VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
B.E- III
Mechanical
Semester -VI
MED 601 M Machine Design-I

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td>Marks</td>
<td>Examination 60</td>
<td></td>
</tr>
</tbody>
</table>

1. Introduction: The Design process, morphology of design. Designing methods, concurrent engineering.
4. Design of Machine Components: Parts subjected to tension, compression, shear, bending, and torsion such as tie rods, push rods, levers, etc. Parts subjected to combined loads, such as overhangs, etc. Design of helical compression and extension springs, leaf springs.
6. Design of Screw and Threaded Fasteners: Types of screw threads, Indian standard proportions, design of power screw. Threaded fastness types of bolts and connections, stresses and preloading of flanged connections, gaskets, bolts of uniform strength, eccentrically loaded bolted connection.
7. Design of Shafts: Types of shaft, ASME code for design of shafts, critical speed, design of keys and splines.
9. Thick and thin cylinders, shank fitted, and pressfitted connections.
10. Manufacturing Consideration: Standardization, limits, fits, and tolerances as per I.S. Specification factors to be considered in design of casting, forgings, and welded components.

Practicals: Based on the above syllabus, each student has to prepare assembly/details drawing and has to submit the design reports at least four design and set of design problems.

REFERENCES:
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.E- III
Mechanical
Semester -VI

MED 602 M I.C Engine & Automotive Engineering

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination Scheme</td>
<td>100</td>
<td>00</td>
<td>Continuous Evaluations 20</td>
</tr>
<tr>
<td>Marks</td>
<td>Examination 30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Introduction to I.C. Engines.
5. Requirements of diesel injection systems types of injection systems. Fuel pumps.
6. Various systems of I.C Engines. Lubrication systems, cooling systems etc.
8. Engine Emission: Pollutants and their ill effects pollutants from Gasoline and diesel in their control.
9. Modern Developments: Alternate Fuel Engines, Alcohol hydrogen etc.
10. Lay-out transmission systems automotive vehicle: Types and its components and braking and suspension systems of automotive Vehicle: Various types, steering systems type function. Electrical systems of automotive vehicle, chasis, Wheels, Types of tyres.

**Practicals:** Based on the above syllabus a minimum eight practicals are to be performed

**REFERENCES:**
3. Newton and Steed; Automobile Engineering, ELBS Publishing (1978)
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
B.E- III
Mechanical
Semester -VI
MED 603 M Refrigeration and Air-Conditioning

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Examination</td>
</tr>
</tbody>
</table>

5. Load Calculation: Calculation of summer and winter loads. Heat gram through walls. Roofs, floors, windows and Doors.
6. Air conditioning systems and Equipments humidifiers, dehumidifiers, air cleaning impurities in air and air cleaners. Air washers, duets pressure drop in duets.

**Practicals:** Based on the above syllabus a minimum eight practicals are to be performed

**REFERENCES:**
1. Arora S.C and Domkundwar; A course in Refrigeration and Air-conditioning, Dhanpat Rai and Sons.(1997)
1. Productivity : Production and Productivity factors affecting productivity management techniques for increasing Productivity improvement human aspects, measurements of Productivity
2. Production Planning &Control: History and Function, sales for casting, product life cycles, sales for casting techniques such as a Judgmental. delphi and and user’s expections techniques, time series analysis regression and correlation methods exponential smoothing techniques etc.
3. Inventory Control: Inventory costs and Inventory management systems .ABC analysis, EOQ models, -EOQ-with Storage discount for production runs safety stocks. Case study.
5. Work-Sampling: Methods fro work sampling, control charts, Estimation of utilization, delays and standard time, bias.
6. Production Study and PMTS: Checking validity of time standard. Verification of fatigue, contingent and personal needs allowness PMTS.
8. Cost and Investment analysis : Break even analysis , make or buy decision, Depreciation ,annual cost method, present value method, rate of return method, payable period method.
9. Value Analysis: Value and its type, cost control, and cost reduction, value Engineering, value control, procedure and applications value of analysis.

REFERENCES:
5. Introduction to work-study ILO (1977)
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.E- III
Mechanical
Semester -VI

MED 605 M Tribology and Machine Dynamics

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination Scheme</td>
<td>100</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Marks</td>
<td>100</td>
<td>0</td>
<td>20 Examination 30</td>
</tr>
</tbody>
</table>

1. Introduction to Tribology and surface topography.
2. Concept of friction and wear and measurement techniques
3. Properties of testing and lubricants.
4. Regimes of lubrication applications of lubrication mechanism in bearing design.
   Basic concept of hydrodynamic lubrication theory.
5. Hydrostatic and Boundary lubrication.
8. Damped free vibration of single degree of freedom systems: Different type of dampings, free vibrations with viscous damping, over damped critically damped under-damped systems.
9. Forced vibration of single degree of freedom systems: Forced vibration with constant harmonic excitation, with rotating and reciprocating unbalance, due to the support, vibration isolation and transmissibility, measuring instrumentation displacement, velocity acceleration, frequency instrument.
10. Whirling and critical speed of shafts, introduction to multi-degree of freedom systems.

Practicals: Based on the above syllabus a minimum eight practicals are to be performed

REFERENCES:
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B.E- III
Mechanical
Semester -VI

MED 606 M Computer Aided Engineering Analysis

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Examination Scheme</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Marks</td>
<td>Examination 00</td>
<td></td>
</tr>
</tbody>
</table>

1. Introduction to Computer Aided Engineering: Types of problems encounter in Mechanical Engineering Classification of problems based on method of solution.
2. Solution of systems of Algebraic Equations: Gauss Elimination, Matrix inversion, Gauss seidel, L-U decomposition, Newton Rephson methods and their application to mechanical engineering Problems
3. Curve Fitting: Least squares regression analysis, Newton and language interpolating polynomials
8. Software: Introduction to some software used in CAE, Solving simple problems using computer.

REFERENCES: