هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

Environmental Microbiology (CLS 481)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution:Shaqra University	Date:
College/Department :: College of Applied Medical Sciences-Laboratory Dept	

A. Course Identification and General Information

1. Course title and code:Environmental Microbiology(CLS 481)
2. Credit hours:3 (2 +1)
3. Program(s) in which the course is offered. Clinical Laboratory (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course **Prof. Dr. Intisar ElhagElrayah**
5. Level/year at which this course is offered:Level 8
6. Pre-requisites for this course (if any):CLS365
7. Co-requisites for this course (if any):
8. Location if not on main campus:Dawadmi
9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course is designed to help the students achieve a number of broad objectives. At the end of the course/module, the student is able to:

a) Describe microbial evolution

b) Explain interactions within and between microbial populations in terms of parasitism, predation, competition, commensalism, synergism and mutualism

c) Describe, in ecological terms, the interactions between microorganisms and plants, and microorganisms with animals

d) Describe production of biofuels

e) Discuss various forms of biocontrol

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)
3. Feedbacks from the previous course report.
4. Reference to student evaluation results.
5. Increased use of IT or web-based reference material.
6. Regular updating of the course objectives and scientific content as required.
7. Utilization of various internet resources that offer informative details to support the lecture course material.
8. Utilization materials on the website that could be accessed by students.
9. Tutorial, reading assignments and relevant research papers using university online library will enrich the scope of the course.
10. Use of Power point (ppt) or Multimedia Presentation.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

This course is designed to provide the students with an understanding of the vital activities that microorganisms perform in nature and in the broader dimension of organic activities in the total ecosystem. Students will learn about the useful and harmful roles of microorganisms in the food and dairy industries. The use of microorganisms in industrial processes, the treatment of waste materials and microbial quality controls will also be discussed.

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1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours

Week	Time (Hour)	Theory	Week	Practical
1	1	Course enrollment and registration	Time (Hour)	
2	1	Introduction to environmental microbiology Fundamentals of microbial ecology- Characteristics of microbial ecosystems, microorganisms and their ability to cause changes; Adaptation	2	Microorganisms in the air- Air sampling – Indoors / outdoors, exposure plates, different duration of exposures
3	1	Microbial evolution Microbial interactions include:neutralism, mutualism, comensalism, antagonism, competition, parasitism and predation	2	Aerosols : Bacteriological laboratory techniques that create aerosols, sneeze effect
4	1	Development of microbial communities Measurement of biomass and microbial activity	2	Environmental sampling from surfaces – Rodac plate, swab
5	1	Epidemiology of infectious diseases: Terminology, disease reservoirs, modes of transmission, and public health measures for the control of epidemics	2	Examination of water – Recreational water, drinking water. Microbial analysis of water – Most Probable Number
5	1	First Midterm Examination	2	Microbial analysis of milk – Standard plate count

7	1	Nosocomial infections: : Predisposing factors, endogenous and exogenous infections, sources, control measures	2	Microbial analysis of milk continued … Reductase test, Phosphatase test, Brucella Ring test
8	1	Environmental sanitation: Types of sewer lines, treatment of sewage, sewage transmitted diseases	4	Food spoilage microbiology: Enumeration of food spoilage organisms (some fruits and vegetables)
9&10	2	Air Microbiology– Indoor and outdoor air, airborne diseases and its transmission, control of microorganisms in the air	4	Estimation of viable count of microbial flora in meat and meat by-products. Estimation of coliforms counts in meat and meat by-products
11	1	Water sources, microbial content of water, pollution of water	4	Isolation of pathogens in foods
12	1	Second Midterm Examination	4	Identification methods of isolated pathogens
13	1	Food Microbiology: Microorganisms involved in the spoilage of different types of food and milk. Food borne diseases continued … Infection, intoxication; prevention and control of food borne diseases	2	Final Examination (Practical)
14	1	Laboratory acquired infections: Classification of organisms into Risk groups, safety precautions when handling each Risk group, hazardous laboratory techniques and processes	2	Final Examination (Theory)
15	2	Final Examination (Practical)	4	Isolation of pathogens in foods
16	2	Final Examination (Theory)	4	Identification methods of isolated pathogens

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	15		30			45
	Actual						
Credit	Planed						
	Actual	15		15			30

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

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The National Qualification Framework provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). Second, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. Third, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe microbial evolution and development of microbial communities	(a) Interactive lectures used to enrich students' knowledge. (b) Reading from the textbooks, related articles, medical journalsand related websites. (c) Discussion to enhance their understanding and used to improve students' intellect and skills. d) Power point/Multimedia Presentation (d) CD/Video viewing (f) Large Group Discussion Online assignment/Assigned Homework	((a) Paper and Pencil Tests (b) Baseline Assessments (c) Oral Reports (d) Interviews (e) Multiple choice questions (f) Open-book examinations and Closed-book examinations (g) Tests and quizzes (h) Assignments (i) Final written examination at the end of semester
1.2	Illustrate biogeochemical cycles and identify the roles of specific groups of microorganisms associated with each cycle		
1.3	Describe		
1.4	Explain interactions within and between microbial populations in terms of parasitism, predation,competition,commensalism, synergism and mutualism		
1.5	Describe, in ecological terms, the interactions between microorganisms and plants, and microorganisms with animals		
1.6	Develop media for the isolation of environmental bacteria		
2.0	**Cognitive Skills** **At the end of the course, the student will be able to**		
2.1	Collect samples from terrestrial and aquatic environments	((a) Interactive Lecture/Discussion (b) Report Back Session (c) Power point/Multimedia Presentation (d) CD/Video viewing (f) Large Group Discussion (g) Reading (h) Online assignment/Assigned Homework	(a) Paper and Pencil Tests (b) Demonstration (c) Role Play (d) Lab report (e) Prepare an illustrated manual on using the equipment (f) Observation of real or simulated professional practice (g) Final written examination at the end of semester
2.2	Describe production of biofuels Discuss		
3.0	**Interpersonal Skills & Responsibility**		
3.1	work constructively in a group, cooperating with their leaders and seniors and with other students,	(a) work and Solving problems in small and	(a) Attendance of students are recorded for the lectures
3.2			

	thus initiating the value of teamwork and compliance to work through systems;	large groups during tutorial to Increase and enforce Interpersonal Skills (b) Give students projects on topics related to the subject. (c) Encouraging students to communicate among themselves under instructor guidance. (d) Encouraging students to perform a collaborative projects on topics related to the subject. (e) Developing self-study skills by encouraging students to use internet and library recourses.	and the percentage of the actual attendance is calculated. (b) Academic Advising from teaching staff for each students. (c) Examinations including oral, written and practical examinations. (d) Grading homeworkassignments.
3.3	develop self-learning for the acquisition of greater knowledge, new information data or technique in the field of course for the best utilization of their lectures and tutorials;		
3.4	think critically and involve themselves in discussions with the instructor in classroom;		
3.5	present related topics orally in class, and this work may be independently and as part of a team to encourage peer discussion and offer one to one discussion;		
4.0	**Communication, Information Technology, Numerical**		
4.1	use computers and other updated materials in their mode of teachings, e.g., using CD, information items and accessories in their presentations (audio visuals). Students will be aware of these and likewise will learn and be updated on the use of these modern facilities, e.g. internet access wherein all the needed additional information in relation to their course and studies are available. .	(a) use computer technology to get access to the course material. (b) Using simple terms while conducting lessons. (c) Using technical words while teaching so that students can get acquainted with scientific terms. (d) Equipped lecture rooms and laboratories with educative tools (illustrative pictures, photos , etc.)	a) Written presentation (essay, report, reflective paper etc.) (b) Oral presentation (c) Group work (d) Discussion/debate/role play (e) Observation of real or simulated professional practice (f) Problem scenario (g) Work-based problem (h) Analyze a case (i) Seminar evaluation (j) Examinations should be answered in English language (k) Marks given to for good reports and presentations

4.2	develop the scientific language skills. .	(e) (a) Teaching and learning in English to improve student communication skills. (b) Training on numerical skills and data presentation. (c) Student involvement in seminars. (d) Internet search and assignments	
4.3	, e.g. internet access wherein all the needed. develop the scientific language skills. use online library and internet in searching for literature paper related to the subject..		
4.5	communicate with other students as well as other faculty members and deal with texts and images in the fashion of using PowerPoint.		
5.0	**Psychomotor**		
5.1	perform general and focused examination of bacteria	(a) Laboratory classes (b) Emulation of the study skills for scientists and quantitative methods (c) Reporting of laboratory exercises (d) Engage students in analysis and evaluation of their practical work (e) Training on methods of data manipulation and presentation.	(a) Demonstration (b) Role Play (c) Make a video (write script and produce/make a video) (d) Lab report (e) Prepare an illustrated manual on using the equipment, for a particular audience (f) Observation of real or simulated professional practice
5.2	demonstrate proper use of bacterial instruments (e.g., microscope, automatic staining ,soil samples, food samples and water samples		
5.3	Manipulate bacterial samples from different sources.		

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	Quizzes , Laboratory Activities	2	5%
2	Assignments/homework	5	5%
3	1st Midterm Test	6	20%
4	2st Midterm Test	12	20%
	Group project / oral presentation	13	5%
5	Attendance	14	5%
6	Final Examination	15	40%
7	Total		100%

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Quizzes ,Laboratory Activities	2	5%
2	Assignments/homework	5	5%
3	1st Midterm Test	6	20%
4	2st Midterm Test	12	20%
5	Group project / oral presentation	13	5%
6	Attendance	14	5%
7	Final Examination	15	40%
8	Total		100%

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)

All the Teaching Staff are available to assist and support the students if they have any questions or inquiries. From the start, they were given the schedule of their lectures, tutorials, clinical session for the whole semester. The students were divided into small groups and are allocated to each Teaching staff. They can have clinical sessions with their Consultants 2 – 3 times week. In addition to attending daily rounds, clinics, and theatres with the teaching staff.

(a) Office hours (4 hours / week / staff)
(b) Regular meeting with course organizer and the team leader.

E Learning Resources

1. List Required Textbooks:

- Environmental Microbiology, Patrick K. Jjemba, Science Publishers, 2004.
- Ian L. Pepper, Charles P. Gerba, Terry J. Gentry, Raina M. Maier. Environmental

Microbiology , 2011

- Pradipta K. MohapatraI. K .Textbook of Environmental Microbiology, 2008

Journals of Environmental Microbiology :

- Journal of Applied and Environmental Microbiology
- Journal of Applied and Environmental Microbiology
- International Journal of Applied Microbiology
- Asian Journal of Microbiology, Biotechnology and Environmental Sciences
- Asian Journal of Microbiology
- American Society for Microbiology

• http://onlinelibrary.wiley.com/ Environmental Microbiology journal • http://www.scopemed.org/index.phpNational Center for Biotechnology Information.
4. 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.) Accommodation (Teaching Classrooms, laboratories, demonstration rooms/labs, etc.) 1- Classrooms ready and equipped with educational media 2- Lecture room are air conditioned with at least 35 seats 3- Labs equipped with material for teaching 3- Data show: is available in the lecture hall 4- Smart Board: is available in the lecture hall 5- Laptop and Computers. 6- Central Printer, and Scanner. 7- Up to date scientific books, in the library.
2. Technology resources (AV, data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. 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 The instructor will employ the following teaching methodologies: ❖ Regular evaluation of the theoretical and practical parts of the course to identify the weaknesses areas ❖ Performance appraisal form filled up by each student to show level of fulfillment ❖ Confidential completion of standard course evaluation questionnaire ❖ Interactive Lecture/Discussion Laboratory Activities/Experimentation
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Use of views of colleagues with experience Continuous assessment of standards achieved by students.
3. Processes for Improvement of Teaching Workshop for faculty members on different teaching strategies

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

Faculty or Teaching Staff: Prof. Dr. INTISAR ELHAG ELRAYAH
Signature: _____ Date Report Completed: ___9/1/1440 _____

Program Coordinator: _____

Signature: _____ DateReceived:_____