

Course Unit Title	ME 202 Fluid Mechanics
Programme of study	BSc in Mechanical Engineering
Lecturer	Dr.-Ing. Paris A. Fokaides
Type of course unit	Compulsory
ECTS	6
Year of study:	2
Semester(s) offered	Spring Semester 2015, 2019, 2021, 2022, 2023
Course content	<ul style="list-style-type: none"> ▪ Properties of fluids ▪ Pressure and fluid statics ▪ Fluid Kinematics ▪ Momentum analysis of flow systems ▪ Flow in Pipes
Course modules:	<p><u>Module 1: Properties of fluids</u></p> <ul style="list-style-type: none"> ▪ Density and specific gravity ▪ Vapour pressure and cavitation ▪ Viscosity ▪ Surface tension and capillary effect <p><u>Module 2: Fluid statics</u></p> <ul style="list-style-type: none"> ▪ Barometer and atmospheric pressure ▪ Hydrostatic forces on submerged plane surfaces ▪ Buoyancy and stability ▪ Fluids in rigid-body motion <p><u>Module 3: Fluid kinematics</u></p> <ul style="list-style-type: none"> ▪ Lagrangian and Eulerian description ▪ The Reynolds transport theorem <p><u>Module 4: Mass, Bernoulli and energy equations</u></p> <ul style="list-style-type: none"> ▪ Conservation of mass ▪ Mechanical energy and efficiency ▪ The Bernoulli equation ▪ Energy analysis of steady flows <p><u>Module 5: Momentum analysis of flow systems</u></p> <ul style="list-style-type: none"> ▪ Newton's law and conservation of momentum ▪ Forces acting on a control volume ▪ The linear momentum equation ▪ The angular momentum equation <p><u>Module 6: Flow in pipes</u></p> <ul style="list-style-type: none"> ▪ Laminar and turbulent flows in pipes ▪ Pipping networks and pump selection ▪ Flow rate and velocity measurement <p><u>Module 7: Fluid Mechanics Laboratory Exercises</u></p> <ul style="list-style-type: none"> ▪ Laboratory Exercise 1: Buoyant Forces ▪ Laboratory Exercise 2: Measurement of fluids viscosity - rotary viscometer ▪ Laboratory Exercise 3: Open channel flow - water channel ▪ Laboratory Exercise 4: Volume flow rate measurement - Venturi Tube ▪ Laboratory Exercise 5: Impact of a jet – Linear momentum conservation
Textbooks:	Yunus, A. C., & Cimbala, J. M. (2006). Fluid mechanics: fundamentals and applications. International Edition, McGraw Hill Publication
Instruction language	English
External Reference	link