

Department: Civil & Environmental Engineering

Division: Civil engineering

Level and Major: Graduate - Hydraulic structures and Water Engineering

Course Title: Concrete dams

Number of Credits: 3

Prerequisite (Corequisite): Structural analysis (I), Concrete Technology Lecturer: -

Course Topic

- Familiarity and introducing types of concrete dams
- **Criteria for selection of dam construction include:** factors of water resources, economics, geometric and geotechnical engineering
- **Arched concrete dams:** materials, load carrying mechanisms, manufacturing features, possible types of spillways
Arc shape criteria, cantilevered shape, dam shape, shape optimization method, mathematical definition of body shape
Macro-stability control of abutments, stress distribution criteria
- **Massive concrete of dams:** thermal issues, mix design, pre-and post cooling methods for materials and concrete and their calculations
Roller concrete in dams, concrete failure in concrete dams
- **Loading of concrete dams includes:** sub-main and main loading(water, soil, drift and resistant) body weight, heat (thermal loading includes: internal heat and how to control it, environmental heat and how to determine and apply it), earthquake,interaction(...
- Earthquake and it affects on dam) determining different level so earthquake loads include: rise level, base acceleration, spectrum, moment diagram, earthquake design hydrodynamic loads caused by earthquake, vulnerability of concrete dams against earthquake and how to correct their shape to reduce vulnerability)
- Dynamic behavior of arched concrete dams and weight dams
- An introduction to load test analysis method
- **Mathematical model and methods of analysing concrete dams include:** structure, foundation and lake – limited component method
- Determination of stress reliability coefficients and design of concrete – design regulations
- Analysis and design points of arched concrete dams, including 2 and 3 dimensional methods
- Points of analysis and design of weight concrete dams
- Points of analysis and design of buttress concrete dams
- Points of analysis and design of design of multi-arc and arc weight dams
- Implementation methods and behavioral equipment of concrete dams
- Provide video, slide, and visit from real dam construction

Course Description:

Reading Sources:

Course Goals and objectives:

Evaluation:

Course topics:

The course aims to:

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