1. **Basic Information**

**Course Title:**Sanitary Chemistry **Code**: CVE 613

**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. Develop the student awareness of the water and wastewater chemical characteristics and associated sanitary chemistry issues.
2. Familiarize the student with different chemical experiments and analysis for water and wastewater.
3. Recap the complicated chemical reactions used to treat water and wastewater.
4. **Intended Learning outcomes of Course (ILOs)**

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

1. **Knowledge and Understanding:**

a.1 layout the essential features of sanitary chemistry. (A.3)

a.2 Recap the ethical principles of professional practices in sanitary chemistry.(A.4)

1. **Intellectual Skills**

b.1 Conduct information analysis and appraisal in sanitary chemistry. (B.1)

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

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

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

1. **Professional and Practical Skills**

c.1 Acknowledge basic professional skills in relation to sanitary chemistry. (C.1)

c.2 Evaluate the techniques used in sanitary chemistry. (C.3)

1. **General and Transferable Skills**

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

1. **Contents**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Topic** | **Credit hours** | **ILOs** | **Teaching / learning methods and strategies** | **Assessment method** |
| 1 | General Properties of water | 3 | a.1, a.2, b.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 2 | General Properties of water | 3 | a.1, a.2, b.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 3 | General Properties of water | 3 | a.1, a.2, b.1, b.2, b.3, c.1, c.2, | Lectures | Assignments. |
| 4 | Chemical Properties of water | 3 | a.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 5 | Chemical Properties of water | 3 | a.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 6 | Chemical Properties of water | 3 | a.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 7 | Chemical Properties of water | 3 | a.1, b.2, b.3, c.1, c.2, | Lectures | Assignments. |
| 8 | Mid-Term Exam | | | | |
| 9 | Standards of drinking water | 3 | a.1, a.2, b.1, b.2, b.3, c.1, c.2, | Lectures |  |
| 10 | Standards of drinking water | 3 | a.1, a.2, b.1, b.2, b.3, c.1, c.2, | Lectures | Assignments. |
| 11 | Standard of Wastewater | 3 | a.1, a.2, b.3, c.1, c.2, | Lectures |  |
| 12 | Standard of Wastewater | 3 | a.1, a.2, b.3, c.1, c.2, | Lectures, case study | Assignments. |
| 13 | Sewer appurtenances | 3 | a.2, b.1, b.2, b.3, b.4, c.1, d.1 | Lectures, case study |  |
| 14 | Chemical Treatment of water and Wastewater | 3 | a.1, a.2, b.1, b.2, b.3, b.4 | 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 knowledge and intellectual skills

\_\_\_\_√\_\_\_\_Mid-term 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**
2. **Course Notes**

* Course notes prepared by instructor.

1. **Essential Books (Text Books)**

* The Egyptian Code of Water and Wastewater Treatment Plants.

1. **Recommended Books**

* Farag, M.A., Sanitary Engineering Encyclopedia, ISBN 977- 5758537-8, 1995.
* Metcalf & Eddy, Wastewater Engineering Treatment and Reuse, 3rd edition (ISBN 0-07-100824-1), 2010.
* Terence J. McGhee, Water Supply and Sewerage, (ISBN 0-07-100873-3), 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**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course aims** | a1 | a2 | a3 | a4 | b1 | b2 | b3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | D7 |
| 1. Develop the student awareness of the water and wastewater chemical characteristics and associated sanitary chemistry issues. |  |  |  | √ | √ |  |  |  |  |  |  |  |  | √ |  |
| 1. Familiarize the student with different chemical experiments and analysis for water and wastewater. |  |  | √ |  |  | √ |  |  |  |  |  | √ |  |  | √ |
| 1. Recap the complicated chemical reactions used to treat water and wastewater. |  |  |  | √ | √ |  | √ |  |  |  | √ |  |  |  |  |

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

**Course instructor:** Dr. Ahmed Abdeen

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

**Date: 1 / 9 / 2015**