

**DEPARTMENT OF PRODUCTION ENGINEERING**  
**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	<b>B.Tech. Production Engineering</b>		
<b>Course Title</b>	<b>Applied Mechanics</b>		
<b>Course Code</b>	<b>PRPC10</b>	<b>No. of Credits</b>	<b>4</b>
<b>Course Code of Pre-requisite subject(s)</b>	Physics	Complex Analysis	Differential Equations
<b>Session</b>	<b>Jan 2023</b>	<b>Section (if, applicable)</b>	<b>A&amp;B</b>
<b>Name of Faculty</b>	<b>Dr.Prakashkumar Dr.Satheeshkumar V.</b>	<b>Department</b>	<b>Production Engineering</b>
<b>Email</b>	<a href="mailto:prakashkumar@nitt.edu">prakashkumar@nitt.edu</a> <a href="mailto:satheeshv@nitt.edu">satheeshv@nitt.edu</a>	<b>Telephone No.</b>	<b>0431 2503503</b>
<b>Name of Course Coordinator(s) (if, applicable)</b>	-		
<b>E-mail</b>	-	<b>Telephone No.</b>	-
<b>Course Type</b>	<input checked="" type="checkbox"/> <b>Core course</b> <input type="checkbox"/> <b>Elective course</b>		
<b>Syllabus (approved in BoS)</b>			
<p>Review of Forces and Moments, Introduction to Equilibrium, Application of the Equations of Equilibrium, Friction, Forces and Moments Transmitted by Slender Members, Shear Force and Bending Moment Diagrams. Mechanics of Deformable Bodies            Force-Stress-Equilibrium, Multiaxial Stress and Strain, Multiaxial Strain and Multiaxial Stress-strain Relationships, Linear Elasticity - Material Behaviour, Stress Transformations and Principal Stress, Stress and Strain Transformations, Failure of Materials            Pure Bending, Moment-curvature Relationship, Beam Deflection, Symmetry, Superposition, and Statically Indeterminate Beams, Torsion and Twisting, Energy Methods.</p> <p><b>REFERENCES:</b></p> <ol style="list-style-type: none"> <li>1. R. C.Hibbeler, Mechanics of Materials (SI Edition), Pearson Prentice Hall, 9<sup>th</sup> Ed,</li> <li>2. Crandall, S. H., N. C. Dahl, and T. J. Lardner, <i>An Introduction to the Mechanics of Solids</i>. 3rd ed. Tata McGraw Hill, 2017.</li> <li>3. Egor P Popov, "Engineering Mechanics of Solids", 2<sup>nd</sup> Edition, Prentice Hall of India., 2008.</li> </ol>			

<b>COURSE OBJECTIVES</b>	
<ol style="list-style-type: none"> <li>1. To understand the fundamental concepts of stress and strain and the relationship between both through the strain-stress equations.</li> <li>2. To solve problems relating to pure and non-uniform bending, torsional deformation of bars.</li> <li>3. To understand the concept of buckling and be able to solve the problems related to isolated bars.</li> </ol>	
<b>COURSE OUTCOMES (CO)</b>	
<b>Course Outcomes</b>	<b>Aligned Programme Outcomes (PO)</b>
1. Understand the fundamental concepts of stress and strain and the relationship between both through the strain-stress equations	PO1, PO2, PO6, PO7, PO12
2. Solve problems relating to pure and non-uniform bending, torsional deformation of bars.	PO1, PO2, PO4, PO6, PO7, PO9, PO12
3. Understand the concept of buckling and be able to solve the problems related to isolated bars.	PO1, PO2, PO4, PO6, PO7, PO12

<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	Week 1 – 4 hr	Review of Forces and Moments, Introduction to Equilibrium	Chalk and Talk/PPT
2	Week 2 – 4 hr	Application of the Equations of Equilibrium, Friction	Chalk and Talk/PPT
3	Week 3 – 4 hr	Forces and Moments Transmitted by Slender Members	Chalk and Talk/PPT
4	Week 4 – 4 hr	Shear Force and Bending Moment Diagrams	Chalk and Talk/PPT
5	Week 5 – 4 hr	Mechanics of Deformable Bodies, Force-Stress-Equilibrium	Chalk and Talk/PPT

6	Week 6 – 4 hr	Multiaxial Stress and Strain, Multiaxial Stress-strain Relationships	Chalk and Talk/PPT
7	Week 7 – 4 hr	Linear Elasticity - Material Behaviour	Chalk and Talk/PPT
8	Week 8 – 4 hr	Stress Transformations and Principal Stress, Stress and Strain Transformations, Failure of Materials	Chalk and Talk/PPT
9	Week 9 – 4 hr	Pure Bending, Moment-curvature Relationship	Chalk and Talk/PPT
10	Week 10 – 4 hr	Beam Deflection, Symmetry, Superposition, and Statically Indeterminate Beams	Chalk and Talk/PPT
11	Week 11 – 4 hr	Torsion and Twisting and Energy Methods.	Chalk and Talk/PPT
12	Week 12 – 4 hr		

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Class Test I	4 <sup>th</sup> Week	1 hr	20
2	Class Test II	8 <sup>th</sup> Week	1 hr	20
3	Assignment	Every week	-	20
CPA	Compensation Assessment*	-	1 hr	20
4	Final Assessment *	-	3 hr	40

**\*mandatory; refer to guidelines on page 4**

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

FEEDBACK FORM

**COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)**

**MODE OF CORRESPONDENCE (email/ phone etc)**

**Email: prakashkumar@nitt.edu;**

**satheeshv@nitt.edu**

**Phone: 04312503503; 9952648848**

### **COMPENSATION ASSESSMENT POLICY**

Only on Medical Grounds with prior intimation.

### **ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- **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.**

### **ACADEMIC DISHONESTY & 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**

-NIL-

### **FOR APPROVAL**



(Dr.Prakashkumar)



(Dr.Satheeshkumar V)



Course Faculty \_\_\_\_\_

CC-Chairperson \_\_\_\_\_  
(Dr.Vineet Kumar Yadav)



HOD \_\_\_\_\_  
(Dr.C.Sathiya Narayanan)

**Guidelines:**

- a) The number of assessments for a course shall range from 4 to 6.
- b) Every course shall have a final assessment on the entire syllabus with at least 30% weightage.**
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered. Details of compensation assessment to be specified by faculty.**
- d) The passing minimum shall be as per the regulations.**
- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.**
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.**
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.