

Course Name	Code\No.	Number of Credits			
		Theo.	Lab.	Train.	Credit
Water Resources Planning and Management	HWR 461	2	-	-	2
Pre-Requests	HWR 313, HWR 351				

**Course Objectives:**

This course aims to identify the foundations and objectives of water resources planning and management, economic analysis of water projects, planning of multi-purpose water projects, components and methods of water projects, mathematical models and analytical systems, risk analysis of water projects, computer applications, methods and techniques for assessing environmental impacts and its applications for water projects and public projects.

**Course Contents:**

- 1- Planning and management issues: goals and institutional constraints, identifying and evaluating design and management alternatives, the role of modeling, its advantages, and limitations.
- 2- Economic Analysis: Examples showing how to use engineering and microeconomic analysis in planning and managing water resource infrastructure.
- 3- Optimization Modeling: Examples illustrating the different types of models, methods of solutions and applications for planning and managing water resource infrastructure.
- 4- Multipurpose river basin planning methods. Infiltration.

**Course outcomes:**

It is expected that the student will gain the following knowledge and skills:

1. Determining the available water resources and how they will change over time
2. Create simple optimization models using linear programming
3. Simulate water quality changes and link them to regulations
4. Risk assessment in flood and drought planning
5. Plan future demand scenarios based on climate change
6. Evaluating system management options to improve water availability

**Evaluation Method:**

Student can be evaluated upon monthly exams, final exam and class homework, class discussions as well as lab experiments and lab reports.

**References:**

- **Loucks, D. and Beek, E.** (2017), Water Resources Systems Planning and Management: An introduction to methods, models and applications, springer.
- **Kolokytha, E., Oishi, S. and Teegavarapu, R.** (2017). Sustainable Water Resources Planning and Management, springler.
- **Garcia, L., Rodriguez D., Wijnen M. and Pakulski I.** (2016) Earth Observation for Water Resources Management, World Bank Publication.
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