Course Specifications of
Irrigation & Drainage Engineering - C 352

University: Benha  Faculty: Benha Faculty of Engineering

Course specifications
Programme(s) on which the course is given: Structural Engineering & Utilities
Engineering

Major or minor element of programmes: N.A.
Department offering the programme: Civil Engineering
Department offering the course: Civil Engineering
Academic year / Level: 3rd year – 2nd term
Date of specification approval: / /2009

A- Basic Information
Title: Irrigation & Drainage Engineering  Code: C 352
Credit Hours: N.A.  Lecture: 3
Tutorial: 2  Practical: -  Total: 5

B- Professional Information

1 - Overall aims of course:
By the end of the course the students will be able to:
- Learn about the elements of the hydrological cycle.
- Demonstrate knowledge and understanding of water resources and water demands.
- Estimate irrigation water demands.
- Demonstrate knowledge and understanding of the structures used at the intersection between waterways or between roads and waterways.
- Demonstrate the development of irrigation system in Egypt.
- Plan, design, manage and operate various in-farm irrigation systems such as flood, sprinkler and drip irrigation.
- Plan, design, manage and operate various drainage systems such as surface drainage and subsurface drainage.
- Recognize the different types of crossing structures (bridges, culverts, siphons and aqueducts.
- Propose different solutions for the crossing, compare between them, and then decide which one is the best.
- Draw and illustrate the different views of the structures.

2- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:
   a.1 Water cycle, water resources and water demands.
   a.2 Soil-plant-water relationships.
   a.3 An overview for the irrigation structures.
   a.4 Development of irrigation system in Egypt.
   a.5 Design of surface drainage and subsurface drainage.
   a.6 Hydraulic design of hydraulic crossing structures.
   a.7 Drawing different views of the structures.

b- Intellectual skills
   b.1 Design of irrigation and drainage systems.
   b.2 Suggest alternative solutions for the crossing between two waterways or between a road and a waterway.
   b.3 Analyze and compare the different alternatives.
   b.4 Choose the optimum solution.

c- Professional and practical skills
   c.1 The ability to determine the irrigation efficiency in any type of the irrigation systems.
   c.2 The ability to calculate periods between irrigation and irrigation time.
   c.3 Planning, design, management and operation for different irrigation systems.
   c.4 Planning and design of small irrigation structures.

d- General and transferable skills
   d.1 Ability to practice team work and present results.
   d.2 Management for water resources and water demand.
   d.3 Ability to practice in a team to align and plan different irrigation structures in a large cultivated area.
3- Contents

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<thead>
<tr>
<th>Topic</th>
<th>No. of Hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
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<tr>
<td>Introduction - Hydraulic cycle</td>
<td>5</td>
<td>3</td>
<td>2</td>
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<td>Water resources in Egypt</td>
<td>5</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Irrigation system development in Egypt</td>
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<td>3</td>
<td>2</td>
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<tr>
<td>Soil - Plant relationships and water demands</td>
<td>5</td>
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<td>2</td>
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<tr>
<td>Surface irrigation methods</td>
<td>5</td>
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<td>2</td>
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<tr>
<td>Management of water distribution and control systems</td>
<td>5</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Sprinkler irrigation method and network design</td>
<td>5</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Drip irrigation method and network design</td>
<td>5</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Overview on irrigation structures</td>
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<tr>
<td>Culverts (hydraulic design - drawings)</td>
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<td>2</td>
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<tr>
<td>Syphons (hydraulic design- drawings)</td>
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<td>Aqueducts (hydraulic design- drawings)</td>
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<tr>
<td>Escapes (hydraulic design- drawings)</td>
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<tr>
<td>Design of surface drainage and subsurface drainage</td>
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<td><strong>75</strong></td>
<td><strong>45</strong></td>
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4- Teaching and learning methods

4.1- Class lectures.
4.2- Tutorials.
4.3- Internet search.

5- Student assessment methods

5.1 - Sheets to assess knowledge, understanding, and communications skills.
5.2 - Quizzes to assess knowledge and understanding.
5.3 - Mid-term exam to assess knowledge, understanding, and critical thinking skills.
5.4 - Final-exam to assess knowledge, understanding, and critical thinking skills.

Assessment schedule

- Assignment 1: Week 3
- Assignment 2: Week 5
- Mid-term exam (1): Week 7
Assignment 3  Week 10
Assignment 4  Week 12
Mid-term exam (2)  Week 14

Weighting of assessments

<table>
<thead>
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<th>Assessment</th>
<th>Weight (%)</th>
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<tr>
<td>Mid-term examination</td>
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<tr>
<td>Final-term examination</td>
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<td>Quizzes</td>
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<td><strong>Total</strong></td>
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6- List of references

6.1- Course notes
- Lecture notes.

6.2- Essential books (text books)
- Principle of Irrigation & Drainage Engineering.
- Irrigation & Drainage Engineering.

6.3- Recommended books

6.4- Periodicals, Web sites, … etc
- N.A.

7- Facilities required for teaching and learning
- Appropriate teaching class including laptop, data show, and display screen.

Course coordinator: Dr. Tarek Hemdan Nassralla
Head of Department: Assoc. Prof. Dr. Ashraf Abou-Rayn
Date: / / 2009