1. **Basic Information**

**Course Title**: Engineering Hydrology **Code**: CVE 509

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

**Program on which the course is given:** Diploma of Water Resources and Hydraulics Engineering

**Major or minor element of program:** Major

**Department offering the program:** Civil Engineering

**Department offering the course:** Civil Engineering

**Academic year / level:** Diploma / 2015-2016

**Date of specifications approval:** 2012

**B- Professional Information**

1. **Overall aims of course**
2. Describe the hydrologic cycle in detail with an understanding of the relative importance and magnitude of each cycle component.
3. Analyze in quantitative terms the processes of precipitation and evaporation transpiration, infiltration, interception, and depression storage.
4. Calculate effective rainfall for given hyetographs and watershed conditions.
5. **Intended Learning outcomes of Course (ILOs)**

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

1. **Knowledge and Understanding:**

a.1 Describe the legality and ethics of professional design of engineering hydrology.(A.2)

a.2 Mention the basics and guidelines of quality in the professional design of engineering hydrology. (A.3)

1. **Intellectual Skills**

b.1 Formulate the prioritization, recognition, and analysis of problems in engineering hydrology.(B.1)

b.2 Interpret to solve surveying problems in his/her field.(B.2)

b.3 Choose the hazards resulted from the surveying practices. (B.4)

1. **Professional and Practical Skills**

c.1 Conduct academic writing skills and prepare technical reports. (C.2)

**d.** **General and Transferable Skills**

d.1 Counsel presentation skills. (D.1)

d.2 Contribute to the development of the professional practice through applications of information technology. (D.2)

d.3 Counsel assessment and identification of student’s learning needs. (D.3)

d.4 Communicate leadership skills. (D.6)

1. **Contents**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Topic** | **Credit hours** | **ILOs** | **Teaching / learning methods and strategies** | **Assessment method** |
| 1 | Weather and hydrology | 3 | a.1, a.2, b.3 | Lectures |  |
| 2 | Weather and hydrology | 3 | a.1, a.2, b.3, c.1, d.1, d.2, d.4 | Lectures |  |
| 3 | Precipitation, stream flow analysis | 3 | a.2, b.1, b.2, b.3, d.4 | Lectures | Assignments. |
| 4 | Precipitation, stream flow analysis | 3 | a.2, b.1, b.2, b.3, d.1,d.3, d.4 | Lectures |  |
| 5 | Evaporation and transportation | 3 | a.1, a.2, b.1, b.2, c.1 | Lectures |  |
| 6 | Evaporation and transportation | 3 | a.1, a.2, b.1, b.2, c.1, d.2, d.3 | Lectures |  |
| 7 | Subsurface water, stream flow hydrographs, precipitation-runoff relations | 3 | a.2, b.1, b.2, b.3 | Lectures | Assignments. |
| 8 | Mid-term Exam | 3 | a.1, a.2, b.1, b.2, b.3 |  | Mid-term Exam |
| 9 | Subsurface water, stream flow hydrographs, precipitation-runoff relations | 3 | a.2, b.1, b.2, b.3, d.1, d.2,d.4 | Lectures |  |
| 10 | Stream flow routing, probability studies | 3 | a.1, a.2, b.1, b.2 | Lectures | Assignments. |
| 11 | Stream flow routing, probability studies | 3 | a.1, a.2, b.1, b.2, d.1, d.2, d.3 | Lectures |  |
| 12 | Stochastic hydrology | 3 | a.1, a.2, c.1 | Lectures, case study | Assignments. |
| 13 | Stochastic hydrology | 3 | a.1, a.2, c.1, d.1, d.3, d.4 | Lectures, case study |  |
| 14 | Sedimentation | 3 | a.2, b.1, c.1, d.1, d.2, d.4 | Lectures, case study | Assignments. |
| 15 | Final Exam | 3 | a.1, a.2, b.1, b.2, b.3 |  | Final Exam |

1. **Teaching and Learning Methods**

\_\_\_√\_\_ Lectures

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

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

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

\_\_\_√\_\_ Case study

\_\_\_√\_\_ Assignments / homework

1. **Student Assessment Methods**

\_\_\_√\_\_\_\_\_ 5 Assignments to assess knowledge and intellectual skills

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

\_\_\_\_√\_\_\_\_Mid-term exam to assess knowledge and intellectual skills

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

1. **Assessment schedule**

Assessment 1 5 Assignments on weeks 3, 7, 10, 12, 14

Assessment 2 Quizzes on weeks -----------------

Assessment 3 Mid-term exam on week 8

Assessment 4 Final exam on week 15

Other:------------------

1. **Weighting of Assessments**

Mid- Term Examination 15%

Final- Term Examination 67%

Practical Examination 00%

Semester Work 18%

Other 00%

Total 100%

1. **List of References**
   1. Course Notes

* Course notes prepared by instructor.
  1. Recommended Books
* K Subramanya., “Engineering Hydrology”, McGraw-Hill Education, 2013
* Ward A. D., "Environmental Hydrology", Lewis Publisher, 1995
* Linsley R.K., Kohler M.A. & Paulhaus J.L.H., "Hydrology for Engineers", 2012
  1. Periodicals Web sites, etc
* Science Direct
* 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**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **program aims** | **a.1** | **a.2** | **b.1** | **b.2** | **b.3** | **c.1** | **d.1** | **d.2** | **d.3** | **d.4** |
| 1. Describe the hydrologic cycle in detail with an understanding of the relative importance and magnitude of each cycle component. | √ |  |  | √ |  |  |  |  | √ | √ |
| 1. Analyze in quantitative terms the processes of precipitation and evaporation transpiration, infiltration, interception, and depression storage. |  |  |  | √ | √ | √ |  |  | √ |  |
| 1. Calculate effective rainfall for given hyetographs and watershed conditions. |  | √ | √ |  | √ |  | √ | √ |  |  |

**Course coordinator:** Prof. Dr. Gamal H. El Saeed

**Course instructor:** Dr. Alaa El-Hazek

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

**Date:** 1 / 9 / 2015