CIVL 7015 WATER RESOURCES SYSTEMS ANALYSIS

Credit Points 10

Legacy Code 301012

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Description Water resources projects are large infrastructure projects requiring huge capital expenditure. In addition, multiple options are usually available to meet the project goals but at different costs and under varying constraints. This unit presents the application of optimisation techniques to select the best project from a list of competing projects. Applications of these techniques to optimally allocate available water resources are discussed. These are presented within the context of maximising the return of investment.

School Eng, Design & Built Env

Discipline Water and Sanitary Engineering

Student Contribution Band HECS Band 2 10cp

Level Postgraduate Coursework Level 7 subject

Restrictions

Students must be enrolled in a postgraduate Engineering program undertaking a Civil Engineering major.

Assumed Knowledge

Discounting techniques, time value of money, equivalence analysis, present worth analysis, annual worth analysis, benefit-cost analysis, net benefit analysis, rate of return. Fluid properties, hydrostatics, open channel flow analysis, pipe network analysis, analysis and design of hydraulic structures, exposure to surface water hydrology and its components, water quality analysis.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. formulate and solve optimisation problems with specific application to water resources projects
2. use linear and non-linear programming techniques in the decision making process (water resources projects)
3. propose the best water resource project alternative from among various available options
4. develop and implement decision support systems in selection of available water resources
5. select and apply the most appropriate model from among commonly available water allocation models
6. communicate effectively with peers and wider professional communities

Subject Content

1. Linear Programming principles
2. Non-linear Programming techniques
3. Engineering Economic theory
4. Water Allocation Models
5. Commonly used optimisation packages

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Project Report x 1	2500 words (plus appendices) (est.)	85	N	Individual
Oral Presentation	30-min oral presentation	15	N	Individual

Teaching Periods