
	<b>SRI VIDYA COLLEGE OF ENGINEERING &amp; TECHNOLOGY</b> <b>COURSE PLAN (THEORY)</b>	
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ACADEMIC YEAR:2018-19

Subject Code	<b>CE8394</b>	<b>L</b>	<b>P</b>	<b>T</b>	<b>C</b>
Subject Title	<b>Fluid Mechanics and Machinery</b>	4	0	0	4
Year / Dept / Sem	II/MECH/III	Regulation Year		2017	
Faculty Name / Desg / Dept	Mr.S.Chandramohan / Asso. Prof / MECH				
Course Prerequisite	Basic Knowledge about the Properties of Fluids.				
Course Objectives (CO)	CO1: The applications of the conservation laws to flow through pipes and hydraulic machines are studied CO2: To understand the importance of dimensional analysis. CO 3: To understand the importance of various types of flow in pumps and turbines.				
Expected Course Outcome (ECO)	At the end of the course, the students should be: ECO1: Upon completion of this course, the students can able to apply mathematical knowledge to predict the properties and characteristics of a fluid. ECO2: Can critically analyse the performance of pumps ECO3: Can critically analyse the performance of turbines.				

**Mapping of CO & PO(Specify the PO's) - (Fill the col.s with the legend given below)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
ECO1	B,E											
ECO2	B,C											
ECO3	B,E										H	

<b>Bridging the Curriculum Gap</b> (Additional Topics beyond syllabus / Seminars / Assignments)	BCG1: Basic law of fluids BCG2: applications of hydraulic machines
Related Website URLs	W1: <a href="http://nptel.ac.in/courses/105101082/">http://nptel.ac.in/courses/105101082/</a> W2: <a href="http://bookboon.com/en/engineering-fluid-mechanics-ebook">http://bookboon.com/en/engineering-fluid-mechanics-ebook</a> W3: <a href="http://www.learnerstv.com/Free-Engineering-Video-lectures-ltv078">http://www.learnerstv.com/Free-Engineering-Video-lectures-ltv078</a> W4: <a href="http://www.srividyaengg.ac.in/elearn1/coursematerial/Mech/114343.pdf">http://www.srividyaengg.ac.in/elearn1/coursematerial/Mech/114343.pdf</a> W5: <a href="http://www.engineeringtoolbox.com/fluid-mechanics-t_21.html">http://www.engineeringtoolbox.com/fluid-mechanics-t_21.html</a>
Related Video Course Materials (min. 4 no.s)	V1: <a href="https://www.youtube.com/watch?v=OGIkuJoQzok">https://www.youtube.com/watch?v=OGIkuJoQzok</a> V2: <a href="https://www.youtube.com/watch?v=VZXVdPoy3zs">https://www.youtube.com/watch?v=VZXVdPoy3zs</a> V3: <a href="https://www.youtube.com/watch?v=3gxNrc_EEN8">https://www.youtube.com/watch?v=3gxNrc_EEN8</a> V4: <a href="https://www.youtube.com/watch?v=BaEHVpKc-1Q">https://www.youtube.com/watch?v=BaEHVpKc-1Q</a>

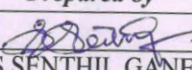
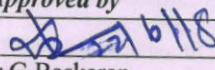
	V5: <a href="https://www.youtube.com/watch?v=k0BLOKEZ3KU">https://www.youtube.com/watch?v=k0BLOKEZ3KU</a>
Text books	T1: 1. Modi P.N. and Seth, S.M. "Hydraulics and Fluid Mechanics", Standard Book House, New Delhi 2004.
Reference Books	R1: Streeter, V. L. and Wylie E. B., "Fluid Mechanics", McGraw Hill Publishing Co. 2010 R2: Kumar K. L., "Engineering Fluid Mechanics", Eurasia Publishing House(p) Ltd., New Delhi 2004 R3: Robert W.Fox, Alan T. McDonald, Philip J.Pritchard, "Fluid Mechanics and Machinery", 2011. R4: Graebel. W.P, "Engineering Fluid Mechanics", Taylor & Francis, Indian Reprint, 2011 R5: Dr.R.K.Bansal. "Fluid Mechanics and Hydraulic Machines", Laxmi Publications (P) Ltd,

Session No	Topics to be covered (own notes)	Book	Page No	Mode of Delivery	No. of Periods	Cumulative Hours
<b>UNIT I FLUID PROPERTIES AND FLOW CHARACTERISTICS</b>					<b>12</b>	
1.	Units and dimensions	R5	559 to 560	B B	1	1
2.	Properties of fluids- mass density	R5	1,2,3 & 6	B B	1	2
3.	specific weight, specific volume, specific gravity	R5	2,3	B B	1	3
4.	Viscosity, Viscosity problems	R5	3 to 17	B B	2	5
5.	compressibility, vapor pressure	R5	21 to 22, 29	B B	1	6
6.	surface tension and capillarity, surface tension and capillarity Problems	R5	23 to 29	B B	1	7
7.	Flow characteristics- concept of control volume - application of continuity equation Energy and momentum equation - Problems	R5	163 to 173 & 695	B B	2	9
8.	Energy equation - Problems	R5	259 to 288 & 695	B B	2	11
9.	Momentum equation.	R5	288 to 298 & 702	B B	1	12
<b>UNIT II FLOW THROUGH CIRCULAR CONDUITS</b>					<b>12</b>	
1.	Hydraulic and energy gradient	R5	491 to 498	B B	1	13
2.	Laminar flow through circular conduits and circular annuli - Problems	R5	163 to 164 & 391 to 396	B B	2	15
3.	Boundary layer concepts	R5	611 to 613	B B	1	16

4.	Types of boundary layer thickness & - Problems	R5	613 to 651	B B	2	18
5.	Darcy Weisbach equation & - Problems	R5	434 to 436, 465 to 471	B B	2	20
6.	friction factor- Moody diagram	R5	433 to 437	B B	1	21
7.	commercial pipes- minor losses	R5	465, 471 to 491	B B	1	22
8.	Flow through pipes in series and parallel	R5	502 to 508	B B	1	23
9.	Flow through pipes in series and parallel-Problems	R5	508 to 524	B B	1	24
<b>UNIT III      DIMENSIONAL ANALYSIS</b>					<b>12</b>	
1.	Need for dimensional analysis	R5	559 to 561	B B	1	25
2.	Methods of dimensional analysis & Problems	R5	561 to 578	B B	2	27
3.	Similitude –types of similitude	R5	579 to 581	B B	1	28
4.	Dimensionless parameters	R5	581 to 583	B B	1	29
5.	Application of dimensionless parameters	R5	583 to 600	B B	2	31
6.	Classification of Models	R5	604	B B	2	33
7.	Classification of Models Problems	R5	606	B B	2	35
8.	Model analysis	R5	576	B B	1	36
<b>UNIT IV      PUMPS</b>					<b>12</b>	
1.	Impact of jets, Theory of roto-dynamic machines – various efficiencies, velocity components at entry and exit of the rotor-velocity triangles	R5	803 to 840	BB	2	38
2.	Euler's equation	R5	259 to 260	BB	1	39
3.	Centrifugal pumps, working principle - Work done by the impeller.	R5	945 to 978	PPT	2	41
4.	performance curves	R5	978 to 987	PPT	2	43
5.	Reciprocating pump, working principle	R5	993 to 997	PPT	1	44
6.	Classification of Reciprocating Pumps	R5	997 to 1036	PPT	2	46
7.	Comparison between centrifugal Pumps and Reciprocating Pumps	R5	1037	BB	1	47
8.	Rotary Pumps - Classification	R5	1066	PPT	1	48
<b>UNIT V      TURBINES</b>					<b>12</b>	
1.	Classification of turbines	R5	856 to 857	BB	1	49
2.	Heads and efficiencies	R5	853 to 856	BB	1	50
3.	Velocity triangles. Axial, radial and mixed flow turbines	R5	877 to 895	BB	1	51

4.	Pelton wheel	R5	857 to 877	PPT	2	53
5.	Francis turbine	R5	895 to 903	PPT	1	54
6.	Kaplan turbines- working principles - work done by water on the runner	R5	903 to 914	PPT	1	55
7.	Draft tube	R5	915 to 919	BB	1	56
8.	Specific speed	R5	920 to 927	BB	1	57
9.	Unit quantities	R5	927 to 933	BB	1	58
10.	Performance curves for turbines	R5	933 to 935	BB	1	59
11.	Governing of turbines	R5	936 to 937	BB	1	60

**TEXT BOOK:** Modi P.N. and Seth, S.M. "Hydraulics and Fluid Mechanics", Standard Book House, New Delhi 2004.

	<i>Prepared by</i>	<i>Approved by</i>
Signature		
Name	Mr.S.SENTHIL GANESH	Dr.G.Baskaran
Designation	Assistant Professor / Mech	Professor & Head
Signed date	22/06/18	22/06/18

**LEGEND:**

**METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME**

Course outcomes are achieved through

- Suitable Analogies.
- Class room teaching.
- Assignments.
- Tutorials
- Weekly, monthly and model exams.
- Brain storming.
- Group discussion and role play.
- Seminars

*Endorsed /  
Shankar  
(P.H.)*