

**DEPARTMENT OF CHEMICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-620015**

COURSE PLAN – PART I			
Course Title	STRENGTH OF MATERIALS		
Course Code	CL PC10	No. of Credits	3
Course Code of Pre-requisite subject(s)	Students should have basics mathematical knowledge		
Session	Jan. 2019	Section (if, applicable)	Not Applicable
Name of Faculty	Mr.N.Murugan	Guest faculty	Chemical Engineering
Email	nmurugan@bhel.in tn72nm@gmail.com	Telephone No.	9443193363
Name of Course Coordinator(s) (if, applicable)	Dr.K. M.Meera S, Begum		
E-mail	meera@nitt.edu	Telephone No.	9489066230
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Stress (Axial Load): Normal Stress, Shear Stress, Factor of Safety, plane stress, stress components associated with arbitrary oriented faces in plane stress.</p> <p>Stress Strain Relation : Hook's Law, Poisson's ratio , Strain components, Strain components associated with arbitrary sets of axes, tensile test and elastic stress -strain relation.</p> <p>Torsion:Basic assumptions, Torsion formula, Hollow and Stepped circular shafts, Angular deflection.</p> <p>Flexural Loading : Theory of pure bending, Flexural formula, Shear force and Bending moments diagram for different types of loading and support conditions on beams. Transverse shear stress distribution in circular hollow circular, I-box and T, angle sections.</p> <p>Deflection of beams:Strain curvature and moment curvature relation, Solution of beam deflection problems by Direct integration method, Area moment method, Super position.</p> <p>Principle Stresses and Strains:Normal and Shear stress, Concept of equivalent bending & equivalent twisting moment, Mohr's circle of Stress and Strain, Strain Rosette's.</p> <p>Columns: Euler's formula for different end conditions, Concepts of equivalent length, Eccentric loading, Ranking formula.</p>			

Pressure Vessels: Thin Pressure vessel, Circumferential and longitudinal stresses in cylindrical shell, spherical shell under internal pressure. Introduction to thick Pressure vessel.

Text Books & References:

1. Ramamurtham.S, 'Strength of Materials', Dhanpat Rai & Sons, 1991.
2. Popov E.P, 'Mechanics of materials', Prentice Hall Inc. 1984
3. Andrew.P and Singer.F.L, 'Strength of materials', Happer & Row Publishers, New York 1987

COURSE OBJECTIVES

To understand the fundamental principles of stress -strain relationship. To understand the estimation of various loads and load distributions on beams.
 To evaluate the principle stresses & Strains and use of Mohr's Circle.
 To learn the concepts in design of columns and pressure vessels.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
Learn fundamental concepts of stress-strain relationship.	PO1 to PO10
Learn estimation of Torsion/ Flexural loading on beams.	PO1 to PO4, PO6, PO8 to PO10
Learn to use the concepts in design of columns and pressure vessels	PO1 to PO7, PO9 to PO11

COURSE PLAN – PART II

COURSE OVERVIEW

This course deals with advances in process design of chemical engineering process equipments

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1	Stress (Axial Load): Normal Stress, Shear Stress, Factor of Safety, plane stress, stress components associated with arbitrary oriented faces in plane stress.	Chalk and Talk
2	Week 2		
3	Week 3	Stress Strain Relation : Hook's Law, Poisson's ratio, Strain components, Strain components associated with arbitrary sets of axes, tensile test and elastic stress -strain relation.	
4	Week 4	Torsion: Basic assumptions, Torsion formula, Hollow and Stepped circular shafts, Angular deflection.	Chalk and Talk
5	Week 5		

6	Week 6	Flexural Loading : Theory of pure bending, Flexural formula, Shear force and Bending moments diagram for different types of loading and support conditions on beams. Transverse shear stress distribution in circular hollow circular, I-box and T, angle sections.	
7	Week 7		
8	Week 8	Deflection of beams: Strain curvature and moment curvature relation, Solution of beam deflection problems by Direct integration method, Area moment method, Super position. Principle Stresses and Strains: Normal and Shear stress, Concept of equivalent bending & equivalent twisting moment, Mohr's circle of Stress and Strain, Strain Rosette's.	Chalk and Talk
9	Week 9		
10	Week 10		
11	Week 11	Columns: Euler's formula for different end conditions, Concepts of equivalent length, Eccentric loading, Ranking formula. Pressure Vessels: Thin Pressure vessel, Circumferential and longitudinal stresses in cylindrical shell, spherical shell under internal pressure. Introduction to thick Pressure vessel. Outcomes:	Chalk and Talk
12	Week 12		
13	Week 13		
14	Week 14		

Semester Examination

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	1 st Assesement written mode	Week 5	1	20
2	2 nd Assesement written mode	Week 10	1	20
3	Assignment	Week 1 to 12	1	10
CPA	Compensation Assessment*	Week 11	1	20
5	Final Assessment *	Week 15		50

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Couse exit survey may be conducted at end of the end of the course. Beside this students feedback during class committee meeting before first and second assessment will be considered in a positive way and delivered in a corrective way

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc) : Email :nmtn72@gmail.com, cell :9443193363

ATTENDANCE :

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

COMPENSATION ASSESSMENT :

Student who have missed the first or second or both the Assessment test(s) can register for the Re-assessment which shall be conducted soon after the second one, but before the End semester assessment. The weightage for Re-assessment is 20% and time duration is 1 hour. The portions for Retest includes both the cycle test(s) portions.

ACADEMIC HONESTY & PLAGIARISM:

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION

1. Mandatory classes (after the semester examinations of the current session) should be attended by the students, whose attendance falls below 75% and but above 60% in this subjected concerned.
2. Students who have less than 60% of attendance have to redo the subject
3. Students who have failed in the semester examination with F Grade, those completed mandatory classes and those have missed the end semester examination shall take reassessment (supplementary examination).
4. The passing minimum is 35% or (Class average/2) whichever is greater

FOR APPROVAL

Course Faculty (N. MURUGAN)

CC-Chairperson (K. MUTHUKUMAR)

HOD (K. M. Meera S. Bgm)