

# **SHRI VENKATESHWARA UNIVERSITY**



## **Syllabus**

**M.TECH - PART TIME  
Mechanical Engineering  
II<sup>nd</sup> SEMESTER  
(Three Years Post Graduation Programme)**

**(w.e.f. 2019-20)**

**SCHOOL OF ENGINEERING &  
TECHNOLOGY**



**Course:-** M.Tech

**Subject:-** Operational Management

**Max. Marks: a) Internal/Practical- 30**  
**b) External- 70**

**Year/Semester:-** I/II

**Subject Code:-** WME-201

Credit Hours		
L	T	P
3	0	0

**Course outcomes:** At the end of the course, students will be able to

1. Solve simple problems of Operational Management understanding the basic concepts.
2. Apply numerical methods to solve continuum problems.

### Syllabus Contents:

- **Introduction to Operational Management and Processes:** Management perspective and control approach to management, Basic management functions and managerial skills, Operations Strategy, Process and Technologies, HR in Operations Management, Concept of productivity and its analysis, Quality aspects in Production and Services.
- **Facility planning:** Product and process selection, Facilities locations: Factors influencing selection of locations, Quantitative analysis in facility location: Weight method, Weight cum rating method, Composite measure method, Locational break-even analysis, Median model, Gravity model, Bridgeman's Dimensional analysis. Plant layout: Product layout, Process Layout, G.T based layout.
- **Production planning and control:** Different types of production systems: Mass, Batch, Job, Project and continuous.
- **Forecasting:** Need and importance of Forecasting, Forecasting Techniques: Delphi Method, Simple and Moving average, Exponential Smoothing, Correlation and Regression Analysis, Karl Pearson's Correlation, MAD, Tracking Signal.
- **Planning & Scheduling:** Different types of Planning: Long-term, Aggregate, short-term, Master Production Schedule, Rough cut capacity planning, Detail scheduling, Machine loading and sequencing: Johnson's rule and GANTT chart, Assembly line balancing: Line efficiency, balance delay, smoothing index, Different techniques of balancing,
- **Materials Management:** Concept of inventory and its importance, Types of inventory, Saw – Tooth model, Computation of EOQ: Deterministic and Probabilistic models, Selective inventories. MRP –I and MRP – II, JIT.
- **Supply Chains:** Evolution of Supply chain and its definition, Push pull view of supply chain, Cycle View of supply chain, Supply chain drivers, Factors affecting the supply chain performance, Efficient supply chain and responsive supply chain and its strategic fit, Bullwhip effect of supply chain, Merits and demerits of supply chain.
- **Project Management:** Concept of project and network analysis and network diagram, Computation of project completion time (Forward pass and backward pass), CPM, Computation of float, Difference between PERT and CPM, Probabilistic time estimates, probability of project completion by a target date, Project crashing.
- **Queuing Model:** Waiting line problem and its application, Characteristic of the Queue and the service facilities, Poisson arrival and Exponential service distribution, Traffic intensity, Computation of Waiting time, number of customers in the system, decision problems in queuing.

### References:

- Essentials of Management by Koontz & Wehrich, TMH.
- Modern Production / Operations Management by E.S. Buffa and R.K. Sarin, John Wiley & Sons.
- Quantitative techniques in Management by N. D. Vohra, Tata McGraw Hill.
- Production Planning and Inventory Control by Narasimhan, McLeavey, Billington, PHI.
- Production and Operation Management by Muhlemann, Oakland and Lockyer, Mcmillian India Ltd.
- An Introduction to Management science by Anderson, Sweeny and Williams, Thomson South west.
- Logistic and supply chain management by Martin Chirstopher, Pearson Education.
- Supply Chain Management by Chopra and Meindl, Pearson Education, 3rd Ed.,. 2007

**Course:-** M.Tech

**Subject:-** Hydraulics & Pneumatics

**Max. Marks: a) Internal/Practical- 30**

**b) External- 70**

**Year/Semester:-** I/II

**Subject Code:-** WME-021

Credit Hours		
L	T	P
3	0	0

**Course Outcomes:** At the end of the course, students will be able to

1. Solve ordinary and partial differential equations in structural mechanics using numerical methods.
2. Write a program to solve a mathematical problem.

### **Syllabus Contents:**

- **Introduction:** Power hydraulics & its applications, Hydraulic symbols,
- **Positive displacement Pumps:** Gear, Vane, Piston and other special types of pumps.
- **Control valves:** Pressure Control: relief valve, Unloader valve, Pressure reducing valve, Counter balance valve, sequence valve, Flow Control: Meter in Meter out, Bleed off, Pressure and Temperature compensated flow control valve, Direction Control: Check valve, 2/3 position, 3/4 position, Open centre, closed centre, Tandem centre and others, Cartridge valves, Flow forces on valve spools and valve design.
- **Hydraulic actuators:** Linear (S/T, D/T, Cushion) and rotary, Design of Hydraulic actuators, Accessories in hydraulic systems: Accumulator, Air-breathe valve, Pressure switches etc. Hydraulic power packs.
- **Servo valves:** Torque motor, electro-hydraulic Servo valves: Types and principles of operations
- **Design of Hydraulic circuits and its application:** Regeneration, Pre-fill, Twin Pump and others.
- **Maintenance of hydraulic systems and working fluid:**
- **Pneumatics:** Air Filter, Lubricators and Regulators, Pneumatic control elements: Air Cylinders and their Design, Pneumatic safety circuits, Pneumatic Logic control.

### **Reference Books:**

1. Hydraulic Control Systems by H.E. Merritt, Wiley New York.
2. Fluid Power by Esposito, Pearson Education
3. Hydraulics and Pneumatics by Andrew Parr, Jaico Publishers.

**Course:-** M.Tech

**Subject:-** CAD/CAM Lab

**Max. Marks:** a) **Internal/Practical-** 25  
b) **External-** 25

**Year/Semester:-** I/II  
**Subject Code:-** WME-211

Credit Hours		
L	T	P
0	0	4

**Course Outcomes:** At the end of the course, students will be able to

1. Apply/develop solutions or to do research in the areas of Design and simulation in Mechanical Engineering.
2. Have abilities and capabilities in developing and applying computer software and hardware to mechanical design and manufacturing fields.
3. Review and document the knowledge developed by scholarly predecessors and critically assess the relevant technological issues.
4. Formulate relevant research problems; conduct experimental and/or analytical study and analyzing results with modern mathematical / scientific methods and use of software tools.
5. Design and validate technological solutions to defined problems and communicate clearly and effectively for the practical application of their work.

### **List of Experiments/Assignments:**

#### **CAD LAB**

1. Initiating the Graphics Package; Setting the paper size, space; setting the limits, units; use of snap and grid commands.
2. Drawing of primitives (Line, arc, circle, ellipse, triangle etc.)
3. Drawing a flange.
4. Drawing a bushing assembly.
5. Dimensioning the drawing and adding text.
6. Setting the layers and application of layers.
7. Isometric and Orthographic projections.
8. Viewing in three dimensions.
9. Removal of hidden lines – Shading and Rendering.

#### **CAM LAB**

1. Part programming preparation through AutoCAD.
2. Part programming preparation through AutoCAD.
3. APT part programming for 2D – contour.
4. Machining of one job on CNC Machine Tool

**Course:-** M.Tech

**Subject:-** Disaster Management

**Max. Marks: a) Internal/Practical- 30**

**b) External- 70**

**Year/Semester:-** I/II

**Subject Code:-** AUD-102

Credit Hours		
L	T	P
3	0	0

**Course Outcomes:** Students will be able to:

1. Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
2. Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
4. Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in

## **Syllabus Contents:**

### **Unit 1: Introduction**

Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.

### **Unit 2: Repercussions Of Disasters And Hazards:**

Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem.

Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

### **Unit 3: Disaster Prone Areas In India**

Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics

### **Unit 4: Disaster Preparedness And Management**

Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.

### **Unit 5: Risk Assessment**

Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.

### **Unit 6: Disaster Mitigation**

Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.

## **SUGGESTED READINGS:**

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies" "New Royal book Company.
2. Sahni, Pardeep Et. Al. (Eds.), "Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.
3. Goel S. L. , "Disaster Administration And Management Text And Case Studies" , Deep & Deep Publication Pvt. Ltd., New Delhi.