

SVM Institute of Technology, Bharuch  
 Department of Mechanical Engineering  
 Syllabus: Re-Mid Semester examination (Even sem 2018-19)  
 BE – III(5<sup>th</sup> Sem)

**Name of Faculty:** Prof. Vishal Sukhadia, Prof. B.C. Patel, Prof. Vijay Parekh.

**Subject Code:** 2151907

**Subject Name:** DESIGN OF MACHINE ELEMENTS

Sr. No.	Unit	Topics
1	Unit 1	<ul style="list-style-type: none"> <li>• <b>Introduction:</b> Design procedure, Selection of preferred sizes, Aesthetic and Ergonomic considerations in Design, Manufacturing considerations in Design, Mechanical Properties of Materials, Effect of Alloying elements and heat treatment on properties of steels, Materials Selection in Machine Design, IS coding of steels and Cast Irons</li> </ul>
2	Unit 3	<ul style="list-style-type: none"> <li>• <b>Design of Springs:</b> Classification of springs, Helical Spring: Style of ends, Stresses, Correction Factors, and Deflection, Design against static and fluctuating loads, concentric springs, surge phenomenon. Helical Torsion and Spiral Springs, Belleville spring, shot peening of springs. Multi-Leaf Spring: Terminology, Nipping, and Design of multi-leaf spring.</li> </ul>
3	Unit 4	<ul style="list-style-type: none"> <li>• <b>Belt and Chain Drives:</b> Flat Belt Drive: Belt Construction, Flat Belt Drive: Length of the Belt: Open and Cross drive types, Ratio of Tensions on tight side to slack side, Condition for maximum power transmission, Creep phenomenon, Methods for tensioning, Selection of Belts from catalogues, Design of Pulley for flat belt drive. Timing belt selection. V-Belt Drive: Nomenclature, Selection of V Belts from catalogues. Chain Drive: Nomenclature of roller chains, Length and power rating of chains, Design of chain drive.</li> </ul>

Text Book:

1. V B Bhandari, Design of Machine Elements, 3/e, McGraw Hill.
2. R L Norton, Machine Design An Introduction, Pearson.

SVM Institute of Technology, Bharuch  
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Syllabus: Backlog examination (even sem 2018-19)  
BE – II (5<sup>th</sup> Sem) Mechanical

**Name of Faculty:**Dr. D.C. Gosai, Nirmal Kumar & Sumit Rathod

**Subject Code:**2151903

**Subject Name:**Fluid Power Eng.

Sr. No.	Unit	Topics
1	Unit 1	<b>Hydropower Plant:</b> Introduction, Major applications of hydropower plant, Classification of hydropower plant, Essential components of hydropower plant, Advantages and disadvantages of hydropower plant, selection of site for a hydropower plant
2	Unit 2	<b>Impact of Jet:</b> Introduction, Force exerted on stationary plate held normal and inclined to jet, Force exerted on curved plate, force exerted on moving plate held normal and inclined in direction of moving jet, Force on a plate when vane is moving in direction of jet, jet striking on curved vane tangentially at one tip and leaving at other end, jet propulsion in ships
3	Unit 3	<b>Hydraulic Turbines:</b> Introduction, Classification of turbines, Impulse and reaction turbines, construction, working and performance of Pelton, Francis and Kaplan Turbines, Draft tube, Governing of hydraulic turbines, Cavitation
4	Unit 4	<b>Centrifugal Pumps:</b> Pump classification and selection criterion, Centrifugal pumps, Velocity vector diagrams, Pump losses and efficiencies, Net positive suction head, Pressure rise in impeller, Characteristic curves of centrifugal pumps, priming, maximum suction limit - minimum starting speed to deliver the discharge, Multistage pumps, cavitation, pump selection
5	Unit 8	<b>Centrifugal Compressors:</b> Essential parts, Static and total head properties, Velocity diagram, Degree of reaction, surging and choking, Losses in centrifugal compressor

Text Book:

1. Fluid Mechanics and Hydraulic Machines- R.K. Bansal
2. Fluid Power Engineering 8<sup>th</sup> edition- J.P.hadiya, books India publication

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Department of Mechanical Engineering  
Syllabus: Backlog examination (even sem 2018-19)

**Name of Faculty:** Krishna Kumar **Subject Name:** Heat Transfer **Subject Code:** 2151909

Sr. No.	Unit	TOPICS
1	Unit 1.	<b>Introduction:</b> Modes of heat transfer, effect of temperature on thermal conductivity of different solids, liquids and gases, derivation of generalized equation in Cartesian, cylindrical and spherical coordinates and its reduction to specific cases, General laws of heat transfer.
2	Unit 2.	<b>Conduction:</b> Fourier's law, One dimensional steady state conduction, heat conduction through plane and composite walls, cylinders and spheres, electrical analogy, critical radius of insulation for cylinder and sphere, overall heat transfer coefficient. <b>Transient heat conduction-</b> lumped heat capacity analysis, time constant, transient heat conduction in solids with finite conduction and convective resistances <b>Heat transfer from extended surface:</b> Types of fin, heat flow through rectangular fin, infinitely long fin, fin insulated at the tip and fin losing heat at the tip, efficiency and effectiveness of fin, Biot number, Estimation of error in temperature measurement in a thermometer well

Reference Book

1. Heat and Mass Transfer by R K Rajput, S.Chand Publication

SVM Institute of Technology, Bharuch

Department of Mech. Eng.

Syllabus: Backlog Examination (Even semester 2018-19)

BE –III (6<sup>th</sup> Semester) Theory of Machine

**Name of Faculty:** V.R.Parekh , C.S.Jadav, H.G.Shah

**Subject Code:** 2151902

**Subject Name:** Theory of Machine

Sr. No.	Unit	Topics
1	Unit 1	<b>Friction Devices: Clutches, Brakes and Dynamometers</b> Classification of clutches, torque transmission capacity, considerations for uniform wear and uniform pressure theory, single plate and multi-plate clutch, centrifugal clutch, Energy equation and thermal considerations. Classification of brakes, Braking effect, Analysis of Brakes: Block Brake, Band Brake, Band and Block Brake, Internal expansion shoe brake; Braking analysis of four wheelers. Classification of Dynamometers, Analysis of Dynamometers: Prony brake, Rope brake, Hydraulic, Belt Transmission, Epicyclic-Train and Bevis-Gibson torsion.
2	Unit 2	<b>Introduction to Dynamics:</b> Newton's Laws of Motion, Applied and constraint forces, Free-body diagrams, conditions for equilibrium, Two and Three forces members, Four force members, Friction forces, Static force analysis with friction.

Text Book(s):

- 1) Theory of Machine, R.S.Khurmi, S.Chand Publication
- 2) Theory of Machine, S.S.Ratan, Tata Mcgraw Hill

SVM Institute of Technology, Bharuch  
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 Syllabus: Backlog Examination (Odd sem 2018-19)

BE – III year (5<sup>th</sup> Sem) ME

**Name of Faculty:** Meghna Vaghela, Kalpana Ray, Dhaval Patel.

**Subject Code:** 2151908

**Subject Name:** Control Engineering.

Sr. No.	Unit	Topics
1	Unit 1	<b>Basic concepts of control system:</b> <ul style="list-style-type: none"> <li>• Terminology - plant, process, system, disturbances, controlled variable, manipulated variable etc.,</li> <li>• Block diagram of basic control system, application areas with examples.</li> <li>• Classifications of control systems, Concept of superposition for linear systems with examples.</li> </ul>
2	Unit 2	<b>Mathematical modelling of systems:</b> <ul style="list-style-type: none"> <li>• Translational and rotational mechanical, electrical, thermal, hydraulic and pneumatic systems, Force voltage and force current analogy, Position servo mechanism.</li> <li>• Block diagram and signal flow graph representation of physical systems along with rules, properties, comparison and limitation, Mason's gain formula</li> </ul>
3	Unit 1	<b>Time response analysis:</b> <ul style="list-style-type: none"> <li>• Standard test signals along with examples of their usage,</li> <li>• Steady state errors for step, ramp and parabolic inputs,</li> <li>• Analysis of first and second order systems,</li> <li>• Transient response specifications with numerical examples,</li> <li>• Basic control actions and two position, proportional, PI, PID and rate feedback controllers, Limitations of time domain analysis.</li> </ul>
4	Unit 3	<b>Stability:</b> <ul style="list-style-type: none"> <li>• Concept of stability, types of stability, Routh's stability criterion, special cases with numerical examples, Open loop and closed loop transfer poles,</li> <li>• The Root Locus Method: Root locus Procedure &amp; Problems</li> </ul>

Text Book:

1. Modern control theory, Katsuhiko Ogata, Pearson Education International, Fifth edition.
2. Control system engineering, Norman S Nise, John Wiley & Sons, Inc., Sixth edition
3. Modern control systems, Richard C. Dorf, Robert H Bishop, Pearson Education International, Twelfth edition.
4. Automatic control systems, Farid Golnaraghi, Benjamin C Kuo, John Wiley & Sons, Inc., Ninth edition
5. J.Nagrath and M.Gopal," Control System Engineering", New Age International Publishers, 5th Edition, 2007