1. **Basic Information**

**Course Title:**Bacteriology of Water and Wastewater **Code**: CVE 614

**Lecture:** 3 Hour **Tutorial**: ---- **Practical**: ---- **Total:** 3 Hour

**Program on which the course is given:** M.Sc. / Sanitary and Environmental Engineering

**Compulsory or Elective element of program:**Compulsory

**Department offering the program:** Civil Engineering

**Department offering the course:** Civil Engineering

**Academic year / level:** 2015-2016/M.Sc.

**Date of specifications approval:** 2012

**B- Professional Information**

1. **Overall aims of course**

1. Apply knowledge to the solution of watermicrobiology challenges.
2. Develop professional skills in the field of watermicrobiology.
3. Recap the principles of watermicrobiology.
4. Acquire the skills of wastewater analysis and associated watermicrobiology issues.
5. Develop awareness of techniques and analysis methods in watermicrobiology issues.
6. **Intended Learning outcomes of Course (ILOs)**

By the end of the course the students will be able to:

1. **Knowledge and Understanding:**

a.1layout the essential features of water microbiology. (A.3)

a.2 Recap the ethical principles of professional practices in the water microbiology. (A.4)

1. **Intellectual Skills**

b.1 Conduct information analysis and appraisal in water microbiology. (B.1)

b.2Acquire the skill of solving problems in the absence of the some data. (B.2)

b.3Connect various sources of knowledge to them in solving problems. (B.3)

b.4Acquire the skill of decision making in different professional situations. (B.7)

1. **Professional and Practical Skills**

c.1Acknowledge basic professional skills in relation to water microbiology. (C.1)

c.2 Evaluate the techniques used in water microbiology. (C.3)

1. **General and Transferable Skills**

d.1Gain time management skills. (D.7)

d.2Learn effectively to continue development , professionally. (D.8)

1. **Contents**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Topic** | **Credit hours** | **ILOs** | **Teaching / learning methods and strategies** | **Assessment method** |
| 1 | The Groups of micro-organisms | 3 | b1, b.2, b.3, b.4, c.1, c.2 | Lectures |  |
| 2 | The Groups of micro-organisms | 3 | b1, b.2, b.3, b.4, c.1, c.2 | Lectures |  |
| 3 | Factors affecting growth of bacteria. | 3 | a.1, a.2, b1, b.2, b.3, b.4 | Lectures | Assignments. |
| 4 | Factors affecting growth of bacteria. | 3 | a.1, a.2, b1, b.2, b.3, b.4 | Lectures |  |
| 5 | Factors affecting growth of bacteria. | 3 | a.1, a.2, b1, b.2, b.3, b.4 | Lectures |  |
| 6 | Electronic indicators for microbial contamination. | 3 | a.1, a.2, b.3, b.4, c.1, c.2 | Lectures |  |
| 7 | Electronic indicators for microbial contamination. | 3 | a.1, a.2, b.3, b.4, c.1, c.2 | Lectures | Assignments. |
| 8 | Mid-Term Exam | | | | |
| 9 | Sources of water. | 3 | a.1, a.2, b1, b.2, b.3, c.2 | Lectures |  |
| 10 | Sources of water. | 3 | a.1, a.2, b1, b.2, b.3, c.2 | Lectures | Assignments. |
| 11 | Potable water as a source of transmission of microbial diseases | 3 | a.1, b1, b.2, b.3, b.4, c.1 | Lectures |  |
| 12 | Potable water as a source of transmission of microbial diseases | 3 | a.1, b1, b.2, b.3, b.4, c.1, d.1, d.2 | Lectures, case study | Assignments. |
| 13 | Use of simple, economic and fast methods for detection of viruses in Potable water. | 3 | b1, b.2, b.3, b.4, c.1, c.2, d.1, d.2 | Lectures, case study |  |
| 14 | Use of simple, economic and fast methods for detection of viruses in Potable water. | 3 | b1, b.2, b.3, b.4, c.1, c.2, d.1, d.2 | Lectures, case study | Report |
| 15 | Final Exam | | | | |

1. **Teaching and Learning Methods**

\_\_\_√\_\_ Lectures

\_\_\_\_\_ Practical training / laboratory

\_\_\_\_\_ Seminar / workshop

\_\_\_\_\_ Class activity

\_\_\_√\_\_Case study

\_\_\_√\_\_Assignments / homework

1. **Student Assessment Methods**

\_\_\_\_√\_\_\_\_\_ Assignments to assess knowledge and intellectual skills

\_\_\_\_\_\_\_\_\_ Quiz to assess

\_\_\_\_√\_\_\_\_\_ Mid-year exam to assess knowledge and intellectual skills

\_\_\_\_√\_\_\_ Report to assess knowledge and intellectual skills

\_\_\_\_√\_\_\_\_\_ Final exam to assess knowledge and intellectual skills

1. **Assessment schedule**

Assessment 1 4 Assignments on weeks 3, 7, 10, 12

Assessment 2 Mid-term exam on week 8

Assessment 3 Report on week 14

Assessment 4 Final exam on week 15

1. **Weighting of Assessments**

Mid- Term Examination 15%

Final- Term Examination 67%

Report 10%

Practical Examination 00%

Semester Work 08%

Other 00%

Total 100%

1. **List of References**

**a.Course Notes**

* Course notes prepared by instructor.

**b. Essential Books (Text Books)**

* The Egyptian Code of Water and Wastewater Treatment Plants.

1. **Recommended Books**

* Duncan Mara and Nigel Horan, Handbook of Water and Wastewater Microbiology, ISBN: 978-0-12-470100-7, 2010.
* Metcalf & Eddy, Wastewater Engineering Treatment and Reuse, 3rd edition (ISBN 0-07-100824-1), 2011.

1. **Periodicals Web sites, etc**

* www.Science Direct.com
* American society of civil engineering journal

1. **Facilities Required for Teaching and learning**

* Lecture room equipped with computer and data show

1. **Matrix of course aims and ILO’s**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course aims** | a3 | a4 | b1 | b2 | b3 | b4 | B7 | C1 | c2 | C3 | D7 | D8 |
| 1. Apply knowledge to the solution of watermicrobiology challenges. | √ | √ | √ |  | √ |  | √ |  |  | √ |  | √ |
| 1. Develop professional skills in the field of watermicrobiology. |  | √ |  | √ |  |  |  | √ |  |  | √ |  |
| 1. Recap the principles of watermicrobiology. |  |  | √ |  |  |  |  |  |  |  |  |  |
| 1. Acquire the skills of wastewater analysis and associated watermicrobiology issues. |  |  |  |  | √ |  |  |  |  |  |  |  |
| 1. Develop awareness of techniques and analysis methods in watermicrobiology issues. | √ |  |  |  |  |  | √ | √ |  |  | √ |  |

**Course coordinator:** Associate Prof. Dr. Badr El Din Hegazy

**Course instructor:** Prof. Dr. Mohamed kamel

**Head of department:** Prof. Dr.Ahmed abd El Fatah

**Date: 1/9/2015**