



National University of Engineering (UNI)

School of Civil Engineering
Syllabus 2026-II

1. COURSE

CE3H2. General Hydrology (Mandatory)

2. GENERAL INFORMATION

2.1 Course	: CE3H2. General Hydrology
2.2 Semester	: 9 th Semester.
2.3 Credits	: 3
2.4 Hours	: 2 HT; 2 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Mandatory
2.7 Learning modality	: Face to face
2.8 Prerequisites	: CE3H1. Fluid Mechanics II. (8 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

General Hydrology covers the hydrologic cycle processes relevant to water resources engineering: climatology and basic meteorology, measurement and analysis of basin-scale precipitation, hydrometric station networks, and statistical analysis of extreme hydrological events (maximum floods) using probability distributions. The course provides the hydrological analysis tools that support the design of hydraulic and water resources structures in subsequent courses of the Hydraulics line.

5. GOALS

- Understand the processes of the hydrologic cycle and estimate its components (precipitation, evaporation, runoff) at the basin scale.
- Analyze precipitation records using areal estimation methods (arithmetic, Thiessen, isohyetal, hypsometric).
- Perform frequency analysis of maximum floods applying goodness-of-fit tests and probability distributions (Normal, Log Normal, Pearson III, Log Pearson III, Gumbel).

6. COMPETENCES

ABET-1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (Usage)

ABET-6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (Usage)

7. TOPICS

Unit 1: Hydrologic Cycle and Water Balance (22 hours)	
Competences Expected: ABET-1,ABET-6	
Topics	Learning Outcomes
• Hydrologic cycle and water balance concepts • Precipitation measurement and analysis • Evaporation and evapotranspiration estimation • Infiltration theory and rainfall-runoff processes	• Explain the hydrologic cycle and quantify water balance components [Familiarity] • Analyze precipitation data and develop depth-area-duration relationships [Assessment] • Estimate evaporation and evapotranspiration using empirical methods [Usage] • Apply infiltration models to estimate runoff from rainfall events [Assessment]
Readings : [CMM88]	

Unit 2: Surface Hydrology and Watershed Modeling (17 hours)	
Competences Expected: ABET-1,ABET-6	
Topics	Learning Outcomes
• Hydrograph analysis and unit hydrograph method • Watershed modeling and hydrologic simulation • Streamflow measurement and gauging techniques	• Derive unit hydrographs and synthesize runoff hydrographs [Usage] • Develop watershed models using software tools for hydrologic simulation [Usage] • Conduct streamflow measurements and interpret flow duration curves [Assessment]
Readings : [CMM88]	

Unit 3: Flood Frequency Analysis and Climate Change (17 hours)	
Competences Expected: ABET-1,ABET-6	
Topics	Learning Outcomes
• Flood frequency analysis and design storms • Hydrologic routing methods for channels and reservoirs • Climate change impacts on hydrologic systems	• Perform flood frequency analysis using statistical methods [Assessment] • Route flood hydrographs through channels and reservoirs [Usage] • Evaluate climate change impacts on watershed hydrology and design implications [Assessment]
Readings : [CMM88]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

[CMM88] Ven Te Chow, David R. Maidment, and Larry W. Mays. *Applied Hydrology*. McGraw-Hill, 1988.