



DEPARTMENT OF PRODUCTION ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	Production Engineering		
Course Title	Design of machine elements		
Course Code	PRPC20	No. of Credits	04
Course Code of Pre-requisite subject(s)	PRPC14 and PRPC10		
Session	July 2019	Section (if, applicable)	A & B
Name of Faculty	Dr.V.Senthilkumar	Department	Production Engineering
Official Email	vskumar@nitt.edu	Telephone No.	04312503519
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Introduction to the design process, factor influencing machine design, mechanical properties of materials, direct stress, bending stress, torsional stress and variable stress in machine parts, theories of failure, stress concentration factor, factor of safety.</p> <p>Design of shafts based on bending moment, twisting moment, combined of bending and twisting moments, axial loads in addition to combined torsional and bending loads, rigidity and stiffness. Design of spring.</p> <p>Belt and chain drives: selection of flat belt, V belt and chain drives. Design of couplings, keys and bearings.</p> <p>Welded joints: types of joints, welding symbol and weld symbol and their representation, strength of welded joints subjected to various types of load. Riveted joints: types of joints, design of riveted joints for structure.</p> <p>Design of spur and helical gears. Design of gear box: layout diagram, speed diagram, fixing number of teeth and module of gears.</p> <p>TEXT BOOKS: 1.Bhandari, V.B., "Design of Machine Elements", Tata McGraw-Hill, 2007. 2.Prabhu, T.J. "Design of Transmission Elements", Mani Offset, Chennai, 2005.</p>			



REFERENCES:

1. Shigley, J.E. and Mischke, C.R. "Mechanical Engineering Design" Tata McGraw Hill, 2006.
2. Sharma, C.S. and Purohit, K. "Design of Machine Elements", Eurasia Publishing House (P) Ltd, New Delhi, 2005

COURSE OBJECTIVES

- To understand material properties, design process and various theories of failures
- To design various basic machine components
- To design new components based on design principles

MAPPING OF COs with Pos

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Understand the various theories of failures	PO1,PO2
2. Design various machine components	PO3,PO6
3. Design new components based on the design principle	PO1,PO2

COURSE PLAN – PART II

COURSE OVERVIEW

- To study about the basic design concepts and procedure while designing any parts
- Brief into and detailed study about stresses developed on the machine elements and theory of failure
- To study about design of shafts based on different loading conditions and design of springs
- To study about the design of belt drives, chain drive, coupling, keys and bearing
- To study about welded and riveted joints based on their design consideration and failure theories
- To study about design of spur and helical gears based on layout diagram, speed diagram, fixing number of teeth and module of gears

COURSE TEACHING AND LEARNING ACTIVITIES

S.No	Week/Contact Hours	Topic	Mode of Delivery
1	1 st	Introduction to the design process, factors influencing machine design, mechanical properties of materials, direct stress, bending stress	PPT, C&T VIDEO



2	2 nd	Torsional stress and variable stress in machine parts, theories of failure, stress concentration factor, factor of safety	PPT, C&T VIDEO
3	3 rd	Design of shafts based on bending moment, twisting moment, combined of bending and twisting moments	PPT, C&T VIDEO
4	4 th	Design of shafts based on axial loads in addition to combined torsional and bending loads, rigidity and stiffness	PPT, C&T VIDEO
5	5 th	Introduction to spring and Design of spring, Belt and chain drives	PPT, C&T VIDEO
CYCLE TEST 1			
6 th	6 th	Selection of flat belt, V belt drives, Selection of chain drives,	PPT, C&T VIDEO
7	7 th	Design of coupling, Design of keys and bearings	PPT, C&T VIDEO
8	8 th	Welded joints: types of joints, welding symbol and weld symbol and their representation, Welded Joints: strength of welded joints subjected to various types of load	PPT, C&T VIDEO
CYCLE TEST-2			
9	9 th	Riveted joint introduction, Riveted joint introduction, Introduction to gears and its types. Design of spur gears.	PPT, C&T VIDEO



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10	10 th	Design of helical gears, Design of gear box: layout diagram, speed diagram, fixing number of teeth and module of gears	PPT, C&T VIDEO	
COMPENSATION ASSESMENT				
11	11 th	FINAL ASSESMENT		
COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle test -1	End of 5 th week	60 Minutes	20
2	Cycle test -2	End of 8 th week	60 Minutes	20
3	Assignment	Once in four weeks	-----	10
CPA	Compensation Assessment*	End of 10 th week	60 Minutes	20
4	Final Assessment *	End of semester	180 Minutes	50
*mandatory; refer to guidelines on page 4				
COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)				
<ol style="list-style-type: none"> 1. Feedback from the students during class committee meeting. 2. End semester feedback on course outcomes 				
COURSE POLICY (including compensation assessment to be specified)				
<ul style="list-style-type: none"> • Attending classes regularly and continuously is required for the students to understand the concepts. • Attendance will be taken in every class. If the student is not able to maintain 75% attendance, he/she is required to write the compensation assessment and obtain a minimum of 15 marks to become eligible to write the final assessment. • Participation in the discussions is mandatory during the tutorial classes. • Strict academic disciplines have to be maintained inside the class room. • If any student is not able to attend any of the continuous assessments (1, 2, and 3) due to genuine reason, student is permitted to attend the compensation assessment with % weightage equal to maximum of the CAs. However, a student absent for more than one CAs, maximum of the % weightage among the assessments for which the student was absent will be considered for computing marks for CA. 				



- Reassessment shall be conducted for failed / absented (in final assessment) in the beginning of next session. Failed (in final assessment) candidates shall get a maximum of E grade in the reassessment.

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.

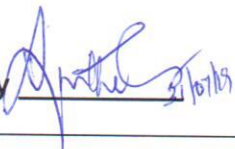
ACADEMIC DISHONESTY & PLAGIARISM

- 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.

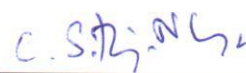
ADDITIONAL INFORMATION, IF ANY

FOR APPROVAL

Course Faculty



CC- Chairperson



HOD





Guidelines

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory 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.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- 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.