

**CVX4240 Hydraulic Engineering I**

<b>Level</b>	4
<b>Course Code</b>	CVX4240
<b>Course Title</b>	Hydraulic Engineering I
<b>Credit value</b>	2
<b>Core/Optional</b>	Core (Civil Engineering)
<b>Course Aim/s</b>	To extend the student's knowledge of the principles of Hydraulics so that the student can carry out calculations related to Hydraulic systems
<b>Course Learning Outcomes (CLO):</b>	<p>At the completion of this course student will be able to</p> <p>CLO1: Apply the principles of dimensional analysis and similitude to problems in hydraulics and hydrology [Uni-structural] [Multi-structural]</p> <p>CLO2: Explain the relationship between the flow conditions and the friction factor and calculate the friction factor using an appropriate method [Uni-structural] [Multi-structural]</p> <p>CLO3: Explain the relationship between the geometry and the performance of hydraulic machines and select an appropriate hydraulic machine for a given task [Uni-structural] [Multi-structural]</p> <p>CLO4: Solve problems related to pipe networks – including junctions and pump-pipeline systems [Uni-structural] [Multi-structural]</p> <p>CLO5: Apply the principles of hydraulics to uniform open channel flow and hydraulic jumps [Uni-structural] [Multi-structural]</p> <p>CLO6: Plan and conduct experiments to verify theories and obtain coefficients related to problems in hydraulics [Uni-structural] [Multi-structural]</p>
<b>Content (Main topics, sub topics)</b>	<p><b>Outline Syllabus:</b></p> <p>Unit 1: Dimensional Analysis and Hydraulic Models            Session 01: Dimensional analysis            Session 02: Theory of hydraulic models and similitude</p> <p>Unit 2: Energy Losses in Pipelines            Session 03: Friction factor in laminar and turbulent flows, Moody diagram and approximations            Session 04: Flows in pipelines with friction</p> <p>Unit 3: Hydraulic Machines            Session 05: Theory of hydraulic machines            Session 06: Pump-pipeline systems</p> <p>Unit 4: Pipe Junctions and Pipe Networks            Session 07: Pipe junction problems            Session 08: Pipe networks and methods of solution</p> <p>Unit 5: Flow in Open Channels            Session 09: Uniform flow in open channels            Session 10: Hydraulic jump</p> <p><b>Laboratory Classes</b></p> <ol style="list-style-type: none"> <li>Centrifugal Pump</li> <li>Open Channel Flow</li> <li>Wind Turbine</li> <li>Pipe Flow</li> </ol> <p><b>Learning Activities</b></p> <ol style="list-style-type: none"> <li>Pipe Flow</li> <li>Domestic Pipe Network</li> </ol>