Bachelor of Engineering in Civil Engineering (4 Years, 240 ECTS)

A practice-oriented civil engineering program covering structural, geotechnical, transportation, water, and construction systems, with strong emphasis on sustainability and design standards.

Program Overview

- **Award:** B.Eng. in Civil Engineering
- **Duration:** 8 Semesters (4 academic years)
- **Total Credits:** 240 ECTS
- **Delivery:** Lectures (L), Tutorials (T), Laboratories (P), Design Studio (S), Fieldwork (F), Internship (I)
- **Workload:** 1 ECTS ≈ 25–30 hours
- **Program Pillars:** Structural Engineering • Geotechnical Engineering • Transportation Systems • Water Resources • Construction Management • Materials & Concrete • Surveying & Geomatics • BIM & Digital Construction • Sustainable Infrastructure • Safety & Ethics
- **Signature Experiences:** field surveying, BIM coordination studios, and a community-scale capstone project.

Graduate Learning Outcomes

Graduates will be able to:

1. **Infrastructure Analysis.** Analyze civil systems using mechanics, materials, and fluid principles.
2. **Design Standards.** Design structures and infrastructure using codes, standards, and safety factors.
3. **Site & Ground.** Assess soil behavior and site conditions to support safe foundations and earthworks.
4. **Water Systems.** Model water flow and design water supply, drainage, and flood mitigation solutions.
5. **Transportation.** Evaluate transport networks for safety, capacity, and sustainable mobility outcomes.

6 **Project Delivery.** Plan construction projects including cost, schedule, risk, and stakeholder coordination.

7 **Professional Practice.** Communicate clearly, work ethically, and prioritize public safety and resilience.

8 **Sustainability.** Integrate lifecycle thinking, carbon reduction, and climate adaptation into designs.

Curriculum Structure

Structured across 8 semesters (30 ECTS each). Most courses are 6 ECTS unless otherwise noted.

Year 1

Semester 1 (30 ECTS)

- Calculus I - 6 ECTS
- Engineering Physics I (Mechanics) - 6 ECTS
- Introduction to Civil Engineering - 6 ECTS
- Engineering Graphics & CAD - 6 ECTS
- Engineering Communication - 6 ECTS

Semester 2 (30 ECTS)

- Calculus II - 6 ECTS
- Engineering Physics II (E&M;) - 6 ECTS
- Statics - 6 ECTS
- Surveying & Geomatics I - 6 ECTS
- Engineering Ethics & Safety - 6 ECTS

Year 2

Semester 3 (30 ECTS)

- Mechanics of Materials - 6 ECTS
- Civil Engineering Materials (Concrete/Steel) - 6 ECTS
- Fluid Mechanics (Intro) - 6 ECTS
- Geotechnical Engineering I - 6 ECTS
- Technical Elective I - 6 ECTS

Semester 4 (30 ECTS)

- Structural Analysis I - 6 ECTS
- Hydrology & Water Resources - 6 ECTS
- Transportation Engineering I - 6 ECTS
- Construction Methods & Safety - 6 ECTS
- Technical Elective II - 6 ECTS

Year 3

Semester 5 (30 ECTS)

- Reinforced Concrete Design - 6 ECTS
- Geotechnical Engineering II (Foundations) - 6 ECTS
- Structural Analysis II - 6 ECTS
- Civil Engineering Laboratory (Materials/Soils) - 6 ECTS
- Technical Elective III - 6 ECTS

Semester 6 (30 ECTS)

- Steel Structure Design - 6 ECTS
- Transportation Engineering II (Traffic) - 6 ECTS
- Water & Wastewater Engineering - 6 ECTS
- Technical Elective IV - 6 ECTS
- Industry Internship - 6 ECTS

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Year 4

Semester 7 (30 ECTS)	• Sustainable Infrastructure & Climate Adaptation - 6 ECTS • BIM & Digital Construction - 6 ECTS • Earthquake & Wind Engineering (Intro) - 6 ECTS • Technical Elective V - 6 ECTS • Capstone Design I (Planning & Preliminary Design) - 6 ECTS
Semester 8 (30 ECTS)	• Capstone Design II (Detailed Design & Report) - 12 ECTS • Construction Project Management - 6 ECTS • Infrastructure Policy & Procurement - 6 ECTS • Advanced Seminar & Presentation - 6 ECTS

Technical Elective Tracks

Choose at least 5 electives; focus on one track for specialization.

Track A — Structures

- Bridge Engineering
- Advanced Concrete
- Structural Dynamics
- Finite Element Modeling

Track B — Water & Environment

- Stormwater Design
- River Engineering
- Treatment Processes
- Coastal Engineering

Track C — Transportation

- Public Transit Planning
- Pavement Design

- Traffic Safety
- Mobility Analytics

Track D — Construction & BIM

- Lean Construction
- Cost Estimation
- Construction Law
- Digital Twins

Laboratories & Facilities

Materials & Structures Lab

Concrete mixing, curing, and strength testing; steel testing and structural demonstration frames.

Geotechnical Lab

Soil classification, compaction, shear strength, and consolidation test equipment.

Hydraulics Lab

Open-channel flumes, pipe networks, and pumps for water flow experiments.

Surveying & BIM Studio

Total stations, GNSS equipment, and BIM software for modeling and coordination.

Capstone Design Examples

- **Net-Zero Community Center**
  Design a low-carbon structure with lifecycle considerations and passive strategies.
- **Flood-Resilient Streetscape**
  Model drainage and propose green infrastructure for runoff and heat reduction.
- **Pedestrian Safety Redesign**
  Analyze crash data and redesign an intersection for safer multimodal travel.
- **Modular Bridge Concept**
  Develop a modular bridge design with constructability, cost, and resilience analysis.