Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering		المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسه

CE 636 Water Resources Planning

College: Engineering

Department: Civil

First: Course Definition

1- Course Code: CE 636

2- Units: 3

3- Semester:

4- Prerequisite:

5- Co-requisite:

6- Location (if not on main Campus):

Second: Course Objectives

1- To describe fundamentals of the water cycle, hydrology and water use trends and categories necessary for water resources planning.
2- To discuss planning process, its implantation activities and its various theoretical bases.
3- To distinguish the various planning tools as well as their applicability and usefulness.
4- To evaluate component(s) of a specific water resource planning project.

Third: Course Specifications

1- Topics to be covered

Subject	No of Weeks	Units
Principles and standards for planning water resources	2	6
Water uses and water demand estimation methods	3	9
Water supply alternatives and water supply estimation methods	2	6
Benefit-cost analysis, economic and financial analysis	2	6
Environmental impact assessment	2	6
Legal and institutional aspects	1	3
Elements of project formulation and appraisal	1	3

Programming water resources investigations	1	3

2- Course components (Total hrs in the Semester): 42

Lecture	Exercise	Other
42	-	0

3- Intended Learning Outcomes of the Course (ILO's)

a. *Knowledge*

i) Description of the knowledge to be acquired:

- *Principles and standards for planning water resources*
- *Water uses and water supply alternatives*
- *Benefit-cost analysis, economic and financial analysis*
- *Environmental impact assessment*
- *Legal and institutional aspects*
- *Elements of project formulation and appraisal*
- *Programming water resources investigations*

ii) Teaching strategies to be used to develop that knowledge

- Class lectures.
- Term projects.
- Students' presentations.
- Group discussion.
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iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Homework assignments.
- Term projects.

b- Cognitive (Intellectual) Skills

i) Cognitive skills to be developed

- *Water uses and water supply alternatives*
- *Benefit-cost analysis, economic and financial analysis*
- *Environmental impact assessment*
- *Elements of project formulation and appraisal*

ii) Teaching strategies to be used to develop these cognitive skills

- Class lectures.
- Case studies analysis.
- Term projects.

iii) Methods of assessment of students' cognitive skills

- Students' seminars and presentations.
- Term projects.
- Written reports.

c. Interpersonal Skills and Responsibility

i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Decision making based on engineering analysis.
- Communication skills.
- Team work.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Term projects.
- Case studies analysis.

iii) Methods of assessment of students' interpersonal skills and capacity to carry responsibility

- Term project.
- Written reports.
- Students' seminars and presentations.

d. Communication, Information Technology and Numerical Skills

i) Description of the skills to be developed in this domain

- Literature research.
- Problems modeling.
- Utilization of computer applications in analysis and design.

ii) Teaching strategies to be used to develop these skills

- Class lectures.

- Case studies analysis.
- Computer lab sessions.
- Term projects.

iii) Methods of assessment of students numerical and communication skills

- Term projects.
- Written reports.
- Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills

i) Description of the psychomotor or other skills to be developed and the level of performance required

- NA
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ii) Teaching strategies to be used to develop these skills-

- NA
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iii) Methods of assessment of student's psychomotor skills

- NA
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4- Student Assessment Schedule

Serial	*Assessment tool (test, group project, examination etc.)*	*Week due*	*Weight*
1	Term Project – 1	3rd	15 %
2	Mid Term Exam -1	7th	15 %
3	Term Project – 2	10th	15 %
4	Term Project – 3	13th	15 %
5	Final Exam	16th	40 %

5- Student Support

- Providing electronic library of textbooks and scientific periodicals.
- Providing the necessary computer applications for the course.

6- Learning Resources

i) Essential Books (References)

- Dzurik, A. and D.A. Theriaque. "Water Resources Planning," Rowman & Littlefield Publishers," 3th edition, 2002.
- Wurbs R.A, and W.P. James. "Water Resources Engineering," Prentice Hall, USA, 2001. ISBN-10: **0130812935** , ISBN-13: **9780130812933**.
- Chin D.A. "Water-Resources Engineering," Prentice Hall, USA, 2007, ISBN-10: 0131481924, ISBN-13: 9780131481923.

ii) Course Notes

- NA

iii) Recommended Books

- Linsley R.K. , J.B. Franzini, D. L. Freuberg and G. Tchobanoglous, Water Resources Engineering. McGraw-Hill , Fourth edition, 1992.
- Mays, L.W. "Water Resources Engineering," John Wiley and Sons, Inc, 2005, ISBN-13: 978-0-471-70524-6

iv) Electronic Books & Web Sites:

- Scientific journals and forums.
- Instructor's instruction.

v) Periodicals

- Journal of water Resources Planning and Management
- The International Journal of Water Resources Development
- International Journal of Climatology
- Journal of the American Water Works Association
- Journal of Environmental Economics and Management
- ASCE scientific journals.

7- Course Evaluation and Improvement Processes

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Students' questioners.
- Students' evaluation of course and instructor.

ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Public faculty seminars.
- Assessment by external evaluators of students achievements.
- Instructor (Course) Report.

iii) Processes for Improvement of Teaching

- Assessment of students' work by external examiners.
- Analysis of students' evaluation of course and instructor.
- Seminars by industry professionals.

iv) Processes for verifying standards of student achievement

- Check marking by an independent faculty member of a sample of student work.
- Periodic exchange and remarking of a sample of assignments/exams with a external evaluator.

v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Assessment and evaluation of the level of achieving the course outcomes through a continuous improvement process (part of a quality assurance system established by the university),
- Consequently, actions are to be taken to improve the course delivery when necessary.
- Review of the course objectives, outcomes and curriculum every 2 years.