UNIVERSITY OF NICOSIA
ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

Course Code	**Course Title**	**ECTS Credits**
CEE-441	Hydraulics	7
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	CEE-341
Type of Course	**Field**	**Language of Instruction**
Required	Civil and Environmental Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	4th	Dr Paris Pittakaras
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:

- Introduce students to the main principles and fundamental laws of hydrology and groundwater flow
- Explain the theory of water flow and the importance of pressure forces and surface friction
- Provide students the knowledge and the ability to take measurements in order to quantify the performance of a hydraulic system
- Explain methods of monitoring groundwater and surface water flow through the use of measurements and estimation
- Introduce students to methods of analysis for the characterization and performance evaluation of hydraulic systems and groundwater flow
- Provide the tools and knowledge for proper engineering design of pipeline systems and hydraulic structures
- Provide students hands-on experience through laboratory experiments

Learning Outcomes:

After completion of the course students are expected to:

- Define fundamental principles and concepts of engineering hydraulic systems
- Explain water flow in hydraulic structures
- Identify the importance and the role of water pressure and pressure forces in hydraulic systems including the effects of surface friction
- Develop methods of analysis of groundwater flow in pipelines and pumped distribution networks for urban areas
- Develop methods of analysis of water flow in open channels including man-made channels and rivers
- Use techniques and graphs for the analysis of system performance and characteristics
- Perform measurements and analyze data in order to characterize the

performance of a hydraulic system
- Utilize engineering tools and techniques to properly design a hydraulic system or structure

Course Contents:

- Introduction to hydrology
- Fundamental properties of water
- Water pressure and pressure forces
- Theory, application, and development of groundwater flow
- Contaminant transport and groundwater modeling
- Water flow in pipes
- Pipelines and pipe networks
- Water pumps
- Water flow in open channels
- Groundwater hydraulics
- Hydraulic structures
- Water pressure, velocity, and discharge measurements
- Hydraulic design
- Conveyance systems: open channel flow
- Urban drainage systems

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises, discussion, projects, lab sessions

Assessment Methods:

Homework, exams, final exam, lab reports, project reports

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
R. J. Houghtalen, A. O. Akan, N. H. C. Hwang	Fundamentals of Hydraulic Engineering Systems, 4th Edition	Prentice Hall	2009	978-0136016380

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
R. S. Gupta	Hydrology and Hydraulic Systems, 3rd Edition	Waveland Pr. Inc.	2007	978-1577664550