

RAGHU ENGINEERING COLLEGE

AUTONOMOUS (Approved by AICTE, New Delhi, & Permanently Affiliated to JNTU-GV, Vizianagaram)

NBA & NAAC A+ grade Accredited institute Dakamarri, Bheemili Mandal, Visakhapatnam Dist. – 531 162 (A.P.)

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INSTITUTE VISION

Envisioning to be a world class technical institution by synergizing quality education with ethical values.

INSTITUTE MISSION

- To encourage training and research in cutting-edge technologies.
- To develop and strengthen strategic links with the industry.
- To kindle the zeal among the students and promote their quest for academic excellence.
- To encourage extra-curricular activities along with good communication skills.

QUALITY POLICY

RAGHU Engineering College underscores ethical values along with innovative teaching through an interactive, activity-based pedagogy, establishes the best of infrastructural facilities, inculcates engineering temper among the students through the use of the latest Information and Communication Technologies and strives for an efficient, responsive and transparent administration in all areas

Department of Civil Engineering

VISION

To become a pioneer in the field of civil engineering by providing high quality education and research to serve the public consistently with competitive spirit professional ethics.

MISSION

- M1: Provide quality knowledge and advance skills to the students in order to expertise theoretically and practically in the areas of civil engineering.
- M2: Improve the professional potentiality of the students and staff through educational programs to expand the knowledge in the field of civil engineering
- M3: Inculcate healthy competitive spirit towards the higher education and successful career in the field of civil engineering to serve the nation ethically.

PROGRAMME EDUCTIONAL OBJECTIVES(PEOs)

- **PEO 1**: Employ a practicing civil engineer in construction, design, testing, and allied fields.
- PEO 2: Engaging in self-directed learning research or undertaking higher studies in the rapidly changing civil engineering environment.
- PEO 3: Create new methods/processes to meet the needs of society with their civil engineering knowledge.

MAPPING OF MISSION STATEMENTS WITH PEOS

MS/PEO	PEO 1	PEO 2	PEO 3
MS 1	3	3	2
MS 2	3	3	2
MS 3	3	3	2

1-Slight, 2- Moderate, 3- Substantial

PROGRAM OUTCOMES								
	Graduates of Civil Engineering Will:							
PO 1	Engineering knowledge : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.							
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.							
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.							
PO 4	Conduct investigations of complex problems : Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.							
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.							
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.							
PO 7	Environment and sustainability : Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.							
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.							
PO 9	Individual and team work : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.							

PO 10	Communication: Communicate effectively on complex engineering activities with the
	engineering community and with society at large, such as, being able to comprehend
	and write effective reports and design documentation, make effective presentations, and
	give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the
	engineering and management principles and apply these to one's own work, as a
	member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to
	engage in independent and life-long learning in the broadest context of technological
	change.
	PROGRAM SPECIFIC OUTCOMES (PSOs)
PSO 1: A	Analyze, design and execute the civil engineering structures with good knowledge in
engineeri	ng, mathematics & basic sciences.
PSO 2: 1	Follow the economic, environmental and safety factors involved in the construction
industry.	

Mapping of PEOs with POs and PSOs

PEO/PO	PO- 1	PO- 2	РО- 3	РО- 4	PO- 5	PO- 6	РО- 7	PO- 8	РО- 9	PO- 10	РО- 11	PO- 12	PSO- 1	PSO- 2
PEO 1	3	3	3	2	3	2	2	2	3	3	3	3	3	3
PEO 2	3	3	3	2	3	2	2	1	3	3	3	3	3	2
PEO 3	3	3	3	3	3	1	1	1	2	3	2	3	3	2

1-Slight, 2- Moderate, 3- Substantial

	2301102- FI	LUID N	IECHANICS	5			
	(Civil	Engine	eering)				
Programme &Branch	B.Tech & CIVIL	Sem	Category	L	Т	Р	Credit
Prerequisites	Physics, Engineering Mechanics	3	PC	3	0	0	3
Course Object	tives :						
 To unde To deri problem To use apply th To unde To stud Preamble :	erstand the properties of fluid s ve the equation of conservation as such as finding particle path important concepts of continui- ne same to problems and to ana- erstand the various flow measu y in detail about boundary layer Fluid mechanics is the study of explores the principles gove crucial in fields like engineer provides the foundation for u and hydraulic systems, essent	and flui of mas s and str ty equat lyze lar ring dev ers theor of fluids erning fluids ring, phy understa ial for de	d statics s and its appl reamlines ion, Bernoull ninar and turb vices y and their beh luid motion, ysics, and env unding phenon esigning and a	ication an i's equation pulent flow mavior und pressure, vironment mena like analyzing	d to solon and to on and to vs er vario and fo al scien fluid fl real-wo	ve kine urbuler us cono rces, w ce. Thi low, tu rld app	ematic nce, and ditions. It which are is subject rbulence, lications.
Course Conten	ts:						0
Dimensions an vapor pressure -atmospheric,	d units – Physical properties of and their influences on fluid mo gauge and vacuum pressures-	of fluids otion, pr pressure	s – specific g ressure at a po e measuring	ravity, vis int, Pasca devices b	cosity, l's law, aromete	surface Hydros ers Ma	e tension, static law nometers
Unit-2	Hydrostatics and fluid kine	matics			Cont	act Ho	urs: 9
Hydrostatic for of pressure. Description of flows: Steady, – Equation of functions, flow	rces on submerged plane, Horiz fluid flow, Streamline, path l unsteady, uniform, non-unifor continuity for one, two, thre net analysis.	zontal, V ine and m, lami e dimen	Vertical, inclin streak line a nar, turbulent nsional flows	ned and cr nd stream , rotationa – stream	urved su tube. (and in and ve	urfaces Classifi rotatio elocity	– Center cation of nal flows potential
Unit-3	Fluid Dynamics				Cont	act Ho	urs: 9
Surface and bo equation and it Pitottube, Ven flow over recta Unit-4 Laminar Flow	dy forces–Euler's and Bernoul s application –forces on pipe b turimeter and Orificemeter – ngular, triangular and trapezoio Laminar and Turbulent Flows :Reynolds experiment–Charac	li's equ end classific dal notc s teristics	ations for flow cation of orific hes –Broad cr of Laminar,	w along a ces, small rested wei dependen	stream orifice a rs Conta ce of sh	line-Mo and larg act Hour near on	omentum ge orifice, rs: 9 pressure
gradient, flow factor, moment	through circular pipe and Flo tum correction factor	ow betw	veen parallel	plates, ki	netic er	nergy c	orrection

Turbulent flow : Introduction , shear stress in turbulent flow, various regions in turbulent flow , hydro dynamically smooth and rough pipes, velocity distribution for turbulent flow in pipes									
I Init 4	Eleve through Bings and Doundows Lover Theory	Contact Hours: 0							
Unit-	Flow through Pipes: and Boundary Layer Theory								
Flow inrough Pipes: 1:Darcy-weisbach equation, Woody's diagram, Winor losses – pipes in series									
– pipes in parallel – Total energy line and hydraulic gradient line, variation of friction factor with									
Roun	ary layer Theory : concepts Prandtl contribution Characteristics of	houndary layers along a							
thin fl	at plate laminar and turbulent boundary layers(no deviations)- separa	tion of BL, flow around							
subme	rged objects-Concept of Drag and Lift.								
		Total Hours: 45							
Text I	ooks:								
1	Fluid Mechanics, P.N. Modi and S.M.Seth, Standard book house, New	w Delhi							
2	A text of Fluid mechanics and hydraulic machines, R.K.Bansal-Laxm	i Publications(P)ltd.,							
	New Delhi.								
3	Fluid Mechanics and Hydraulic Machines – Rajput								
Refer	ence Books:								
1	Mechanics of Fluids, Merle C.Potter, David C.Wiggert and Bassem H	I.Ramadan, Cengage							
2	Learning								
2	Fluid Mechanics and Machinery, C.S.P.Ojha, R.Berndtsson and P.N. Chandramouli, Oxford								
3	Flight Education	mational							
J Weh I	r fuid Mechanics and Machinery – D. Rama Durgaian, New Age inter-								
1	https://archive.nptol.ac.in/courses/105/102/105102102/								
1	https://archive.nptel.ac.in/courses/105/105/105105192/								
	nups://arcnive.nptei.ac.in/courses/112/104/112104118/								
COUL	SE OUTCOMES:	BT Mapped							
Upon	completion of the course, students shall have ability to	(Highest Level)							
CO 1	Understand the various properties of fluids and their influence on	L2							
001	fluid motion								
CO^{2}	Calculate the forces that act on submerged planes and curves and	L3							
02	to identify and anlyse various types of fluid flows								
CO 3	Analyse a variety of problems in fluid dynamics	L4							
	Apply the fundamental laws of fluid mechanics to turbulent and	L3							
CO 4	laminar flows in order to predict relevant pressure, velocities and								
forces									
	Determine the quantities of fluid flowing in pipes, tanks and	L4							
CO 5	channels and to understand the concepts of boundary layer and								
	value problems on boundary layer								

Mapping of Cos with POs and PSOs

Mapping of Cos with POs and PSOs														
COs/POs	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PO- 12	PSO- 1	PSO- 2
CO 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 – Slight,	1 – Slight, 2 – Moderate, 3 – Substantial													

ASSES	ASSESSMENT PATERN - THEORY										
TEST	Remembering (K2)%	Understanding (K2)%	Applying (K2)%	Analyzing (K2)%	Evaluating (K2)%	Creating (K2)%	Total%				
MID-	15	20	65				100				
1											
MID-	15	20	65				100				
2											
SEE	15	20	65				100				
*± 3%	*± 3% may be varied										