

Course Number and Name	
BME501 - <b>MACHINE DESIGN - I</b>	
Credits and Contact Hours	
4&75	
Course Coordinator's Name	
Mr.V.Jose Anandh Vino	
Text Books and References	
<p><b>TEXT BOOKS :</b></p> <p>1. Prabhu T.J. – Fundamentals of Machine Design, 2009.</p> <p><b>REFERENCES :</b></p> <p>1. Bhandari V.B – Design of Machine Elements - TataMcGraw Hill, 2007.</p> <p>2. Shigley J.E. &amp; Misheka – Mechanical Engineering Design2004 – McGraw Hill,2007.</p> <p>3. Dobrovolsky, Machine Elements – Mir Publications, 1978.</p> <p>4. Pandya &amp; Shah – Elements of Machine Design, 2000.</p> <p>5. Design Data, PSG College of Technology, 2007.</p> <p>6. <a href="http://www.allexamresults.net/.../download-pdf-textbook-of-thermal-engineeri...">www.allexamresults.net/.../download-pdf-textbook-of-thermal-engineeri...</a></p>	
Course Description	
To understand the principles involved in evaluating the shape and dimensions of a component to satisfy functional and strength requirements.	
To learn & use standard practices and standard data of design parameters.	
Prerequisites	Co-requisites
ENGINEERING MECHANICS AND DYNAMICS OF MACHINES	Nil
required, elective, or selected elective (as per Table 5-1)	
Required	
Course Outcomes (COs)	
CO1	Students will learn to design components
CO2	Students will understand how to select a material
CO3	Students will learn to use the design data book
CO4	Students will learn to obtain an optimum design procedure
CO5	Students will understand various concepts in design
CO6	Students will learn to fabricate/do research using their knowledge attained
Student Outcomes (SOs) from Criterion 3 covered by this Course	

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	L		H				M					
CO2		H	H				M					
CO3							M	H				
CO4									H	H		
CO5							M			H	H	
CO6							M					L

### List of Topics Covered

#### UNIT I FUNDAMENTALS

9+6

Design process – Engineering Materials and Mechanical properties – Eccentric loading – Principal stresses – Design criteria – Calculation of permissible stress – Failure theories – Stress Concentration – Design for variable loading – Soderberg, Goodman and Gerberg relations - Introduction to Fracture Mechanics. Introduction to Optimum Design

#### UNIT II DESIGN OF SHAFTS

9+6

Design of Shafts using fatigue factors – Shafts carrying pulleys gears – overhanging and simply Supported Shafts - Hollow shafts - Design of Axles.

#### UNIT III DESIGN OF SPRINGS

9+6

Design of tension and compression Helical springs – Springs for Buffers – Springs for impact loads – Concentric springs - Springs in series and parallel connection – Design of Leaf springs – Semi elliptical cantilever type.

#### UNIT IV DESIGN OF RIVETED & WELDED JOINTS

9+6

Design of riveted joint for a Boiler – Lozenge joint – Design of eccentrically loaded riveted joints – Design of Welded joints.

#### UNIT V DESIGN OF BOLTED JOINTS & COUPLINGS

9+6

Design of eccentrically loaded bolted joints – Screw fastenings – Gasket joints for cylinders – Design of Rigid couplings, Pin and Bush type flexible couplings, Muff coupling and Clamp coupling.