

<b>Course Number and Name</b>	
BME203 & Basic Mechanical Engineering	
<b>Credits and Contact Hours</b>	
2 & 30	
<b>Course Coordinator's Name</b>	
Mr.Saravana Kumar	
<b>Text Books and References</b>	
<b>Textbooks:</b>	
1. T.J.Prabhueta, "BasicMechanicalEngineering", SciTechPublications(p)Ltd,2000	
<b>References:</b>	
1. NAGPAL,G.R,"PowerplantEngineering",KhannaPublishers,2004.	
2. RAO.P.N,"ManufacturingTechnology",TataMcGraw-HillEducation,2000.	
3. Kalpakjian,"ManufacturingEngineeringandTechnology",AdissoWesleypublishers,1995.	
4. Ganesan.V,"Internalcombustionengines",TataMcGraw-HillEducation,2000.	
5. C.P.Arora,"RefrigerationandAir Conditioning",TataMcGraw-HillEducation,2001.	
6. V.B.Bhandari,"DesignofMachineelements",TataMcGraw-HillEducation,2010.	
<b>Course Description</b>	
<ul style="list-style-type: none"> <li>• The program educational objectives (PEOs) for the mechanical-engineering program are to educate graduates who will be ethical, productive, and contributing members of society.</li> <li>• The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.</li> <li>• The ability to apply principles of engineering, basic science, and mathematics to design and realize physical systems, components, or processes</li> </ul>	
<b>Prerequisites</b>	<b>Co-requisites</b>
+2 Level Maths& Physical Science	Nil
required, elective, or selected elective (as per Table 5-1)	
Required	
<b>Course Outcomes (COs)</b>	
<p>Co1: an ability to apply knowledge of mathematics</p> <p>Co2: an ability to apply knowledge of science, and engineering</p> <p>Co3: ability to design and conduct experiments, as well as to analyze and interpret data.</p> <p>Co4: an ability to function on multi-disciplinary teams</p> <p>Co5: to provide basic knowledge of basic manufacturing process.</p> <p>Co6: an ability to identify, formulate, and solve engineering problems</p>	
<b>Student Outcomes (SOs) from Criterion 3 covered by this Course</b>	

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

### List of Topics Covered

#### **UNIT I ENERGY RESOURCES AND POWER GENERATION 6**

Renewable and Non-renewable resources - solar, wind, geothermal, steam, nuclear and hydro power plants - Layout, major components and working. Importance of Energy storage, Environmental constraints of power generation using fossil fuels and nuclear energy.

#### **UNIT II IC ENGINES 6**

Classification, working principles of petrol and diesel engines - two stroke and four stroke cycles, functions of main components of I.C. engine. Alternate fuels and emission control.

#### **UNIT III REFRIGERATION AND AIR-CONDITIONING SYSTEM 6**

Terminology of Refrigeration and Air-Conditioning, Principle of Vapor Compression & Absorption systems. Layout of typical domestic refrigerator - window & Split type room air conditioner.

#### **UNIT IV MANUFACTURING PROCESSES 6**

Brief description of Moulding and casting process, Metal forming, Classification types of forging, forging operations, Brief description of extrusion, rolling, sheet forging, and drawing. Brief description of welding, brazing and soldering. Principal metal cutting processes and cutting tools, description of Centre lathe and radial drilling machine.

#### **UNIT V MECHANICAL DESIGN 6**

Mechanical properties of material - Yield strength, ultimate strength, endurance limit etc., Stress-Strain curves of materials. Stresses induced in simple elements. Factor of safety - Design of Shafts and Types of bearings and its applications. Introduction to CAD/CAM/CIM & Mechatronics.