國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：林冠州

Instructor:Guan-Zhou Lin

課程名稱：水利工程

Course Title：Hydraulic Engineering

2026/11/3

課程代號： CT3901701 Course Code 學分數： 3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	R6(IB-512) R7(IB-512) R8(IB-512)
專業核心能力： Core Professional Competencies	□ 具有設計與執行實驗以及解讀實驗結果之能力。 an ability to design and to conduct experiments, as well as to analyze and interpret the resulting data □ 具有管理與執行工程實務以及使用現代化科技之能力。 an ability to use techniques and skills to manage or execute engineering projects and to efficiently use modern tools and technologies □ 具有設計營建工程元件及系統之能力。 an ability to plan and design components and processes in construction engineering projects □ 具有永續工程及生態環境保護之認知。 an awareness of sustainable development; a knowledge of contemporary issues; an understanding of the impact of engineering solutions in a global, economic, environmental, and societal context; and an ability to engage life-long learning.
課程網址： Course Website	
課程宗旨： Course Objectives	This course aims to equip students with a fundamental and integrated understanding of water resource systems in hydraulic engineering. In the first half of the course, students will learn the principles of flood management and water resources planning, with a focus on urban flood control, watershed hydrological processes, and the application of hydrological models. In the second half, the course emphasizes irrigation water supply systems and open-channel hydraulics, enabling students to analyze and evaluate the performance of water resource systems from an engineering perspective.
課程大綱： Outline of Lectures	

Week Date Progress Description
1 2/26 Introduction
2 3/5 Flood-damage and Management
3 3/12 Urbanization, Stormwater Runoff, and Drainage
4 3/19 Rainfall–Runoff Processes and Watershed Response
5 3/26 Water Resource Planning and Management
6 4/2 Introduction to Watershed Models (SWAT)
7 4/9 Speech (I)
8 4/16 Oral presentation(I)
9 4/23 Dams and Reservoirs
10 4/30 Irrigation and Water Supply Systems
11 5/7 Open-channel hydraulics-1
12 5/14 Open-channel hydraulics-2
13 5/21 Introduction to Hydraulic Models (HEC-RAS)
14 5/28 Oral presentation (II)
15 6/4 Speech (II)
16 6/11 Final exam

授課方式： Method of Instruction	講授 Lecture：70% 分組討論 Group discussion：0% 案例研討 Case study：30% 操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	1.Hydraulics in Civil and Environmental Engineering, by Martin, B., Andrew, C., & John, M., 2004, SPON Press.
參考書目： References	1. Open channel hydraulics. Akan, A. Osman, and Seshadri S. Iyer. Butterworth-Heinemann, 2021. 2. Davie, T. (2019). Fundamentals of hydrology. Routledge. 3. Aldaya, M. M., Chapagain, A. K., Hoekstra, A. Y., & Mekonnen, M. M. (2012). The water footprint assessment manual: Setting the global standard. Routledge.
修課須知： Notice	This course is supported by a doctoral teaching assistant, who will assist with the teaching of hydraulic and engineering computation sessions.
評量方式： Grading	Class Participation: 10% Written Reflections and Assignments: 20% Oral Presentations: 40% Final Examination: 30
備註說明： Notes	This course is conducted entirely in English(EMI) . Students are required to have completed prerequisite coursework in hydrology and fluid mechanics or other related foundational courses. The course includes two oral presentations, for which students are expected to study assigned case studies and share their analyses in class.