COURSE DETAIL

FLUID MECHANICS
Country Australia
Host Institution University of Melbourne
Program(s) University of Melbourne
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Engineering
UCEAP Course Number 105
UCEAP Course Suffix
UCEAP Official Title FLUID MECHANICS
UCEAP Transcript Title FLUID MECHANICS
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description
This course examines the fundamental science of fluid flow relevant to a range of engineering applications, and is essential for specializations relating to Chemical, and Civil Engineering. Topics covered: Fluid statics, manometry, derivation of the continuity equation, mechanical energy balance, friction losses in a straight pipe, Newton's law of viscosity, Fanning friction factor, treatment of roughness, valves and fittings; simple network problems; principles of open channel flow; compressible flow, propagation of pressure wave, isothermal and adiabatic flow equations in a pipe, choked flow. Pumps – pump characteristics, centrifugal pumps, derivation of theoretical head, head losses leading to the actual pump head curve, calculating system head, determining the operating point of a pumping system, throttling for flow control, cavitation and NPSH, affinity laws and pump scale-up, introduction to positive displacement pumps; stirred tanks-radial, axial and tangential flow, type of agitators, vortex elimination, the standard tank configuration, power number and power curve, dynamic and geometric similarity in scale-up; Newtonian and non-Newtonian fluids, Multi-dimensional fluid flow-momentum flux, development of multi-dimensional equations of continuity and for momentum transfer, Navier-Stokes equations, application to tube flow, Couette flow, Stokes flow.

Language(s) of Instruction
English

Host Institution Course Number
ENGR30002

Host Institution Course Title
FLUID MECHANICS

Host Institution Campus

Host Institution Faculty

Host Institution Degree

Host Institution Department
Engineering

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