

## FOURTH YEAR

Course Title: Operations Research:

- Understand different definitions, concepts and principles of OR. • Check the optimality of the solution for different OR techniques by using different methods
- Solve LPP, transportation problem, assignment problem, sequencing problems, Queuing theory, theory of games, replacement problems and dynamic programming problem.
- Write algorithm for transportation problem, assignment problem, sequencing problem, LPP and DPP.

Course Title: Computer Aided Design and Computer Aided Manufacturing:

- Learn the fundamental knowledge of CAD/CAM
- Design the parts/ products using CAD systems
- Acquire knowledge on NC part programming.
- Prepare the part/product codes using Group Technology
- Understand the layout of flexible manufacturing systems and apply the automated inspection methods.

Course Title: Power Plant Engineering:

- Understand the sources of energy including Steam, Diesel, Solar, Wind and geothermal along their layouts and working principles
- Acquire knowledge of combustion process
- Explain the working of hydroelectric and nuclear power plant and its components.
- Understand the concepts of Economics of power Generation to solve realistic problems.

Course Title: Instrumentation & Control Systems:

- Understand the basic principles, characteristics, errors, limitations of measurement and its systems
- Acquire the knowledge on the working principle, construction, calibration and its applications for various transducers.
- Measure the values of displacement, temperature, pressure, level, flow, acceleration, speed, vibration, stress, strain and humidity.
- Recognize the application of FMS, CAQC, CIM.

Course Title: Unconventional Machining Process:

- Understand the need and importance of non-traditional machining
- Know the basics principle, equipment, process variables and mechanics of metal removal in abrasive jet machining and water jet machining
- To study the fundamentals of tool design, surface finishing and metal removal rate of electro chemical grinding, electro chemical machining and electro chemical honing
- To understand principle of operation, types of electrodes and process parameters and machine tool selection in EDM and electric discharge grinding and wire cut process.
- To know the basics of EBM and comparison of thermal and non-thermal processes.
- Study the various process parameters and application of plasma in manufacturing industries

Course Title: Industrial Management:

- Understand management principles and theories.

- Understand different types of organisation.
- Design plant layout and product design
- Analyse by using work study methods
- Evaluate process by using different methods

Course Title: Robotics:

- Describe the automation and brief history of robot and robot terminology.
- Analyse the manipulator design including actuator, drive, sensor issues and robot motions.
- Evaluate the coordinate system, kinematics, dynamics and Jacobin for robot
- Explain Selection of robots for various applications in manufacture.

Course Title: Plant Layout and Material Handling:

- Understand various techniques and tools of layout planning, Engineering practice.
- Apply the concepts for effectively running an organization.
- Apply the concepts in integration of material handling systems. • Design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Understand the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- Recognize the need for, and an ability to engage in life-long learning.

Course Title: Production Planning and Control:

- Understand the objectives, functions, elements, types of production planning and control.
- Analyse the importance of techniques, functions of forecasting and inventory management systems for proper utilisation of 3-M.
- Acquire knowledge on routing, scheduling and dispatching techniques
- Illustrate the application of computers in PPC.

Course Title: Renewable Energy Sources:

- Demonstrate various non-conventional sources of energy like wind, geothermal energy etc.
- Acquire the knowledge of modern energy conversion technologies.
- Understand the working of various direct energy conversion systems and their applications.
- Describe solar radiation and energy collection.