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# National Commission for Academic Accreditation & Assessment

## COURSE REPORT

### Water and Wastewater Microbiology 401247-3

To be completed by course instructors at the end of each course and given to program coordinator.

If the course is taught in more than one location the course report should be prepared for each location by the course instructors responsible for the course in each location. A combined report should be prepared by the course coordinator and the separate location reports attached.

## Course Report

For guidance on the completion of this template, refer to Section 2.5 of Chapter 2 in Part 2 in this Handbook

Institution <b>Umm Al-Qura University</b>
College/ Department: <b>Faculty of Applied Science / Department of Biology</b>

### A Course Identification and General Information

1. Course title and code. <b>Water and Wastewater Microbiology (401247-3)</b>
2. If course is taught in more than one section indicate the section to which this report applies <b>N/A</b>
3. Year and semester to which this report applies. <b>First Semester 1436/1437 H (361) / Fall 2016</b>
4 Location (if not on main campus): <b>Main Campus (Makkah)</b>

### B- Course Delivery

1 Coverage of Planned Program			
Topics	Planned Contact Hours	Actual Contact Hours	Reason for Variations if there is a difference of more than 25% of the hours planned
❖ <b>General Introduction:</b> - An historical Aspects of air, water and sewage microbiology -water resources	2	2	
❖ <b>Drinking Water Quality Standards</b> Water Quality Standards Treatment Objectives; WHO Guidelines for Drinking Water Quality; Estimation of Water Demand.	2	2	

<p>❖ <b>Normal flora in aquatic environments</b></p> <ul style="list-style-type: none"> <li>- Cyanobacteria</li> <li>- Green algae</li> <li>- Diatoms</li> <li>- Red algae</li> <li>- Other types of algae</li> <li>- Bacteria</li> <li>- Viruses</li> <li>- Zooplankton (microscopic invertebrates)</li> </ul> <p>Aquatic Macrophytes (Floating weeds, Submergent weeds, Emergent weeds)</p>	2	2	
<p>❖ <b>Water quality and pollution of natural water sources:</b></p> <ul style="list-style-type: none"> <li>- Types and effects on natural flora:</li> <li>- Quality of surface waters</li> <li>- Water quality in flowing waters</li> <li>- Groundwater quality</li> <li>- Microbiological quality of drinking water</li> <li>- Chemical quality of drinking water</li> </ul>	2	2	
<p>❖ <b>Public health issues and water-borne diseases</b></p> <ul style="list-style-type: none"> <li>- Microbiological drinking-water quality and human health</li> <li>-Water-related disease incidence worldwide.</li> <li>- Morbidity and mortality rates of some important water-related diseases such: Amebiasis, <u>Cholera</u>, Campylobacteriosis, <u>Giardiasis</u>, <u>Hepatitis</u>, Shigellosis, Typhoid fever, Viral gastroenteritis, Cyanobacterial Toxins.)</li> <li>-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>.)</li> <li>- Opportunistic and other water-associated pathogens (Examples of</li> </ul>	4	4	

<p>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).</p>			
<p><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.</p>	2	2	
<p>❖ <b>Detailed study of Bacterial Faecal Indicators:</b> -Why Coliforms are Chosen as Indicators ((<i>Escherichia coli</i>, Faecal streptococci, Sulfite reducing clostridia). -Features and condition of organisms selected as indicators.</p>	2	2	
<p>❖ <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</p>	4	4	

<ul style="list-style-type: none"> <li>- Disinfection</li> <li>- Ion exchange softening and nitrate removal</li> <li>- Removal of dissolved salts</li> <li>- Sources of wastes in water treatment</li> <li>- Dewatering and disposal of wastes from water treatment plants</li> </ul>			
<p>❖ <b>Public health issues related to distribution networks and biofilms</b></p> <ul style="list-style-type: none"> <li>- Biofilms in Drinking Water Distribution</li> <li>- Microorganisms forming biofilms (Microbes in or associated with biofilms that may present a public health risk in the distribution system).</li> <li>- Factors related to biofilms formation</li> <li>-Corrosion control and Pipe Materials</li> <li>-Risks and hazardous resulting in biofilms</li> <li>-Health Risks from microbial Growth</li> <li>-Methods used for controlling and removing biofilms and possible indicators of the presence of a biofilm problem.</li> </ul>	<b>2</b>	<b>2</b>	
<p>❖ <b>Criteria for drinking and recreational water quality</b></p> <ul style="list-style-type: none"> <li>-Standard criteria for drinking water according WHO</li> <li>-Microbiological criteria</li> <li>-Chemical criteria (anions and cations, pH, oder)</li> <li>-Physical criteria (such color, turbidity .....</li> </ul>	<b>2</b>	<b>2</b>	
<p><b>Introduction to wastewater microbiology</b> <b>Microbiological treatment for wastewater and sewage</b></p> <ul style="list-style-type: none"> <li>-Domestic wastewater</li> </ul>	<b>4</b>	<b>4</b>	

<ul style="list-style-type: none"> <li>-Industrial wastewater and inflow</li> <li>-Infiltration and inflow</li> <li>Considerations in plant design -</li> <li>Preliminary treatment</li> <li>-Pumping stations</li> <li>-Clarification</li> <li>-Biological filtration</li> <li>-Rotating biological contactors</li> <li>Biological aeration</li> <li>-Stabilization ponds</li> <li>-Effluent disinfection</li> <li>-Individual household disposal systems</li> <li>-Characteristics and quantities of waste sludges</li> <li>-Selection and arrangement of sludge processes</li> <li>-Gravity sludge thickening</li> <li>-Thickening of waste activated sludges</li> <li>-Anaerobic and Aerobic digestion</li> <li>Agricultural land application</li> </ul>			

## 2. Consequences of Non Coverage of Topics

For any topics where significantly less time was spent than was intended in the course specification, or where the topic was not taught at all, comment on how significant you believe the lack of coverage is for the program objectives or for later courses in the program, and suggest possible compensating action if you believe it is needed.

Topics (if any) not Fully Covered	Significance of Lack of Coverage	Possible Compensating Action Elsewhere in the Program
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

3. Effectiveness of Planned Teaching Strategies for Intended Learning Outcomes set out in the Course Specification. (Refer to planned teaching strategies in Course Specification and description of Domains of Learning Outcomes in the National Qualifications Framework)

Domains	List Teaching Strategies set out in Course Specification	Were these Effective?		Difficulties Experienced (if any) in Using the Strategy and Suggested Action to Deal with Those Difficulties .
		No	Yes	
a. Knowledge	<b>-Combination of lectures by the lecturer, seminar presentation by the students and web-interactions. -Using images and related video clips</b>		✓	
b. Cognitive Skills	<b>-Lectures -Brain Storming -Discussions</b>		✓	
c. Interpersonal Skills and Responsibility	<b>-Laboratory practical session -Group discussion</b>		✓	
d. Numerical and Communication Skills	<b>-Home work / Essays -Seminar presentation</b>		✓	
e Psychomotor Skills (if applicable)	<b>Follow up students the students in lab and during carryout all the laboratory experiments</b>		✓	

4. Summarize any actions you recommend for improving teaching strategies as a result of evaluations in table 3 above.

### C. Results

1 Number of students starting the course: **39 Students**

2 Number of students completing the course: **38 Students**

3 Distribution of Grades (If percentage marks are given indicate numbers in each 5 percentile group)

	No		%	No	%	No
A	<b>1</b>	OR	95-100	<b>0</b>	70-74	<b>5</b>
B	<b>1</b>		90-94	<b>1</b>	65-69	<b>6</b>
C	<b>6</b>		85-89	<b>0</b>	60-64	<b>16</b>
D	<b>21</b>		80-84	<b>1</b>	< 60	<b>8</b>
F	<b>8</b>		75-79	<b>1</b>		
Denied Entry	<b>0</b>		Denied Entry			<b>0</b>
In Progress	<b>0</b>		In Progress			<b>0</b>
Incomplete	<b>0</b>		Incomplete			<b>0</b>
Pass	<b>29</b>		Pass			<b>29</b>
Fail	<b>8</b>		Fail			<b>8</b>
Withdrawn	<b>1</b>		Withdrawn			<b>1</b>

4 Result Summary:

Passed: No **29** Percent **77%** Failed No **8** Percent **23%**

Did not complete No **0** Percent **0%** Denied Entry No **0** Percent **0%**

5 Special factors (if any) affecting the results

**None**

6. Variations from planned student assessment processes (if any) ( See items C 4 and 5 in the Course



Specification.)	
a. Variations (if any) from planned assessment schedule (C5 in Course Specification)	
Variation	Reason
N/A	N/A
N/A	N/A
N/A	N/A
b. Variations (if any) from planned assessment processes in Domains of Learning (C4 in Course Specification)	
Variation	Reason
N/A	N/A
N/A	N/A
N/A	N/A

7 Verification of Standards of Achievement (Eg. check marking of a sample of papers by others in the department. See G4 in Course Specification) (Where independent report is provided a copy should be attached.)

Method(s) of Verification	Conclusion

### D Resources and Facilities

1. Difficulties in access to resources or facilities (if any)  None	2. Consequences of any difficulties experienced for student learning in the course.  None
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### E. Administrative Issues

<p>1 Organizational or administrative difficulties encountered (if any)</p> <p><b>None</b></p>	<p>2. Consequences of any difficulties experienced for student learning in the course.</p> <p><b>None</b></p>
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## F Course Evaluation

<p>1 Student evaluation of the course: (Attach Survey Results if available)</p>
<p>a List the most important criticisms and strengths</p> <p><b>N/A</b></p>
<p>b Response of instructor or course team to this evaluation</p> <p><b>N/A</b></p>
<p>2. Other Evaluation -- What evaluations were received? Specify and attach reports where available. (eg. By head of department, peer observations, accreditation review, other stakeholders etc):</p> <p><b>N/A</b></p>
<p>a List the most important criticisms and strengths</p> <p><b>N/A</b></p>
<p>b Response of instructor or course team to this evaluation</p> <p><b>N/A</b></p>

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## G Planning for Improvement

1. Progress on actions proposed for improving the course in previous course reports:		
Actions proposed in the most recent previous course report(s)	State whether each action was undertaken, the impact, and if the proposed action was not undertaken or completed, give reasons.	
2. Other action taken to improve the course this semester/year Provide a brief summary of any other action taken to improve the course and the results achieved. (For example, professional development for faculty, modifications to the course, new equipment, new teaching techniques etc.)		
3. Action Plan for Next Semester/Year		
Actions Required	Completion Date	Person Responsible
4. Recommendations to Program Coordinator (if Required)		
(Recommendations by the instructor to the program coordinator if any proposed action to improve the course would require approval at program, department or institutional level or that might affect other courses in the program.)		

Name of Course Instructor: **Dr Hussein H. Abulreesh**

Signature: **H. H. Abulreesh** Date Report Completed: **25/04/1438 H / 23/01/2017**

Received by Program Coordinator: **Dr H. H. Abulreesh** Date: **25/04/1438 H / 23/01/2017**