

Course Unit Title	CEH 240 Fluid Mechanics
Programme of study	BSc in Civil Engineering
Lecturer	Dr.-Ing. Paris A. Fokaides
Type of course unit	Compulsory
ECTS	5
Year of study:	2
Semester(s) offered	Spring Semester 2014, 2019 Spring Semester 2013, 2015, 2016, 2017, 2018, 2019 (laboratory module)
Course content	<ul style="list-style-type: none"> ▪ Basic fluids properties ▪ Physics of fluids in rest, hydrostatic pressure, pressure variation, buoyancy ▪ Physics of fluids in motion, Bernoulli equation, velocity and acceleration field
Course modules:	<p><u>Module 1: Fluids Properties</u></p> <ul style="list-style-type: none"> ▪ Characteristics of fluids ▪ Dimensions, dimensional homogeneity and units ▪ Measures of fluids mass and weight (density, specific weight and gravity) ▪ Viscosity ▪ Compressibility of fluids, vapour pressure, surface tension <p><u>Module 2: Fluid Statics</u></p> <ul style="list-style-type: none"> ▪ Pressure at a point ▪ Basic equation for pressure field ▪ Pressure variation in a fluid at rest ▪ Pressure measurement ▪ Hydrostatic force on a plane surface ▪ Buoyancy, flotation and stability ▪ Pressure variation in a fluid with rigid-body motion <p><u>Module 3: Fluid Dynamics and Kinematics</u></p> <ul style="list-style-type: none"> ▪ Newton's second law along and normal to a streamline ▪ Static, stagnation, dynamic and total pressure ▪ Bernoulli equation, examples of use and restrictions ▪ Velocity field ▪ Acceleration field ▪ Reynolds transport theorem <p><u>Module 4: Fluid Mechanics Laboratory Exercises</u></p> <ul style="list-style-type: none"> ▪ Laboratory Exercise 1: Buoyant Forces ▪ Laboratory Exercise 2: Measurement of fluids viscosity using a rotary viscometer ▪ Laboratory Exercise 3: Open channel flow using a water channel ▪ Laboratory Exercise 4: Volume flow rate measurement using a Venturi Tube
Textbooks:	Munson, B. R., Young, D. F., & Okiishi, T. H. (1990). Fundamentals of fluid mechanics. New York, 3(4).
Instruction language	English
External reference	link