DEPARTMENT OF METALLURGICAL and MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Engineering Mechanics and Strength of Materials		
Course Code	MTPC10	**No. of Credits**	04
Course Code of Pre-requisite subject(s)	NIL		
Session	**Jan 2022**	**Section (if, applicable)**	NA
Name of Faculty	DINESH P	**Department**	MME
Email	dineshp@nitt.edu	**Telephone No.**	9566782564
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	----	**Telephone No.**	----
Course Type	Core course		

Syllabus (approved in BoS)

Engineering Mechanics

Point force and distributed forces- Equivalent systems of Forces – Equilibrium of Rigid Bodies – Free body Diagram – Centroids and Center of Gravity. Dry Friction, Wedge Friction, Disk Friction (thrust bearing), Belt friction, Square of threaded screw, Journal bearings (Axle friction), Wheel friction, Rolling resistance, Moment of Inertia

Concurrent Forces in a Plane and its Equilibrium, Centroids of Composite Plane Figures, General Case of Forces in a Plane.

Moment of Inertia of Plane Figures, Parallel Axis Theorem, Polar M.I., Concept of Mass M.I.,

Strength of Materials:

Simple Stress and Strain, Stresses on Inclined Plane, Two-dimensional Stress Systems, Principal Stress and Principal Planes, Mohr's Circle.

Shearing Force and Bending Moment, Types of Loads, Types of Supports, S.F. and D.M. Diagrams for Cantilever and Simply Supported Beams under Concentrated Loads and under U.D.L.

Flexure formula, Bending Stresses on the above types of Beams and Circular Sections.

Torsion of Circular Shafts, Determination of Shear Stress.

COURSE OBJECTIVES
To enhance the knowledge in the area of rigid body mechanics. Determine the stresses, strains on various structural object, displacements in various structures and their components under the specific external loads such as axial load, bending, shear load as well as torsion.
COURSE OUTCOMES (CO) At the end of this course, the student will be able to

Course Outcomes	**Aligned Programme Outcomes (PO)**
1. solve problems dealing with forces in plane or in space and equivalent forces systems	1,2,4
2. identify, analyse and solve problems related to rigid body mechanics involving friction.	1,12
3. Understand the different types of material behavior such have elastic, plastic, ductile and brittle.	1,3,4,5
4. Study the fundamental mechanics of solid deformable bodies.	1,2,4
5. Use the concept of moment of inertia of lamina for different shapes	1,5

COURSE PLAN – PART II

COURSE OVERVIEW

It is a 4-credit compulsory course. This course introduces the principles required to solve engineering mechanics and strength of materials problems. It addresses the modeling and analysis of static equilibrium problems with an emphasis on real-world engineering applications and problem solving.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	1 week	Introduction to engineering mechanics, Point force and distributed forces-	Online teaching using MS teams with Digital Pad (power point presentation)
2.	2 week	Equivalent systems of Forces, Equilibrium of Rigid Bodies	
3.	3 week	Free body Diagram, Centroids and Center of Gravity.	
4.	4 week	Concurrent Forces in a Plane and its Equilibrium, Centroids of Composite Plane Figures, General Case of Forces in a Plane.	
5.	5 week	Moment of Inertia, Moment of Inertia of Plane Figures, Parallel Axis Theorem, Polar M.I., Concept of Mass M.I.,	

6.	6 week	Dry Friction, Wedge Friction, Disk Friction (thrust bearing), Belt friction, Square of threaded screw, Journal bearings (Axle friction), Wheel friction, Rolling resistance	
7.	7 week	Simple Stress and Strain, Stresses on Inclined Plane	
8.	8 week	Two-dimensional Stress Systems, Principal Stress and Principal Planes, Mohr's Circle.	
9.	9 week	Shearing Force and Bending Moment, Types of Loads, Types of Supports,	
10.	10 week	S.F. and D.M. Diagrams for Cantilever and Simply Supported Beams under Concentrated Loads and under U.D.L.	
11.	11 week	Flexure formula, Bending Stresses on the above types of Beams and Circular Sections.	
12.	12 week	Torsion of Circular Shafts, Determination of Shear Stress.	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration (min)	% Weightage
1	Cycle Test -I	VI	60	25
2	Assignment	VII	-	10
3	Cycle Test -II	X	60	25
4	Quiz	XI	-	10
CPA	Compensation Assessment	X	60	25
5	End semester Examination	XIII	120	30

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

Standard feedback as per institute norms

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: dineshp@nitt.edu
Mobile: 9566782564

ATTENDANCE

- Minimum 75% excluding ODs.
- Medical certificate for genuine cases is permitted

COMPENSATION ASSESSMENT

It will be given during IX week for those who are absent on genuine grounds for any one of the cycle tests.

ACADEMIC HONESTY & PLAGIARISM

Plagiarism will be checked for assignments.

ADDITIONAL INFORMATION

The Course faculty is available for consultation at any time. Students can also contact him at any time through phone or by mail. The phone number and mail id will be given to the students at the beginning of the course

Course Faculty (Dr. Dinesh P)	**CC-Chairperson (Dr. N. Ramesh Babu)**	**HOD (Dr. B. Ravi shankar)**