DEPARTMENT OF PRODUCTION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-620015.

COURSE OUTLINE					
Course Title	**PRPC14 MECHANICS OF SOLIDS AND FLUIDS**				
Course Code	PRPC 14	No. of Credits	03		
Department	Production Engineering	Faculty	Mr P Pranith kr. Reddy		
Pre-requisites Course Code	PRPC 10				
Course Coordinator(s) (if, applicable)					
Email Id		Contact No.	9998809151		
Course Type	Programme course	✓	Elective course		
Class	3rd sem Section 'B'				

Course overview

- Studies regarding Stress, Strain and Elastic constants
- Developing Shear Force and Bending Moment Diagram for SSB and OHB
- Applying Euler's Theory on Columns.
- Working with Torsion of Circular and Hollow shafts.
- Understanding Fluid Measurements with Piezometer, manometers and gauges.
- Analysis of Fluid in One Dimensional flow

Course objectives

- To predict the behaviour of structures on loading and implement the concepts in suitable applications
- To calculate the power transmitted by shafts
- To measure fluid flows and handle fluid machineries

Course Outcomes
➢ Able to perform simple stress and strain calculations. ➢ Able to calculate the bending stresses of beams. ➢ Able to design different types of shafts and springs ➢ Understand properties of fluids. ➢ Determine flow through hydraulics machines and pipes

S.No	Week	Topic	Mode of Delivery
MECHANICS OF SOLIDS			
1	1st	Stress-Strain	PPT, C&T VIDEO
2		Elastic Constants	
3		Stress in Composite Bars	
4	2nd	Practice Problems	PPT, C&T VIDEO
5		SF and BMD of SSB	
6		Practice Problems	
7	3rd	SF and BMD of OHB	PPT, C&T VIDEO
8		Practice Problems	
9		Euler's Theory	
10	4th	Problems on Long Column	PPT, C&T VIDEO
11		Problems on Short Column	
12		Empirical Formulae	
13	5th	Torsion of Circular shafts	PPT, C&T VIDEO
14		Torsion of Circular shafts	
15		Practice Problems	
16		Power Transmission	PPT, C&T

17	Quiz 1		
MECHANICS OF FLUIDS			
18	6th	Vapour Pressure	PPT, C&T VIDEO
19		Piezometer	
20		Manometers and Gauges	
21	7th	Variation of Pressure at a Point	PPT, C&T VIDEO
22		1D Continuity Equation	
23		Bernoulli's equation	
24	8th	Venturimeter and Orifice meters	PPT, C&T VIDEO
25		Flow through pipes	
26		Laminar/Turbulent Flow	
27		Major Loses/ QUIZ 2	
28	9th	Pumps	PPT, C&T VIDEO
29		Centrifugal Pumps	
30		Efficiency and Performance	
31	10th	Cavitation in Pumps	PPT, C&T VIDEO
32		Turbines	
33		Governing of Turbines	
34	CYCLE TEST		

Text Books

1. *Ramamurtham, S, Narayan .R, "Strength of materials", 16th Edition, DhanpatRai Publishing Co, 2008.*
2. *Kothandaraman, C.P. and Rudramoorthy, R., Basic Fluid Mechanics, New Age International, 1st Edition, 1999.*

Reference Books

1. *Timoshenko S.P and J.M. Gere "Mechanics of Materials".2ndEdition, CBS Publishers and Distributors,2002*
2. *Robert, W. Fox and Allan, T. McDonald. Introduction to Fluid Mechanics, John Willey and Sons (SEA) PTE LTD.5thEdn. 2009.*

COURSE ASSESSMENT METHODS					
S.No.	**Mode of Assessment**	**Syllabus**	**Week**	**Duration**	**% Weightage**
1	Assignment 1	(MOS)	3rd Week		5
2	Quiz 1	(MOS)	5th Week	30 Minutes	15
3	Assignment 2,	(MOF)	8th Week		5
4	Quiz 2	(MOF)	8th Week	30 minutes	15
5	Cycle Test	.	10th Week	60 Minutes	20
CPA	Compensation Assessment (Written Test)	–		60 Minutes	Refer course policy
6	Descriptive Type Examination (End Semester)	–		180 Minutes	40
Total Assessment				6 Hrs	100

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail only.

2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.

ATTENDANCE

Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 75 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.

Any student, who fails to maintain 75% attendance need to appear for the compensation assessment (CPA). Student who scores more than 60 % marks in the CPA along with assessment criteria will be eligible for attending the end semester examination.

Those students who have attendance lag and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination as quoted in Pt. 2. Their scores in the CPA WILL NOT be taken into account for computing marks for CA.

Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to RE DO the course.

ASSESSMENT

1. Attending all the assessments is MANDATORY for every student.

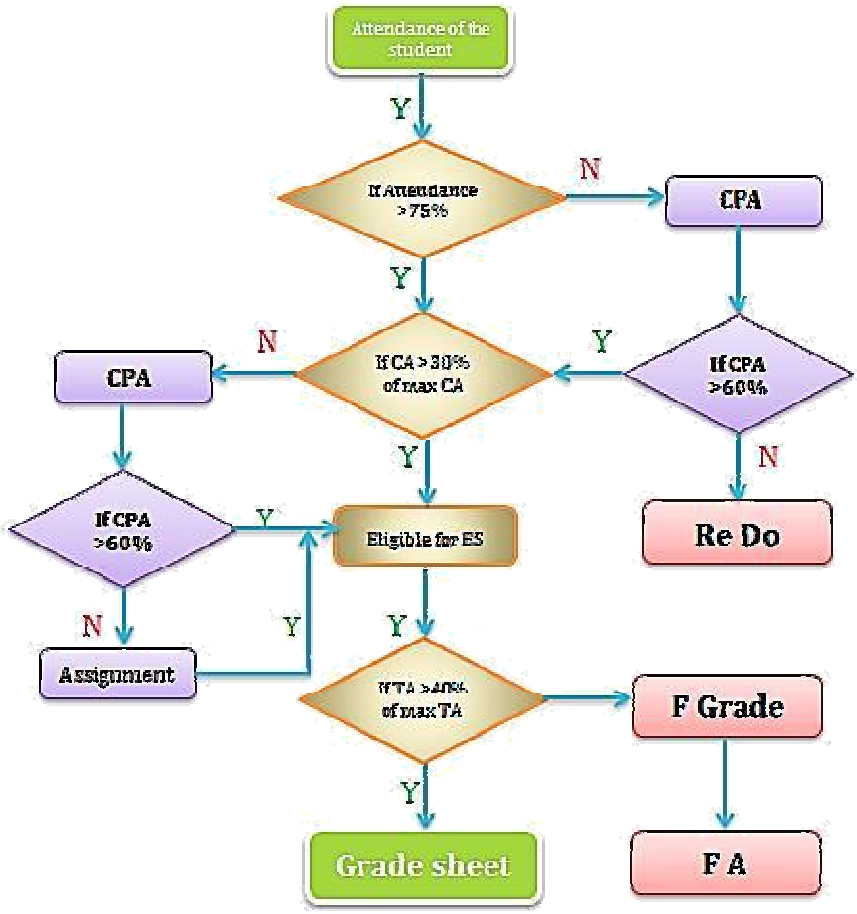
2. If any student is not able to attend any of the continuous assessments (CAs: Cycle test, Quizzes) due to genuine reason, student is permitted to attend the compensation assessment (CPA) with 20 % weightage. If any student missed one quiz of 10 % weightage then CPA will be considered for 10 % weightage. (This is not valid for students who have attendance lag also. Refer Pt. 3 under Attendance)

3. At any case, CPA will not be considered as an improvement test.
4. Students are expected to score minimum 30% of the maximum mark of the class in the CAs to attend the end semester examination in addition to the attendance requirement. Otherwise the student is permitted to attend CPA and is expected to score more than 60% marks to get eligibility to appear for end semester examination. However, the score in CPA WILL NOT be considered for computing marks for CA. Student who fails to score 60% in CPA will take up additional assignments to get eligibility for writing End Semester examination.

5. Finally, every student is expected to score minimum 40% of the maximum mark of the class in the total assessment (1, 2, 3, 4 and 5) to pass the course. Otherwise the student would be declared fail and ‘F’ grade will be awarded. Further he can take up only

FORMATIVE ASSESSMENT.

Refer the following flow chart for more clarity:



CA: Continuous Assessment Mark of a student

TA: Total Assessment Mark of a student

Max.CA : Maximum Continuous Assessment Mark of the class

Max.TA : Maximum Total

Assessment Mark of the class

FA : Formative Assessment

ES: End Semester

CPA:Compensation Assessment

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

ADDITIONAL COURSE INFORMATION

The faculty is available for consultation at times as per the intimation given by the faculty.

FOR APPROVAL

Course Faculty	CC-Chairperson	HOD