

Week	Topics	Reading Assignment	Content
1	Introduction Viscous flow in pipes	Chapters 8 MYO	Syllabus and administrative matters. Overview of subjects and motivation. Characteristics of viscous flow, NS equations and boundary conditions, fully developed laminar flow, velocity profiles in pipe flow, examples of solution Energy considerations in pipe flow, major losses for laminar and turbulent flow, dimensional analysis, D'Arcy-Weisbach equation, Moody diagram, Colebrook-White equation, Swamee-Jain equations, minor losses (junctions, valves, etc.) Empirical equations (Hazen-Williams, Manning), hydraulic and energy gradeline, equivalent length concept General classification, single pipe systems, problem types, examples Multiple pipe systems, pipes in series, equivalent pipes, example, vapour pressur
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4	Analysis of pipe flows	Chapter 3 HH Chapters 8, MYO	Parallel pipe systems, example Branching pipe systems, example
5	Pipe Networks	Chapter 3, HH	Definition, conditions for solution, method of solution, common pipes, inclusion of minor losses
6	Pipe Networks Waterhammer Theory Pumps Pump Selection Open Channel Hydraulics	Chapter 4-6 HH Chapters 10 MYO	Inviscid, simplified theory, differential equations Waterhammer example, surge tanks Classification, centrifugal pumps, efficiency, axial flow pumps, jet pumps Criteria for selection, selection charts, characteristic curves, example, connection of pumps (series, parallel, combined) Introduction, classification, flow resistance, uniform flow, empirical equations (Chezy, Manning), normal depth, hydraulic efficiency, best hydraulic section, channel cross sections Pressure modification due to bottom curvature, energy principle, specific energy, specific energy curves, critical flow Classification based on Froude number, depth transition, determination of critical depth discharge curves, chokes Examples, critical flow and controls, hydraulic jumps, classification
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12	Uniform Open Channel Flow	Chapter 6 HH Chapters 10 MYO	Determination of water surface profiles, the direct step method
13	Gradually Varied O.C. Flow	Chapter 6 HH Chapters 10 MYO	Determination of water surface profiles, the direct integration method .
14	Review	Chapter 6 HH Chapters 10 MYO	