

Construction & Building Engineering Courses (CB)

Water Resources & Coastal Engineering Courses Group

CB 382 – Water Resources Engineering

COURSE INFORMATION

Course Title: Water Resources Engineering

Code: CB 382

Hours: Lecture – 4 Hrs. Tutorial – 2 Hrs. Credit –3.

Prerequisite: CB 281

GRADING

Class Performance/Attendance: 10%

Midterm # 1/Assignments – (7th Week): 30%

Midterm # 2/Assignments – (12th Week): 20%

Final Exam: 40%

COURSE DESCRIPTION

Watershed hydrology and hydraulic measurements; Principles of hydrologic modeling for surface water; Introduction to ground water engineering. Design of erodible and non-erodible channels open channels; Flow characterization of lakes & reservoirs and its design engineering; Design and construction aspects of water resources structures; Dams and ancillary water supply structures; Flood-damage mitigation and stormwater control structures; Planning of water resources projects and introduction to water resources management. Field visits to water resources projects and laboratory facilities.

TEXT BOOK

Water Resources Engineering 2nd edition by Larry W. Mays, Publisher: John Wiley, 2004.

REFERENCE BOOKS

Flood Risk Management by G. Fleming, ed., ICE, Thomas Telford Publisher: London, U.K., 2000

Integrated Watershed Management in the Global Ecosystem by Lal, R., ed., CRC Press Publisher: Boca Raton, USA, 2000.

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Computer Applications in Hydraulic Engineering-connecting theory to practice by Walski, M.T. (Ed), Haestad Press Publisher: Waterbury, CT, U.S.A., 2002

Water Resources Engineering by R.Linsley, J.B. Franzini D.L. Freyberg and G. Publisher: Tchobanoglous, McGraw-Hill, Inc., New York, 1992.

COURSE AIM

This course is designed to provide the students with the fundamentals of hydrology, water resources engineering and water resources management.

SPECIFIC OUTCOMES OF INSTRUCTION

- The student should know the application of hydraulics and hydrology and water quality principles to the design and construction considerations of water-resources engineering projects.
- The student should know the fundamentals of sustainable development as applied to management of water resources projects.

COURSE OUTLINE

- Week Number 1:* Fields and management challenges of water resources (quality and quantity) for the municipal, industrial and agricultural sectors.
- Week Number 2:* Watershed descriptive hydrology and measurements.
- Week Number 3:* Quantitative hydrology and principles of sustainability.
- Week Number 4:* Quantitative surface water hydrology.
- Week Number 5:* Groundwater hydrology, and principles of sustainability.
- Week Number 6:* Groundwater engineering
- Week Number 7:* Flow regimes in natural & open channel streams and sediment transport.
- Week Number 8:* Design of water supply open channels uniform flow
- Week Number 9:* Design of water supply open channels: non-uniform flow.
- Week Number 10:* Reservoirs and lakes.
- Week Number 11:* Hydraulic structures for water resources management.
- Week Number 12:* Hydraulic structures:
– Dams, spillways, gates, outlet works and river navigation structures.
- Week Number 13:* Flood-damage mitigation structures and storm-water management.

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Week Number 14: Sustainability of water resources management and global climate change.

Week Number 15: Case studies of water resources development and water quality management.

COURSE COORDINATOR AND DEMAND

Course Coordinator: Dr. Wael Mohamed Hamdy Khadr.

Course Demand: *Required*