others.
- 39. demonstrate his capability for the responsibility and Accountability
- 40. show effective verbal communication with clarity.
- 41. propose the smart questions
- 42. understand and dissecting the problem so that it is fully understood and solved.
- 43. demonstrate the assertiveness for his decision
- 44. the ability to be self-motivated learners and responsive to feedback.
- 45. Ability to write a full scientific reports in the field of immunology
- 46. the application of ethical and professional standards in laboratory microbiological
- 47. to maintain the highest standards of quality in work, behaviour, appearance and respect for team

**48. the ability to apply all safety standards and safety in microbiological laboratories**

(xxiv) Teaching strategies to be used to develop these skills and abilities

- Through theoretical lectures
- through the field training in medical laboratories and hospitals.
- through the training in of food and dairy factories, environmental health control laboratories.
- Case Study
- Active learning
- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of students presentations

**d. Communication, Information Technology and Numerical Skills**

(liii) Description of the skills to be developed in this domain.

At the end of the course, the students

- will gain experience in effective communication skills by practicing, listening, reading, writing and speaking clearly.
- give short oral presentations of 5-8 minutes will be required of all students and will be given during a class period.
- will pick a immunology topic and discuss specific issues related to the topic.

(liv) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.

(iii) Methods of assessment of students numerical and communication skills

- Evaluation of presentations
- Evaluation of reports
- Practical exam

**e. Psychomotor Skills (if applicable)**

9. demonstrate professional attitudes and behaviors towards others.
10. Demonstrate his capability for the responsibility and Accountability
11. show Effective verbal communication with clarity.
12. propose the smart questions
13. understand and dissecting the problem so that it is fully solved understood.
14. demonstrate the assertiveness for his decision

(Iv) Teaching strategies to be used to develop these skills

1. Case Study
2. Active learning
3. Small group discussion

(Ivi) Methods of assessment of students psychomotor skills

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of students presentations

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	20 %
3	Mid Term Exam (practical)	9	30 min	10 %
4	Reports and essay	11	--	5 %
5	Final Practical Exam	15	60 min	15 %
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

22. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

1. Not book prepared by Dr. Sameer Organjii
2. E. Paul, William (2008) *Fundamental Immunology 6th edition*. Lippincott Williams & Wilkins.

#### Recommended Reading List

1. Male, David (2004) *Immunology 4<sup>th</sup> edition*. Mosby.

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

- <http://www.journals.elsevier.com/clinical-immunology/>

- <https://en.wikipedia.org/wiki/Immunology>

Other learning material such as computer-based programs/CD, professional standards/regulations



PPT prepared by Prof. Dr. Sameer Organjii

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## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

### 2. Computing resources

- Providing class rooms with computers and labs with data show.

### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

## G Course Evaluation and Improvement Processes

### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionaries
- Open discussion in the class room at the end of the lectures

### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Periodical revision of course content.

### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations.

### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution.

Faculty member responsible for the course:

Prepared by faculty staff: <b>Dr. Sameer Organjii.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Head of Program <b>Dr. Hussein Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(6)- Epidemiology 4014451-2

<b>Institution:</b> UM AL – QURA UNIVERSITY
<b>College/Department :</b> Faculty of Applied Science – Department of Biology.
<b>A Course Identification and General Information</b>
35. Course title <b>Epidemiology</b>
36. Course code: <b>4014451-2</b>
37. Credit hours: <b>2hrs</b>
38. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
39. Name of faculty member responsible for the course: <b>Dr. Sameer Organji (srorganji@uqu.edu.sa)</b>
40. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 7</b>
41. Pre-requisites for this course (if any): <b>Medical Microbiology (4013472-3)</b>
42. Co-requisites for this course (if any): <b>---</b>
43. Location if not on main campus: <b>Main campus.</b>

**B Objectives:**

❖ After completing this course student should be able to:
14. Understand and explain what epidemiology is and how it relates to other disciplines.
15. Understand and explain how epidemiology is used and applied.
16. Understand and be able to apply commonly used terms and methods of epidemiology.
17. Define and properly use terms to describe disease and disease transmission.

**C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):**

This course deals with basic epidemiologic concepts and approaches to population health issues in veterinary and human medicine. The course covers a wide spectrum of topics, some of which (e.g., outbreak investigation, properties of tests) will be treated in more depth, while others (e.g., epidemiologic study design) will be introduced, with more emphasis in subsequent courses.

<b>1 Topics to be Covered</b>		
Topic	No of Weeks	Contact hours
❖ Introduction: - An Historical Overview of epidemiology	1	2
❖ Principles of Epidemiology :	1	2
❖ Measuring Disease Frequency:	1	2
❖ Disease outbreak:	2	4
❖ Surveillance:	2	4
❖ Infectious disease epidemiology:	1	2
❖ Epidemiological Factors associated with hosts:	1	2
❖ Epidemiology factors of disease transmission :	2	4

❖ Environmental Epidemiology:	2	4
❖ Disease control and prevention:	1	2
	14 weeks	28hrs

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture : 28</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>

**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):**  
**12h (reports & essay).**

<b>4. Development of Learning Outcomes in Domains of Learning</b> For each of the domains of learning shown below indicate: <ul style="list-style-type: none"> <li>• A brief summary of the knowledge or skill the course is intended to develop;</li> <li>• A description of the teaching strategies to be used in the course to develop that knowledge or skill;</li> <li>• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.</li> </ul>	
<b>s. Knowledge : Description of the knowledge to be acquired</b>  Upon successful completion of this course The student will be able to: <ol style="list-style-type: none"> <li>1. Understand and explain what epidemiology is and how it relates to other disciplines.</li> <li>2. Understand and explain how epidemiology is used and applied.</li> <li>3. Understand and be able to apply commonly used terms and methods of epidemiology</li> <li>4. Define and properly use terms to describe disease and disease transmission.</li> </ol>	
<b>(ii) Teaching strategies to be used to develop that knowledge</b> <ul style="list-style-type: none"> <li>• The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.</li> <li>• At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.</li> <li>• All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.</li> <li>• Using images and movies</li> <li>• Encouraging students to collect the new information about what the new in epidemiology</li> <li>• Make the reference books and scientific sites concerning epidemiology in</li> </ul>	



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internet available.
<p>(iii) Methods of assessment of knowledge acquired:</p> <ul style="list-style-type: none"> <li>Periodical exam and reports 10%</li> <li>Mid- term theoretical exam 20%</li> <li>Mid-term practical exam 5%</li> <li>Final practical exam 15%</li> <li>Final exam 50%</li> </ul>
<p><b>b. Cognitive Skills</b></p> <p>(i) Cognitive skills to be developed</p> <p>Having successfully completed the course students should be able to:</p> <ol style="list-style-type: none"> <li>Understand and explain what epidemiology is and how it relates to other disciplines.</li> <li>Understand and explain how epidemiology is used and applied.</li> <li>Understand and be able to apply commonly used terms and methods of epidemiology</li> <li>Define and properly use terms to describe disease and disease transmission.</li> </ol> <p>(ii) Teaching strategies to be used to develop these cognitive skills:</p> <ul style="list-style-type: none"> <li>- Lectures</li> <li>-Brain storming</li> <li>-Discussion</li> </ul> <p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> <li>- Exam must contain questions that can measure these skills.</li> <li>- Quiz and exams</li> </ul> <p>Discussions after the lecture</p>
<p><b>c. Interpersonal Skills and Responsibility</b></p> <ul style="list-style-type: none"> <li>At the end of the course, the student will be able to:</li> </ul> <p>(xxv) Teaching strategies to be used to develop these skills and abilities</p> <p>(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> <li>Evaluate the efforts of each student in preparing the report.</li> <li>Evaluate the scientific values of reports.</li> <li>Evaluate the work in team</li> <li>Evaluation of the role of each student in lab group assignment</li> <li>Evaluation of students presentations</li> </ul>
<p><b>d. Communication, Information Technology and Numerical Skills</b></p> <p>(lvii) Description of the skills to be developed in this domain.</p> <p>At the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>Enhancing the ability of students to use computers and internet.</li> </ul>



- Interpret the laboratory data
- Know how to write a report.

(lviii) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).
- Seminars presentation
- Practical during carryout the experiments in the lab.

(iii) Methods of assessment of students numerical and communication skills

- 1- Evaluation of presentations
- 2- Evaluation of reports
- 3- Practical exam

e. Psychomotor Skills (if applicable)

(ii) Teaching strategies to be used to develop these skills

(lix) Methods of assessment of students psychomotor skills

#### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20%
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
Total Marks				100%

#### D. Student Support

23. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

#### E. Learning Resources

##### Required Text(s):

- (1)- Rothman, Kenneth. J. (2012) *Epidemiology An Introduction 2<sup>nd</sup> edition*. Oxford University Press.
- (2)- Brownson, Ross. C. Petitti, Diana. B. (2006) *Applied Epidemiology Theory and*

*Practice 2<sup>nd</sup> edition. Oxford University Press.*

### Recommended Reading List

Electronic Materials, Web Sites (eg. Web Sites, Social Media, Blackboard, etc.)

Other learning material such as computer-based programs/CD, professional standards/regulations

- PPT prepared by Dr. Samir Organjii.

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

#### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

#### 2. Computing resources

- Providing class rooms with computers and labs with data show.

#### 3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability all kits for identification of pathogen bacteria
- Availability of VITEK device for rapid identification of the pathogen bacteria.

### G Course Evaluation and Improvement Processes

#### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires
- Open discussion in the class room at the end of the lectures.

#### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

#### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

#### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations.

**5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**

- **Periodical revision by Quality Assurance Units in the Department and institution.**

**Faculty member responsible for the course:**

Prepared by faculty staff: <b>1. Dr. Sameer Organji.</b> <b>2. Dr. Khaled Elbanna.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean	Signature:
Date:	

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(7)- Bioinformatics 4014182-2

Institution: <b>UM AL – QURA UNIVERSITY</b>
College/Department : <b>Faculty of Applied Science – Department of Biology.</b>

A Course Identification and General Information

54. Course title <b>Bioinformatics</b>
55. Course code: <b>4014082-2</b>
2. Credit hours: <b>2hrs</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
56. Name of faculty member responsible for the course: Associate <b>Prof. Dr. Gamal Osman</b>
5. Level/year at which this course is offered: <b>4<sup>th</sup> Year / Level 8</b>
6. Pre-requisites for this course (if any): ---- <b>Biotechnology (4014401-3).</b>
7. Co-requisites for this course (if any): ---
8. Location if not on main campus: <b>Main campus.</b>

B Objectives

The course is designed to introduce the most important and basic concepts, methods, and tools used in Bioinformatics. Topics include (but not limited to) bioinformatics databases, sequence and structure alignment, protein structure prediction, protein folding, protein-protein interaction. Emphasis will be put on the understanding and utilization of these concepts and algorithms. The objective is to help the students to reach rapidly the frontier of bioinformatics and be able to use the bioinformatics tools to solve the problems on their own research.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

This course aims to give the student an idea of Bioinformatics

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Bioinformatics databases (Introduction)	1	1
❖ Bioinformatics databases (Nucleotide sequence databases)	1	1
❖ Bioinformatics databases (Protein sequence databases)	1	1
❖ Bioinformatics databases (Sequence motif databases)	1	1
❖ Bioinformatics databases (Protein structure databases)	1	1
❖ Bioinformatics databases (Other relevant databases)	1	1

❖ Alignment (Types of divergence and Conserved regions)	2	2
❖ Alignment (Structure alignment)	1	1
❖ Alignment (Insertion/deletion scores)	1	1
❖ Alignment ( Database search)	2	2
❖ Alignment (Multiple alignment)	2	2
❖ Alignment (Similarity and Homology)	1	1
❖ Alignment (Matching algorithms)		
❖ Alignment (Searching 3D Databases)		
❖ Alignment (Classifying 3D shapes)		
❖ Designing (primer, synthetic gene, protein affinity and specificity )		
	15	15

2 Course components (total contact hours per semester):

Lecture : 15	Tutorial:	Practical: 45	Other:
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3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week):  
12h (reports & essay)

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

t. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course, the student:

- ❖ (1) - to make DNA alignment and comparison.
- ❖ (2) - to make protein alignment and comparison.
- ❖ (3) - the ability to designing primer or synthetic genes.
- ❖ (4) - to be familiar with different database for DNA and protein.

(ii) Teaching strategies to be used to develop that knowledge

- Lectures which must start with preliminary one showing course contents
- Using images and movies

- Encouraging student to collect the new information about cells
- Enable the reference books and scientific sites concerning cancer cells in internet.

(iii) Methods of assessment of knowledge acquired:

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

**b. Cognitive Skills**

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

- thinking and give information about the DNA nucleotide sequence
- give information about the different data base dealing with DNA and protein.

(ii) Teaching strategies to be used to develop these cognitive skills:

- Through lectures, videos and some training of their laptops which introduced to the students to enable them to understand the DNA sequence and protein sequence
- Demonstrate the different types of alignments.

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.

**c. Interpersonal Skills and Responsibility**

(xxvi) Description of the interpersonal skills and capacity to carry responsibility to be developed

- student should be able to obtain knowledge by himself from different sources
- the student is encouraged to work in a team.

(xxvii) Teaching strategies to be used to develop these skills and abilities

- Open class discussions with students for minutes during lectures and labs.
- Students (as groups and individuals) should give reports concerning certain topics of the course.

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.

**d. Communication, Information Technology and Numerical Skills**

(Ix) Description of the skills to be developed in this domain.

- Enhancing the ability of students to use computers and internet.

(Ixi) Teaching strategies to be used to develop these skills

- Homework (preparing a report on some topics related to the course depending on web sites).

(iii) Methods of assessment of students numerical and communication skills

- Evaluation the efforts of students in preparing the reports and referring the references.

**e. Psychomotor Skills (if applicable)**

Description of the psychomotor skills to be developed and the level of performance required

Students should be able to:

- Practice the basic Lab. Skills
- Use light microscope in accuracy.
- Preparing microscopic slides

(ii) Teaching strategies to be used to develop these skills

- Follow up students during preparing slides, examination and isolation.

(Ixi) Methods of assessment of students psychomotor skills

- Giving additional marks for preparing microscopic slides

### 5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	Periodical Exam (s)	4	15 min	10 %
2	Mid Term Exam (Theoretic)	8	60 min	30 %
3	Mid Term Exam (practical)	--	--	--
4	Reports and essay	11	--	20 %
5	Final Practical Exam	--	--	--
6	Final Exam	16	120 min	40 %
Total Marks				100%

### D. Student Support

24. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs.

### E. Learning Resources

#### Required Text(s):

- (1)- Bioinformatics Algorithms: An Active Learning Approach (Paperback)  
by Phillip Compeau (Goodreads Author) (shelved 3 times as bioinformatics)  
avg rating 5.00 — 55 ratings — published 2014
- (2)- Understanding Bioinformatics (Paperback)  
by Market Zvelebil (shelved 3 times as bioinformatics)  
avg rating 3.45 — 71 ratings — published 2007
- (3)- Sequence Alignment: Methods, Models, Concepts, and Strategies (Hardcover)  
by Michael S. Rosenberg (Goodreads Author) (Editor) (shelved 3 times as bioinformatics)
- (4)- Computational Molecular Biology: An Algorithmic Approach (Hardcover)  
by Pavel A. Pevzner (shelved 1 time as bioinformatics)  
avg rating 3.33 — 23 ratings — published 2000
- (5)- Introduction to Bioinformatics (Paperback)  
by Arthur M. Lesk (shelved 7 times as bioinformatics)  
avg rating 3.75 — 159 ratings — published 2002

Other learning material such as computer-based programs/CD, professional standards/regulations

- **PPT prepared by Prof. Dr. Gamal Osman**

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
  - **Class room is already provided with data show**
  - **The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.**
2. Computing resources
  - **Providing class rooms with computers and labs with data show.**
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
  - **Availability of some reference**
  - **Availability new light microscopes**
  - **Availability different chemicals will be used for slides preparation.**

## G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
  - **Questionaries**
  - **Open discussion in the class room at the end of the lectures**
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
  - **Revision of student answer paper by another staff member.**
  - **Analysis the grades of students.**
3. Processes for Improvement of Teaching
  - **Preparing the course as PPT.**
  - **Using scientific movies.**
  - **Coupling the theoretical part with laboratory part**
  - **Periodical revision of course content.**
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)
  - **After the agreement of Department and Faculty administrations**
- 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
  - **Periodical revision by Quality Assurance Units in the Department and institution.**

Faculty member responsible for the course:

Prepared by faculty staff: <b>1. Prof. Gamal E. H. Osman.</b> <b>2. Dr. Khaled Elbanna .</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
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Date:	

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## Research Project 4013953-3

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY.</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Biology.</b>
<b>A Course Identification and General Information</b>
57. Course title <b>Research Project.</b>
58. Course code: <b>4013953-3</b>
2. Credit hours: <b>3hrs.</b>
3. Program(s) in which the course is offered. : <b>BSc Microbiology.</b>
4. Name of faculty member responsible for the course: <b>Course coordinator: Dr. Hesham A. Malak (<a href="mailto:hemalak@uqu.edu.sa">hemalak@uqu.edu.sa</a>)</b> <b>All Teaching staff members (Microbiology).</b>
5. Level/year at which this course is offered: <b>3<sup>th</sup> Year / Summer semester.</b>
6. Pre-requisites for this course (if any): <b>--</b>
7. Co-requisites for this course (if any): <b>---</b>
8. Location if not on main campus: <b>Male campus.</b>

## B Objectives

After completing this course student should be able to:

1. Gain practical and/or theoretical knowledge about particular area of microbiology.
2. Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project.
3. Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature.

## C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

At the end of this course student should be able to evaluate the different approaches used and suggest future experiments or alternative strategies for addressing the problem. The student should be able to conversant with writing a scientific report and presenting scientific data in a clear accessible manner. The skills learnt will be applicable to problem solving exercises encountered in all types of employment.

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
Introduction to research project	1	1
Where and how I start ?: Thinking of research ideas, Purpose of research, Research questions or hypothesis, Are these questions/hypothesis feasible to achieve?, Problems with research questions/hypothesis, research title.	2	6



<b>Project preparing: Project management, project timeline, project ethics</b>	<b>1</b>	<b>2</b>
<b>The literature review: Primary and secondary sources, quality of sources, Your literature review should tell a story, how to make it a story?, Speed reading and taking notes, Critical awareness while reading, How to search for information, Managing references, Various style of referencing systems.</b>	<b>2</b>	<b>9</b>
<b>Research methodology I: Research design, Research approach, building your way from research purpose, to question, to approach, to data gathering.</b>	<b>1</b>	<b>3</b>
<b>Methodology II: Types of research methods: experimental, Case studies, Cross-sectional studies, Longitudinal studies, surveys, Comparative studies, How to structure and write up your methodology?</b>	<b>1</b>	<b>3</b>
<b>Results analysis: Types of results, comparative analysis, statistical analysis, results presentation (tables, graphs, figures)</b>	<b>1</b>	<b>3</b>
<b>Concluding and writing up: Writing a discussion, writing a conclusion, writing an abstract and finalizing the title, general points about writing a research/review article and presentation coda</b>	<b>1</b>	<b>3</b>
<b>Set up a small project at (laboratory or field) parallel with theoretical lectures, for each student or a group of three students to begin to implement theoretical ideas on the ground (small training research point), collecting their own actual data, analyzing, representing the collected data, commenting, and critical discussing it and writing an essay about it. This essay will be revised by supervisor and critically discussed with the student/students group by examiners board (usually two departmental scientific staff members).</b>	<b>All weeks</b>	<b>Open time</b>

**2 Course components (total contact hours per semester):**

<b>Lecture : 30 hrs</b>	<b>Tutorial:</b>	<b>Practical: Open Time</b>	<b>Other:</b>
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**3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay).**

#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessments to be used in the course to evaluate learning outcomes in the domain concerned.

##### u. Knowledge : Description of the knowledge to be acquired

(i) Upon successful completion of this course the student will be able to:

1. Gain practical and theoretical knowledge about particular area of Microbiology.
2. Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project.
3. Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature.

(ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important microorganisms in different applications and human service.
- At the end of the program, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies.
- Encouraging students to collect the new information about what the new in biochemistry.
- Enable the reference books and scientific sites concerning biology in internet.

(iii) Methods of assessment of knowledge acquired:

- Submission of a literature review.
- Submission of research report.

##### b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

- Displaying and organizing different types of data. Representing the data.

(ii) Teaching strategies to be used to develop these cognitive skills:

- Reading relevant research and review articles.
- Brain storming.
- Discussion.

**(iii) Methods of assessment of students cognitive skills**

- **Submission of a literature review.**
- **Submission of research report.**

**c. Interpersonal Skills and Responsibility**

At the end of the course, the student will be able to:

1. **Gain practical and theoretical knowledge about particular area of microbiology.**
2. **Work independently on the research project under the supervision of academic member of staff, and should be able to design experiments to answer the particular question posed, and critically analysed the results. There will be scope for initiative in this element of the project.**
3. **Be able to set the work in the context of work done by other experimentalists, and provide a concise summary of relevant literature.**

**(xxviii) Teaching strategies to be used to develop these skills and abilities**

- Lab work.
- Case Study.
- Active learning.
- Small group discussion.

**(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- **Evaluate the efforts of each student in preparing the report.**
- **Evaluate the scientific values of reports.**
- **Evaluate the work in team.**
- **Evaluation of the role of each student in lab group assignment.**
- **Evaluation of students presentations.**

**d. Communication, Information Technology and Numerical Skills**

**(lxiii) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:**

**16. Enhancing the ability of students to use computers and internet.**

**17. Interpret biostatistics data**

**18. Present biochemical data.**

**19. Know how to write a report.**

**20. Teaching strategies to be used to develop these skills**

**13. Homework (preparing a report on some topics related to the course depending on web sites).**

**14. Seminars presentation.**

**15. Field visits.**

**(iii) Methods of assessment of students numerical and communication skills**

**10. Evaluation of presentations.**

**11. Evaluation of reports.**

**12. Practical exam.**

**e. Psychomotor Skills (if applicable)**

At the end of the course, the student will be able to:

**(ii) Teaching strategies to be used to develop these skills**

**(iii) Methods of assessment of students psychomotor skills**

### 5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Writing a literature review	7	30%
2	Participation / discussion / set up of small research project	All weeks	25%
3	Writing a brief proposal for a graduation project	15	45%
	<b>Total Marks</b>		<b>100%</b>

### D. Student Support

**25. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)**

**Office hours: 10 hrs.**

### E. Learning Resources

#### Required Text(s):

**Writing Scientific Research Articles: Strategy and Steps. 2nd Edition.**

by Margaret Cargill , Patrick O'Connor, ISBN-13: 978-1118570708. 2013. Wiley-Black Well Press.,

**Enjoy Writing Your Science Thesis or Dissertation: A Step by Step Guide to Planning and Writing a Thesis or Dissertation for Undergraduate and Graduate Science Students. 2nd Edition** by Elizabeth M Fisher, Richard C Thompson. ISBN-13: 978-1783264216. 2014. Imperial College Press.

#### Recommended Reading List

#### Electronic Materials, Web Sites

[www.columbia.edu/cu/biology/ug/research/paper.html](http://www.columbia.edu/cu/biology/ug/research/paper.html)

<https://www.youtube.com/watch?v=0oAFVHb21HM>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3474301/>

Other learning material such as computer-based programs/CD, professional standards/regulations

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

#### 1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

#### 2. Computing resources

- Providing class rooms with computers and labs with data show.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

#### G Course Evaluation and Improvement Processes

##### 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaires.
- Open discussion in the class room at the end of the lectures.

##### 2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

##### 3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part.
- Periodical revision of course content.

##### 4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations.

##### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution.

Faculty member responsible for the course:

Prepared by faculty staff: 1. Dr Hussein H. Abulreesh. 2. Professor Shady M. ElShehawy.	Signature:
Date Report Completed: 1.04/2018	
Revised by: 1. Professor Shady M. ElShehawy. 2. Professor Khaled A. Elbanna. 3. Dr. Hussein H. Abulreesh.	Signature:
Date: 1.04.2018	
Program Chair: Dr. Hussein H. Abulreesh.	Signature:
Dean	Signature:
Date:	

## Practical Field Training 4014953-4

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Institution: <b>Unm Al-Qura University</b>	Date of Report: <b>Revised April 2018</b>
College: <b>Faculty of Applied Science</b>	Department: <b>Department of Biology</b>
Program: <b>BSc Microbiology (40101)</b>	Track: <b>N/A</b>

### A. Field Experience Course Identification and General Information

1. Field experience course title and code: <b>Practical Field Training (4014953-4)</b>		
2. Credit hours (if any): <b>4 C. H.</b>		
3. Name and title of faculty or teaching staff member responsible for the field experience: <b>BSc Microbiology program</b>		
4. Dates and times field experience activities: a. Dates: <b>Summer semester (June – September)</b> b. Times: <b>Full time placement for three months (08.00 – 1600 hr) five days a week</b>		
5. Level or year of the field experience: <b>Final year after successful completion of all courses.</b>		
6. List names, addresses, and contact information for all field experience locations: <b>The choice of place of field experience location is based on students' interests. There are three major options to chose from;</b> <b>(1)- Clinical laboratories training</b> <b>(2)- Public health / environmental health laboratories</b> <b>(3)- Food, dairy, water factories and pharmaceutical factories (quality control laboratories)</b> <b>The locations listed below are just an example</b>		
<b>Name and Address of the Organization</b>	<b>Name of Contact Person</b>	<b>Contact Information (email address or mobile)</b>
<b>(A)- National Water Company</b>		
<b>(B)- Environmental Health Administration (Makkah City Municipality)</b>		
<b>( C )- Clinical laboratories under Ministry of Health management</b>		
<b>(D)- Saudi water Company</b>		
<b>(E)- Food Industry Companies</b>		
<b>(F)- Bottled Water Companies</b>		
<b>(G)- Saudi Food and Drug Authority</b>		
<b>(H)- Pharmaceutical companies</b>		



## B. Objectives and Learning Outcomes

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**(1)- Objectives of Field Experience:** The objective of this compulsory course is to provide extensive field training to the students to in their area of interest to develop practical training, skill development and to expose them in the field of work.

**(2)- Learning outcomes of Field Experience:** It is expected that at the end of the training completion, students will:

- Develop practical knowledge and skill in his chosen area.
- Become familiar with various method used in industry, and will know the role of microbiologist.
- Get familiar with practical problems during field condition and to overcome it.
- Able to decide their job prospects in various practical domains where microbiologist can contribute.
- Be able to develop research problem for higher studies.
- Developed skill to coordinate team work and to report individually.

**(3)- Development of learning outcomes:** The Course is indented increase the practical knowledge to the students and to increase their job prospects in industry and other domain where microbiologist can contribute significantly.

Strategies include training of students in good job oriented organization and or \research laboratory in collaboration with in university or outside for enhancing practical training. Field work report/Training report submitted by student in standard format will be evaluated.

## C. Description of Field Experience Activity

**1. Describe the major student activities taking place during the field experience.**

**(A)- For clinical field training option:**

- (1)- Work on how to analyze clinical specimens microbiologically
- (2)- Work on how to analyze clinical samples (biochemistry, blood analysis, serologically)
- (3)- Applying Quality assurance issues at clinical laboratories
- (4)- Practicing infection control issues

**(B)- For public health / environmental health field training option:**

- (1)- Work on analyzing food and water samples collected from food outlets microbiologically
- (2)- practice hygiene inspection methods at food outlets
- (3)- Practice hygiene inspection methods at hair saloons
- (4)- Practice sample collection from food outlets and water supplies for microbiological evaluation

**( C )- For food / dairy / bottled water / pharmaceutical factories option:**

- (1)- Practice microbiological quality control issues for raw material used in production
- (2)- Practice microbiological quality control issues for production lines
- (3)- Practice microbiological quality control issues post production prior to market distribution.

**2. List required assignments, projects, and reports: After the completion of training:**

**(A)- Written report (15 %)**

**(B)- Seminar (Departmental) (20 %)**

**( C )- Written quiz (20 %)**

**(D)- Oral discussion (20 %)**



**3. Follow up with students: (What arrangements are made to collect student feedback?)**

An academic staff member will visit the students at their training locations twice a month (total 6 visits) to meet them and listen to their feedback, and evaluate their experience. In the same visit the staff member will meet the person in charge of their training and discuss with them all issues related to the students (attitude, learning progress, commitment, etc). These follow ups are part of the overall assessment of the course.

**4. Insert a field experience flowchart for responsibility and decision-making (including a provision for conflict resolution).**

5. Supervisory Responsibilities			
	Student	Field Teaching Staff	Program Faculty and Teaching Staff
<b>Student Activities</b>			
a. Transport to and from site	✓		
b. Demonstrate learning Outcome performance	✓		
c. Completion of required tasks, assignments, reports, and projects	✓		
<b>Supervision Activities</b>			
a. Field site – safety		✓	
b. Student learning activities		✓	✓
c. Learning resources		✓	
d. Administrative issues (attendance)		✓	✓
<b>Planning Activities</b>			
a. Student activities		✓	✓
b. Learning experiences		✓	
c. Learning resources		✓	
d. Field site preparations		✓	✓
e. Student guidance and support		✓	✓
<b>Assessment Activities</b>			
a. Student learning outcomes		✓	✓
b. Field experience		✓	✓
c. Field teaching staff		✓	✓
d. Program faculty and teaching staff		✓	✓
e. Field site		✓	✓
f. Learning resources		✓	✓
a. Explain the student assessment process:			
Assessment process:			
(1)- Field assessor evaluate students learning progress, attendance, attitude, overall ability to handle real-life work issues			
(2)- Academic teaching staff (during visits) evaluates students feedback and feedback from Field assessor.			
(3)- After completion of training faculty staff members will assess students by written reports,			





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**knowledge quizzes, seminar presentation skills, oral discussion.**

**b. Explain the resolution of differences process (If the field teaching staff and the program faculty and teaching staff share responsibility for student assessment, what process is followed for resolving differences between them?)**

### **D. Planning and Preparation**

#### **1. Identification of Field Locations**

<b>List Requirements for Field Site Locations (IT, equipment, labs, rooms, housing, learning resources, clinical, etc.)</b>	<b>List Safety Standards</b>	<b>List Specialized Criteria</b>
a.		
b.		
c.		
d.		
e.		

**Explain the decision-making process used to determine appropriate field experience locations:**  
**All field experience locations are well-known governmental or private hospital, institutions and establishments. Most of which are long-term partners given that the program has started since the 1980s and there are strong links between the program and these locations. Some of the program graduates are holding different positions at these locations.**

#### **2. Identification of Field Staff and Supervisors**

<b>List Qualifications</b>	<b>List Responsibilities</b>	<b>List Training Required</b>
a.		
b.		
c.		
d.		

**Explain the decision-making process used to determine appropriate field staff and supervisors.**  
**Supervision of students are divided between field assessor (someone who work at the place of field experience) and academic teaching staff. We do not have the authorities to chose the field assessor since that is completely decided by the management of the institutions/establishment where students are having their training. The academic teaching staff who is supervising the students undertaking field training are all PhD holders.**

#### **3. Identification of Students**

<b>List Pre-requisite Requirements</b>	<b>List Testing Requirements</b>	<b>List Special Training Required</b>
a.		
b.		
c.		
d.		

**Explain the decision-making process used to determine that a student is prepared to enroll in field experience activities:**



All students undertaking field training must have successfully completed all their courses, however, there are pre-requisites for each training option:

- (1)- Clinical training requires the completion of: Medical Microbiology, Immunology, Haematology, Parasitology and Biochemistry courses.
- (2)- Public health / environmental health training option requires the completion of: Water and wastewater microbiology, Food Microbiology, Food quality control, Environmental Microbiology courses
- (3)- Food, Dairy, bottled water factories training option requires the completion of: Water and wastewater microbiology, Food Microbiology, Food quality control, courses

#### 4. Safety and Risk Management

List Insurance Requirements	List Potential Risks	List Safety Precautions Taken	List Safety Training Requirements
a.			
b.			
c.			
d.			

Explain the decision-making process used to protect and minimize safety risks.

All students undertaking field training will be getting brief description of some of safety issues at their work place, and the field assessor will train them to adhere to the rules and regulations of safety issues at each location.

5. Resolution of Differences in Assessments. If supervising staff in the field location and the faculty from the institution share responsibility for student assessment, what is the process followed to resolve differences?

#### E. Evaluation of the Field Experience

1. Describe the evaluation process and list recommendations for improvement of field experience activities by:

##### a. Students

- Describe evaluation process
- List recommendations for improvement

##### b. Supervising staff in the field setting

- Describe evaluation process
- List recommendations for improvement

##### c. Supervising faculty from the institution

- Describe evaluation process
- List recommendations for improvement

##### d. Others (e.g. graduates, independent evaluator, etc.)

- Describe evaluation process
- List recommendations for improvement

#### 2. Action Plan for Next Semester/Year



<b>Actions Recommended for further improvement (list from E.1. above)</b>	<b>Intended Action Points (should be measurable)</b>	<b>Start Date</b>	<b>Completion Date</b>	<b>Person Responsible</b>
a.				
b.				
c.				
d.				
e.				

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Prepared by faculty staff: <b>1. Dr. Hussein H. Abulreesh.</b>	Signature:
Date Report Completed: <b>1.04.2018</b>	
Revised by: <b>1. Dr. Khaled Elbanna.</b> <b>2. Dr. Hussein H. Abulreesh.</b> <b>3. Dr. Shady M. ElShehawy.</b>	Signature:
Date: <b>1.04.2018</b>	
Program Chair <b>Dr. Hussein H. Abulreesh.</b>	Signature:
Dean	Signature:
Date:	





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## (E)- Faculty Requirements

### (1) General Chemistry 1 4021101-4

**Institution:** Umm Al-Qura University.

**College/Department:** Faculty of Applied Sciences / Chemistry Department

#### A. Course Identification and General Information

<b>1. Course title and code:</b> General Chemistry 1, 4021101-4
<b>2. Credit hours:</b> Four (3 theoretical + 1 practical) hrs.
<b>3. Program(s) in which the course is offered (If general elective available in many programs indicate this rather than list programs):</b> Chemistry Industrial Chemistry Physics Medical Physics Biology Microbiology Mathematics
<b>4. Name of faculty member responsible for the course:</b> Prof. Mohamed Ismail Awad
<b>5. Level/year at which this course is offered:</b> 1 <sup>st</sup> / 1
<b>6. Pre-requisites for this course (if any):</b> -----
<b>7. Co-requisites for this course (if any):</b> -----
<b>8. Location if not on main campus:</b> -----

#### B. Objectives

<b>1. Summary of the main learning outcomes for students enrolled in the course.</b> This course is an introductory chemistry course designed to prepare students for college level chemistry courses. The course introduces some basic principles of physical, organic and inorganic chemistry.
<b>2. Briefly describe any plans for developing and improving the course that are being implemented.</b> (eg increased use of IT or web based reference material, changes in content as a result of new research in the field). The use of teaching intelligent classes for lectures. Encourage students to prepare reports in general topics in chemistry. The use of information technology or the Internet in order to increase awareness of the concepts of chemistry. Link the theoretical and practical sides of the course to help the students to understand and interpret the properties of the chemical compounds.



**C. Course Description:** (Note: General description in the form to be used for the Bulletin or Handbook should be attached).

1. Topics to be Covered		
Topic	No of Weeks	Contact hours
Units of measurements; SI- units, intensive and extensive properties, uncertainty in measurements (precision and accuracy).	1	3
Significant figures: Rounding significant figures, Using significant figures in addition, subtraction, multiplication and divisions.	1	3
States of matter and measurement, molecules and molecular compounds.	2	6
The periodic table, nomenclature, electronic structure of atoms, simple periodic properties of the elements.	2	6
Chemical bonding, molecular geometry, and properties of various states of matter.	1	3
Ions and ionic compounds, chemical reaction types.	1	3
Stoichiometry, atomic and molecular weights.	1	3
The mole, simple quantitative calculations with chemical reactions.	1	3
Basics of chemical equilibrium.	1	3
Acids and bases.	1	3
Thermochemistry.	1	3
Hydrocarbons, nomenclature and simple reactions.	1	3

#### Laboratory Experiments Outline

Topics to be Covered		
List of Experiments	No of Weeks	Contact hours
The practical part includes the following experiments:		
Introduction	1	3
Density and viscosity of liquids.	1	3
Compound type (polar – nonpolar – ionic).	1	3
Chemical reactions.	1	3
Acids and bases and pH measurements and calculations.	1	3
Titration of vinegar.	1	3
Oxidation-reduction reactions.	1	3
Molar mass of acid.	1	3
Qualitative analysis (acidic and basic radicals).	1	3
Collegative properties (determination of molecular weight).	1	3
Determination of the heat capacity of the calorimeter.	1	3
Determination of the critical solution temperature of phenol - water system	1	3
Review	1	3
Final Exam.	1	3

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<b>2. Course components (total contact hours per semester):</b>			
<b>Lecture:</b> 42	<b>Tutorial:</b> ---	<b>Practical/Fieldwork/Internship:</b> 42	<b>Other</b> :

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<b>3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week) - 28 hours (2 hrs per week office hrs).</b>
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<b>4. Development of Learning Outcomes in Domains of Learning</b> For each of the domains of learning shown below indicate: A brief summary of the knowledge or skill the course is intended to develop; A description of the teaching strategies to be used in the course to develop that knowledge or skill. The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
--

Knowledge			
	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0			
1.1	Knows International system of units	Lectures Scientific discussion Library visits Web-based study	Exams portfolios long and short posters lab ma
1.2	Familiar with the laws that describe the behavior of ideal gases.		
1.3	Knows atom structure		
1.4	Describe types of solids.		
1.5	Mention the first law of thermodynamics.		
1.6	List the factors affecting equilibrium position and equilibrium concentration.		
2.0	Cognitive Skills		
2.1	Summarize gases laws	Lectures Scientific discussion homework assignment containing problem thinking activities	1. Midterm ex 2. quizzes 3. Final exam
2.2	Compare between ideal and real gases		
2.3	Apply Hess's law for the calculation of heat of reaction.		
2.4	Apply Faraday's laws for calculating the amount deposited at electrodes		
2.	Predict the spontaneity of chemical reaction.		

5				
3.0	<b>Interpersonal Skills &amp; Responsibility</b>			<b>2</b>
	Manage resources, time and collaborate with members of the group. Ability to work independently to handle Chemicals and perform laboratory illustrations safely. Ability to communicate results of work to classmates. Ability to work in a team to perform a specific task	Team work groups General discussion with students for solving a problem.	Assessment of the solution of problems submitted by the students.	<b>0</b>
				<b>1</b>
				<b>8</b>
4.0	<b>Communication, Information Technology, Numerical</b>			
	Work effectively both in a team, and independently on solving chemistry problems. Communicate effectively with his lecturer and colleagues Use university library and web search engines for collecting information and search about different topics .	Write a Report Use libraries	Evaluation of the report presented	
5.0	<b>Psychomotor</b>			
5.1	<b>NOT APPLICABLE</b>			
5.2				

<b>5. Schedule of Assessment Tasks for Students During the Semester:</b>			
<b>Assessment</b>	<b>Assessment task (eg. essay, test, group project, examination etc.)</b>	<b>Week due</b>	<b>Proportion of Final Assessment</b>
<b>1</b>	<b>Class activities, Attendances and Duties</b>	<b>Throughout the Term</b>	<b>10%</b>
<b>2</b>	<b>Mid-Term Exam (s)</b>	<b>5-14</b>	<b>20%</b>
<b>3</b>	<b>Lab Activity and Final Exam on Lab</b>	<b>Throughout the Term</b>	<b>30%</b>
<b>4</b>	<b>Final Exam</b>	<b>End of the Term</b>	<b>40%</b>
<b>5</b>	<b>Total</b>		<b>100%</b>

#### D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Presence of faculty members to provide counselling and advice.  
Office Hours: weekly during working hours, and to create appropriate means.  
Academic Advising for students to those who need it, and taking into account the appropriate test for that Member.

#### E Learning Resources

1. Required Text(s)  
*P. Atkins and J. de Paula, Physical Chemistry, 10<sup>th</sup> ed., 2006, New York.*

2. Essential References B. S. Bahl, Essential of physical chemistry, S. Chand & Co. , 1995, New Delhi, India. G. Rakshi, Physical Chemistry, 1995. J. E. Brady, and J. E. Humiston, General Chemistry Principles and Structure, 5 <sup>th</sup> edition, 1990, JohnWiley & Sons.	2 0 1 8
3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Chemistry, R. Chang, 10 <sup>th</sup> Edition, McGraw-Hill Higher Education, 2011.	
4. Electronic Materials, Web Sites etc Power point lectures.	
5. Other learning material such as computer-based programs/CD, professional standards Microsoft PowerPoint, Microsoft Word	

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Classroom capacity (60) students. To supply the classrooms with the appropriate educational means.
2. Computing resources Hall is equipped with a computer and Data Show and TV.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) None

#### G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular. Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor Observations and the assistance of colleagues. Independent evaluation for extent to achieve students the standards. Independent advice of the duties and tasks.
3 Processes for Improvement of Teaching Workshops for teaching methods. Continuous training of member staff. Review of strategies proposed. Providing new tools for learning. The application of e-learning. Exchange of experiences internal and external.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Check marking of a sample of exam papers, or student work. Exchange corrected sample of assignments or exam basis with another staff member



for the same course in other faculty.

**5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**

**Periodic Review of the contents of the syllabus and modify the negatives.**

**Consult other staff of the course.**

**Hosting a visiting staff to evaluate of the course.**

**Workshops for teachers of the course.**

**Faculty or Teaching Staff: Professor Mohamed Awad.**

**Signature:**

**Date Report Completed: March 2016.**

**Received by: Dr Hatem Altass Department Head**

**Signature: \_\_\_\_\_ Date: \_\_\_\_\_**

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## (2) Calculus 4041101-4

<b>Institution</b>	<b>Umm Al-Qura University.</b>
<b>College/Department</b>	<b>Faculty of Applied Science/ Department of Mathematical Science.</b>

### A. Course Identification and General Information

<b>1. Course title and code: Calculus(I) (4041101-4).</b>			
<b>2. Credit hours 4 Hours.</b>			
<b>3. Program(s) in which the course is offered.</b> BSc. Mathematics (If general elective available in many programs indicate this rather than list programs)			
<b>4. Name of faculty member responsible for the course</b> *****			
<b>5. Level/year at which this course is offered</b> First year/first semester			
<b>6. Pre-requisites for this course (if any)</b> Non			
<b>7. Co-requisites for this course (if any)</b>			
<b>8. Location if not on main campus</b> Al-Abdia Campus			
<b>9. Mode of Instruction (mark all that apply)</b>			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	100
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	
c. e-learning	<input type="checkbox"/>	What percentage?	
d. Correspondence	<input type="checkbox"/>	What percentage?	
f. Other	<input type="checkbox"/>	What percentage?	

### B Objectives

<b>1. What is the main purpose for this course?</b> <p style="text-align: center;">By the end of the course the students will be able to</p> <ul style="list-style-type: none"> <li>- use the concepts of introductory calculus</li> <li>-have concise and authoritative definitions of mathematical terms</li> <li>-solve linear equations and inequalities</li> <li>-solve quadratic equations and inequalities</li> <li>-evaluate the limit of functions.</li> <li>-find derivatives of functions using theorems and rules.</li> <li>-extend the concept of limits to infinity.</li> <li>-differentiate implicit and explicit functions .</li> <li>-study a function :where it goes, how it evolves, studying its monotonicity and critical points, concavity and inflexion points</li> <li>-integrate functions</li> </ul>
<b>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</b>

1. Encouraging students to collect problems from web based reference material and supervise classroom discussions.
2. Update references used in teaching process.
3. Use e-learning facilities more efficiently.
4. Use computer packages for solving exercise

**C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)**

**1. Topics to be Covered**

List of Topics	No. of Weeks	Contact Hours
Real numbers, Exponents and Radicals, Polynomials: Basic Operations and Factoring . Solving Equations, Rational Expressions: Basic Operations, Inequalities, Absolute Values.	3	12
Definition of Functions(Domain and Range), Graphs of Functions, Operations on Functions, Trigonometric Functions and Identities	2	8
Introduction to Limits, Theorems on limits, Limit from Right and from Left, Definition of Continuity	2	8
Definition of Derivative (Using Limits), Rules and Theorems for Finding Derivatives, Derivative of Trigonometric Functions, Chain Rule, Higher Order Derivatives, Implicit Differentiation	3	12
Maxima and Minima, Monotonicity, Local Maxima and Minima, Concavity, Sketching the Graphs	2	8
Integration of Functions, Definite Integrals	2	8

**2. Course components (total contact hours and credits per semester):**

	Contact Hours				Self-Study	Other	Total
	Lecture	Tutorial	Laboratory	Practical			
Contact Hours	56	-	-	-	-	-	56
Credit	4						4

**3. Additional private study/learning hours expected for students per**

4 Hours

**4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy**

NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
--	----------------------------------	------------------------------

1.0	Knowledge		
1.1	Define the related basic scientific facts, concepts, principles and techniques calculus	Lectures Tutorials Discussion Problem Solving	Exams Home work.
1.2	Recognize the relevant theories and their applications in basic mathematics.		
2.0	Cognitive Skills		
2.1	Representing problems mathematically.	Lectures Tutorials Solve Problem Brain Storming	Exams Quizzes. Homework. Discussion
2.2	How to distinguish different rules in calculus.		
3.0	Interpersonal Skills & Responsibility		
3.1	Develop connections of calculus with other disciplines	Cooperative education Competitive education	Home work. Reports. Quizzes. Discussion
	Solve problems using a range of formats and approaches in basic science		
3.2	show the ability to work independently and within groups.		
4.0	Communication, Information Technology, Numerical		
4.1	Learn how to summarize lectures or to collect materials of the course.	Lectures tutorials brain storming	Home work. Reports. Discussion
4.2	Learn how to solve difficulties in learning: solving problems – enhance educational skills		
5.0	Psychomotor		
Not applicable			

<b>5. Schedule of Assessment Tasks for Students During the Semester</b>			
<b>No.</b>	<b>Assessment task</b>	<b>Week due</b>	<b>Proportion of Final Assessment</b>
<b>1</b>	<b>Midterm 1</b>	<b>6<sup>th</sup> week</b>	<b>10 %</b>
<b>2</b>	<b>Midterm 2</b>	<b>12<sup>th</sup> week</b>	<b>10 %</b>
<b>3</b>	<b>Homework + reports + Quizzes</b>	<b>During semester</b>	<b>20%</b>
<b>4</b>	<b>Final exam</b>	<b>End of semester</b>	<b>50 %</b>

#### D. Student Academic Counseling and Support

**1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)**

**1- Office hours per week in the lecturer schedule (6 hours per week).**

**2- Contact with students by e-mail, SMS, and e-learning facilities.**

#### **E. Learning Resources**

##### **1. Required Text(s)**

**Mathematics for preparatory year program, Book1, Oxford University Press, 2013**

##### **2. Essential References**

**Calculus (Ninth Edition) by Dale Varberg, Edwin Purcell and Steven Rigdon**

##### **3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List):**

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##### **4. Electronic Materials, Web Sites etc**

**<http://en.wikipedia.org/wiki/Calculus>**

##### **5. Other learning material such as computer-based programs/CD, professional standards/regulations: Maple**

#### **F. Facilities Required**

**Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)**

##### **1. Accommodation (Lecture rooms, laboratories, etc.)**

**-Classroom with capacity of 25-students.**

**- Library.**

##### **2. Computing resources:**

**Not available**

##### **3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list):**

**None**

#### **G Course Evaluation and Improvement Processes**

##### **1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:**

- **Student feedback through electronic facilities organized by the deanship of registration and acceptance.**

##### **2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department**

- **Evaluation of the teachers by internal & external faculty members.**
- **Visiting to the classrooms.**
- **Mutual visits between colleagues and giving advices to each other after each lecture**

##### **3 Processes for Improvement of Teaching**

- **Analysis of student course evaluation and feedback**

- Peer evaluation and feedback
- Review of course portfolios
- Workshops on pedagogical methods

**4. Processes for Verifying Standards of Student Achievement** (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Analysis of course assessments by other reviewers on a periodic basis.

**5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**

- Material and learning outcomes are periodically reviewed internally and externally.
- Comparing course content and teaching methodologies with similar courses offered at other departments and universities.
- Studying the outcomes of the students' evaluations of the course and use it to improve teaching strategies.

**Faculty or Teaching Staff:**

Signature: \_\_\_\_\_ Date Report Completed: \_\_\_\_\_

Received by: \_\_\_\_\_ Dean/Department Head  
Signature: \_\_\_\_\_ Date \_\_\_\_\_

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### (3) General Physics 4031101-4

<b>Institution:</b> <b>UM AL – QURA UNIVERSITY</b>
<b>College/Department :</b> <b>Faculty of Applied Science – Department of Physics.</b>
<b>A Course Identification and General Information</b>
<b>59. Course title</b> <b>General Physics.</b>
<b>60. Course code:</b> <b>4031101-4.</b>
<b>2. Credit hours:</b> <b>4hrs</b>
<b>3. Program(s) in which the course is offered. :</b> <b>BSc Physics.</b>
<b>4. Name of faculty member responsible for the course:</b> <b>One of the academic staff member.</b>
<b>5. Level/year at which this course is offered:</b> <b>1<sup>st</sup> Year / Level 2.</b>
<b>6. Pre-requisites for this course (if any):</b>
<b>7. Co-requisites for this course (if any):</b> ---
<b>8. Location if not on main campus:</b> <b>Main campus and Alzaher.</b>

### **B Objectives**

**After completing this course student should be able to:**

1. Define the concepts of the measurements.
2. Define the concepts measuring length.
3. Define the concepts of measuring time.
4. Define the concepts of measuring weight.
5. Differentiate between the distance, the position, and the displacement.
6. Differentiate between the speed and the velocity.
7. Differentiate between the average velocity and the instantaneous velocity.
8. Define the concepts of the acceleration.
9. Differentiate between the average acceleration and the instantaneous acceleration.
10. Differentiate between the linear acceleration and the free fall acceleration.
11. Differentiate between the vectors and the scalars
12. Analyze the vectors into their components.
13. Calculate the multiplication of the vectors.
14. Define the concepts of the force.
15. Define the relation between the force and the acceleration.
16. Apply Newton's laws of motion.
17. Differentiate between the Work and the Energy.
18. Differentiate between the Energy and the power.
19. Define the Kinetic energy of the body.
20. Define the concept of the density of the body.
21. Define the concept of the pressure within the fluid.
22. Define the concept of Pascal principle.
23. Define the concept of Archimedes' principle.
24. Define the concept of Bernoulli's Equation.



25. Define the concept of the temperature
26. Differentiate between the Celsius Scale and Fahrenheit scale of temperature.
27. Define the laws of reflection through plane mirrors and spherical mirrors.
28. Define the laws of refraction through thin lenses.
29. Apply the laws of thin lenses.

In addition to these items, the students should gain practical skills through performance some experimental class.

**C. Course Description** (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of physics, such as measurements, work and energy, Newton's laws, heat, fluid mechanics, and light. This course will provide a conceptual and experimental background in physics sufficient to enable students to take courses that are more advanced in related fields.

**1 Topics to be Covered**

Topics	No of Weeks	Contact hours
<b>❖ Measurement</b> <ol style="list-style-type: none"> <li>1- The physical quantities, standards, and Units.</li> <li>2- The international system of units.</li> <li>3- The Standard of time</li> <li>4- The Standard of length</li> <li>5- The Standard of Mass</li> <li>6- Precision and significant figures.</li> <li>7- Dimensional analysis.</li> </ol>	1	3
<b>❖ Vectors</b> <ol style="list-style-type: none"> <li>1- Vectors and Scalars.</li> <li>2- Adding vectors : graphical methods</li> <li>3- Components of vectors.</li> <li>4- Adding vector: component method.</li> <li>5- Multiplications of vectors.</li> <li>6- Vector laws in physics.</li> </ol>	2	6
<b>❖ Motion in one dimension</b> <ol style="list-style-type: none"> <li>1- Particles kinematics.</li> <li>2- Description of motion</li> <li>3- Average velocity</li> <li>4- Instantaneous velocity.</li> <li>5- Accelerated motion.</li> <li>6- Motion with Constant Acceleration</li> <li>7- Freely falling Bodies.</li> <li>8- Measuring free fall acceleration.</li> </ol>	1	3



<b>❖ Motion in two and three dimensions</b> 1- Position, velocity, and acceleration. 2- Motion with constant acceleration 3- Projectile motion 4- Uniform circular motion 5- Velocity and acceleration vectors in circular motion	1	3
<b>❖ Force and motion</b> 1- Position, velocity, and accelerations 2- Motion with constant acceleration. . 3- Newtons first and second laws. 4- Forces. 5- Newtons second law 6- Newton's third law. 7- Units of force 8- Weight and mass 9- Measuring forces 10- Applying Newton's laws.	2	6
<b>❖ Work and Energy</b> 1. Work done by constant force. 2. Work done by a variable force: one dimensional case. 3. Work done by a variable force: two dimensional case. 4. Kinetic energy and work-energy theory. 5. Power.	1	3
<b>❖ Fluids Statics</b> 1. Fluids and Solids 2. Density and pressure. 3. Variation of density in a fluid at rest. 4. Pascal Principle. 5. Archimedes' Principle. 6. Surface tension.	1	3
<b>❖ Fluid dynamics</b> 1. General concepts of fluid flow 2. Streamlines and the equation of continuity. 3. Bernoulli's Equation 4. Application of Bernoulli's Equation 5. Viscosity.	1	3
<b>❖ Temperature, Heat and the first law of Thermodynamics.</b> 1. Heat: Energy in transit 2. Heat capacity and specific heat. 3. Heat capacity of solids 4. Temperature. 5. The Celsius and Fahrenheit Scales. 6. Heat transfer.	2	6

❖ <b>Reflection and refraction of light at plane surface</b> 1. Reflection and Refraction 2. Deriving the law of reflection 3. Image formation by plane mirrors. 4. Deriving the law of refraction. 5. Total internal reflection.	1	3
❖ <b>Reflection and refraction of light at plane surface</b> 1. Spherical mirrors 2. Spherical refracting surfaces. 3. Thin lenses 4. Compound optical systems 5. Optical instruments	1	3
❖ <b>Exercises and Solved problems</b>	1	3
	15 weeks	45hrs

<b>2 Course components (total contact hours per semester):</b>			
<b>Lecture : 45</b>	<b>Tutorial:</b>	<b>Practical: 42</b>	<b>Other:</b>

### Practical part:

1. Safety and Security at the lab.
1. Introduction.
2. Precise measurements.
3. Vectors.
4. Determination of specific gravity.
5. Determination of Surface tension of a liquid.
6. Determination of viscosity of a liquid.
7. Determination of sound velocity in air.
8. Determination of refractive index of a Prism.
9. Determination of the melting point of wax.
10. Verification of lens formula.
11. Verification of mirrors formula.
12. Determination of specific heat.

<b>3. Additional private study/learning hours expected for students per week. (This should be an average : for the semester not a specific requirement in each week):</b> 6 Office hours to help students for solving assigned problems
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#### 4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

#### v. **Knowledge** : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

- 1- Understanding the principle and concepts of physics.
- 2- Applying the physics law to different environmental situation.
- 3- Improving logical thinking.
- 4- Using mathematical formulation to describe the physical principle or phenomena
- 5- Ability to explain how things are working.
- 6- Teaching strategies to be used to develop that knowledge
- 7- Demonstrating the basic information and principles through lectures and the achieved applications
- 8- Discussing phenomena with illustrating pictures and diagrams
- 9- Lecturing method:
  - a. Blackboard
  - b. Power point
  - c. e-learning
- 10- Tutorials
- 11- Revisit concepts
- 12- Discussions
- 13- Brain storming sessions
- 14- Start each chapter by general idea and the benefit of it;
- 15- Learn the student background of the subject;
- 16- Show the best ways to deal with problem;
- 17- Keep the question "why" or "how" to explain always there  
Build a strategy to solve problem.

#### (ii) **Teaching strategies to be used to develop that knowledge**

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important physics law in different applications.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in

Physics.

- Enable the reference books and scientific sites concerning Physics in internet.

**(iii) Methods of assessment of knowledge acquired:**

- Solve some example during the lecture.
- Exams:
  - Quizzes
  - Short exams (mid term exams)
  - Long exams (final)
  - Homework.
  - Activities.
- Discussions with the students.
- Ask the student to clear the misunderstanding of some physical principle.
- Ask quality question.

**b. Cognitive Skills**

**(i) Cognitive skills to be developed**

Having successfully completed the course students should be able to:

- 1- Define the physical phenomena.
- 2- Apply the laws of physics.
- 3- Analyse the physical phenomena.
- 4- Express the physical phenomena mathematically.
- 5- Doing small researches

**(ii) Teaching strategies to be used to develop these cognitive skills:**

- 1- Preparing main outlines for teaching
- 2- Following some proofs
- 3- Define duties for each chapter
- 4- Home work assignments
- 5- Encourage the student to look for the information in different references
- 6- Ask the student to attend lectures for practice solving problem

**(iii) Methods of assessment of students cognitive skills**

- 1- Midterm's exam. Exams, short quizzes
- 2- Asking about physical laws previously taught
- 3- Writing reports on selected parts of the course
- 4- Discussions of how to simplify or analyze some phenomena

**c. Interpersonal Skills and Responsibility**

At the end of the course, the student will be able to:

- Work independently.
- The students learn independently and take up responsibility.

**(xxix) Teaching strategies to be used to develop these skills and abilities**

- 1- Search through the internet and use the library.
- 2- Lab work.
- 3- Case Study.
- 4- Small group discussion.

- 5- Enhance educational skills.
- 6- Develop their interest in Science through :( lab work, field trips, visits to scientific and research.
- 7- Encourage the student to attend lectures regularly
- 8- Give students tasks of duties

**(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility**

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

**d. Communication, Information Technology and Numerical Skills**

**21. Description of the skills to be developed in this domain. At the end of the course, the student will be able to:**

1. Enhancing the ability of students to use computers and internet.
2. Interpret Physical phenomena.
3. Present Physical phenomena orally.
4. Know how to write a report.
5. Computation
6. Problem solving
7. Data analysis and interpretation.
8. Feeling physical reality of results

**22. Teaching strategies to be used to develop these skills**

16. Homework (preparing a report on some topics related to the course depending on web sites).
17. Seminars presentation
18. Field visits

**(iii) Methods of assessment of students numerical and communication skills**

13. Evaluation of presentations
14. Evaluation of reports
15. Practical exam
16. Homework.
17. Final exams.
18. Research.

**e. Psychomotor Skills (if applicable)**

**(ii) Teaching strategies to be used to develop these skills**

- Follow up students the students in lab and during carryout all physical experiments.

**19. Methods of assessment of students psychomotor skills**

**5. Schedule of Assessment Tasks for Students During the Semester**

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exercises & Home works	All weeks	10 %
2	Participation in activities lectures and labs	All weeks	10 %
3	Written Test (1)	6 <sup>th</sup> week	10%
4	Written Test (2)	11 <sup>th</sup> week	10%
5	Final Exam (Practical)	15 <sup>th</sup> week	20%
6	Final Exam (theoretical)	16 <sup>th</sup> week	40%

**D. Student Support**

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)  
Each student will supervise by academic adviser in physics Department and the time table for academic advice were given to the student each semester.

**E. Learning Resources**

**Required Text(s):**

Physics, 4<sup>th</sup> edition , By: Halliday, Resnick, and Krane, Wiley (1992)

**Recommended Reading List**

University Physics with modern Physics, 13th edition, by: Hugh D. Young and Roger A. Freedman, Addison-Wesley, (2012).

**Electronic Materials, Web Sites**

(eg. [www.youtube.com](http://www.youtube.com).)

**Other learning material such as computer-based programs/CD, professional standards/regulations**

**F. Facilities Required**

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

**1. Accommodation (Lecture rooms, laboratories, etc.)**

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
- Library
- Laboratory for fundamental of physics

**2. Computing resources**

- Computer room

- Scientific calculator.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

#### G Course Evaluation and Improvement Processes

<p><b>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching</b></p> <ul style="list-style-type: none"> <li>• Questionnaires</li> <li>• Open discussion in the class room at the end of the lectures</li> </ul>
<p><b>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department</b></p> <ul style="list-style-type: none"> <li>• Revision of student answer paper by another staff member.</li> <li>• Analysis the grades of students.</li> </ul>
<p><b>3. Processes for Improvement of Teaching</b></p> <ul style="list-style-type: none"> <li>• Preparing the course as PPT.</li> <li>• Using scientific movies.</li> <li>• Coupling the theoretical part with laboratory part</li> <li>• Periodical revision of course content.</li> </ul>
<p><b>4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</b></p> <ul style="list-style-type: none"> <li>• After the agreement of Department and Faculty administrations</li> </ul>
<p><b>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</b></p> <ul style="list-style-type: none"> <li>• Periodical revision by Quality Assurance Units in the Department and institution</li> </ul>

Date: 13 December 2017

Head of the Physics Department

*Dr. Hatem Alamri*

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#### (4) Organic Chemistry (4022301-4)

<b>Institution:</b> Umm Al-Qura University	<b>Date of Report:</b> 2017
<b>College/Department :</b> Faculty of Applied Science/ Department of Chemistry	

##### A. Course Identification and General Information

1. Course title and code: Chemistry (4022301-4)		
2. Credit hours: 4 (3+1)		
3. Program(s) in which the course is offered: Biology program.		
4. Name of faculty member responsible for the course: Organic Chemistry staff members		
5. Level/year at which this course is offered: 3 <sup>th</sup> level/3 year (1 <sup>st</sup> term).		
6. Pre-requisites for this course (if any): General chemistry (4021101-4).		
7. Co-requisites for this course (if any): -----		
8. Location if not on main campus: -----		
9. Mode of Instruction (mark all that apply)		
a. Traditional classroom	<input type="checkbox"/>	What percentage? <input type="checkbox"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage? 100%
c. e-learning	<input type="checkbox"/>	What percentage? <input type="checkbox"/>
d. Correspondence	<input type="checkbox"/>	What percentage? <input type="checkbox"/>
f. Other	<input type="checkbox"/>	What percentage? <input type="checkbox"/>
Comments:		

##### B Objectives

1. What is the main purpose for this course? By the end of this course students study well aware of basic concepts of organic chemistry including partitioning and naming organic compounds and physicochemical properties of knowledge
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) -Using smart classrooms for teaching lectures. -Encourage students to work in organic chemistry of aliphatic library or using the Internet (self-teaching) Self Study.

##### C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours



Definition of organic compounds: Bonds, formula, hybridization	1	3
Division of organic compounds and functional groups	1	3
Stereochemistry: Definition of isomerism – Types of isomerism	2	6
Hydrocarbons: Aliphatic and aromatic compounds	1	3
Alkanes and cycloalkane	1	3
Alkenes	1	3
Alkynes	1	3
Organic halides compounds	1	3
Ethers and Hydroxyl compounds	1	3
Amines	1	3
Carbonyl compounds (Aldehydes and Ketones)	2	6
Carboxylic acids and their derivatives	1	3

### Practical Part:

- Identifying of hydrocarbons (Benzene, toluene, naphthalene and anthracene)
- Identifying of hydroxyl compounds (methanol, ethanol, glycerol and phenols)
- Identifying of aldehydes (formaldehyde, acetaldehyde and benzaldehyde)
- Identifying of ketones (acetone)
- Identifying of amines (urea and aniline)
- Identifying of carboxylic acids (formic, acetic, oxalic, tartaric, citric, salicylic and benzoic acids).

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	42	-		33		75
Credit	3	-		1		4

3. Additional private study/learning hours expected for students per week.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Division of various organic compounds according to functional groups	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Scientific discussion</li> <li>• Library visits</li> </ul>	<ul style="list-style-type: none"> <li>• Exams</li> <li>• web-based student performance systems</li> </ul>
1.2	Learn about the different types of functional groups		
1.3	Various organic compounds naming system alioabak and common way		
1.4	Lists different reagents used in organic reactions of different		

1.5	Type outputs, chemical reactions correctly	• Web-based study	• portfolios • long and short essays • posters lab manuals
1.6	Knowledge and understanding of mechanical reactions lab.		
1.7	Explanation and interpretation of the outputs of organic chemical reactions		
1.8	Choose different reagents for conversions between the organic compounds		
1.9	Scientific discussions and work in small groups.		
1.10	Use the library to do research on some topics of aliphatic chemistry.		
1.11	The use of the Internet in some reports of organic compounds preparation methods		
2.0	Cognitive Skills		
2.1	Development of skill reverse thinking (thinking back) and that the student acquires the skill training in the selection of appropriate methods to prepare any organic compound	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Student acquires the skill of predicting the course of a reaction and determining the path based on the functional group.		
2.3	The student acquires the skill of how to discuss the complex and unpredictable behaviour during interaction.		
2.4	The student can choose appropriate methods to prepare various organic compounds		
2.5	Design different ways of preparation of functional groups in organic compounds		
2.6	Innovate the student different ideas for construction of several aliphatic compounds		
2.7	The student plans to work a research programme in the field of organic chemistry aliphatic according to steps.		
2.8	The student selects the appropriate mechanical to chemical reaction		
2.9	Generate debate and discussion in the classroom.		
2.10	Examples given in the lecture and exercise under the supervision of teaching workshops		
2.11	Give some practical issues and assigning students by creating a strategic plan for the solution		
2.12	Encourage the transmission of learning using analysis tools in various applications and through discussion of potential applications in other areas.		
2.13	Assigning students homework assignments that include open task designed to apply the forecasting skills, analysis and problem solving.		
3.0	Interpersonal Skills & Responsibility		
3.1	The division of students collectively for teams to make some common reports	Lectures Scientific discussion Web-based study	Exams web-based student performance systems
3.2	Self-reliance and take individual responsibility and the ability to work within the group		
3.3	Development of student opinion accepts his share to make an effective presentation topic is related to the decision and evaluate results to discover the extent to which students		

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	collective cooperation.		
4.0	Communication, Information Technology, Numerical		
4.1	Use of computer in research synthesis that help write reports on topics relevant to the decision. Computer and Internet usage in the sources of recent research relevant to the decision.	<ul style="list-style-type: none"><li>• Lectures</li><li>• Scientific discussion</li><li>• Library visits</li><li>• Web-based study</li></ul>	<ul style="list-style-type: none"><li>• web-based student performance systems</li><li>• individual and group presentations</li></ul>
4.2	<ul style="list-style-type: none"><li>-Use computer lab.</li><li>-Visit Central Library</li><li>-Visit of research centres.</li><li>-Use international information network.</li></ul>		
4.3	<ul style="list-style-type: none"><li>- Ask questions tests an interpretation of statistical information.</li><li>- Assessment of the duties associated with the appropriate use of communication skills and numerical.</li><li>-Allocate part of the ratings to assess the level of ICT usage in render.</li></ul>		
5.0	Psychomotor		
5.1	NOT APPLICABLE		
5.2			

#### 5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam	5-14	20%
2	Assignments (Homework + Activities+ Attendance)		10
3	Practical Exam	15	30%
4	Final Exam	16	40%

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide advice and guidance.
- Office hours: during the hours the weekly and the creation of appropriate means.
- Academic advising for students who need it, and test the appropriate member.

#### E. Learning Resources

### 1. List Required Text books

- Aliphatic Organic Chemistry, Amit Arora, Discovery Publishing House , 2006
- Organic chemistry, by Graham Solomons TW, Craig B Fryhle, 8th ed., 2007.
- Organic Chemistry, by J. McMurry, 6th ed., Brooks/Cole Publishing Company(2003).
- Introductory Organic Chemistry , Amit Arora, Discovery Publishing House, (2006).

### 2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

### 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Organic chemistry, Jonathan Clayden, Nick Greeves and Stuart Warren, 2nd ed., Oxford University Press, USA, 2012.
2. Organic chemistry, T.W. Graham Solomons and Craig Fryhle, 9th ed., Wiley, 2007.
3. Organic Chemistry, by J. McMurry, 6th ed., Brooks/Cole Publishing Company, 2003.
4. Stereochemistry, R K Sharma, Discovery Publishing House, 2007.
1. Introductory Organic Chemistry , Amit Arora, Discovery Publishing House, (2006).
2. Organic Stereochemistry, Robinson, Oxford University Press, New Delhi, 2005.

### 4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- <http://www.chemweb.com>
- <http://www.sciencedirect.com>
- <http://www.rsc.org>

### 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

### 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.
- Providing hall of teaching aids including computers and projector.

### 2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computer and projector and TV.

### 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

## G Course Evaluation and Improvement Processes

### 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

### 2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Observations and the assistance of colleagues.



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- Independent evaluation for extent to achieve students the standards.
- Independent advice of the duties and tasks.

### 3 Processes for Improvement of Teaching

- Workshops for teaching methods.
- Continuous training of member staff.
- Review of strategies proposed.
- Providing new tools for learning.
- The application of e-learning.
- Exchange of experiences internal and external.

### 4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

### 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff:

Signature:

Date Report Completed: 2017

Received by:

Department Head

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

