

COURSE OUTCOMES
Seventh Semester B. TECH

B. Tech. 7 th Semester Elective – III: Mechatronics (BTME701T) Syllabus (Theory)
Course Outcomes

After successful completion of this course the student will be able to:

- CO1 Identify scope and elements of mechatronics design process and types of control system
- CO2 Study various actuating systems of mechatronic applications
- CO3 Identify system interfacing requirements and data acquisition using signal conditioning and signal processing techniques
- CO4 Study digital logic for development of microprocessor
- CO5 Development of ladder diagram and programming using PLC for interfacing between hardware and software..

B.Tech. 7 th Semester Elective – III: Mechatronics (BTME701P) Syllabus
(Practical)
Course Outcomes

After successful completion of this course the student will be able to:

- CO1 Identify and explain various solid state electronic devices, sensors and actuators.
- CO2 Describe and demonstrate the conversion of signal from Analog to digital and vice versa.
- CO3 Implement ladder logic programming using PLC to develop various mechatronics applications
- CO4 Interpret and demonstrate various electro-pneumatic and electro-hydraulic systems using graphical symbols and circuit diagram.
- CO5 Identify and explain various solid state electronic devices, sensors and actuators.

B.Tech. 7 th Semester Elective – III: Computer Aided Design (BTME701T)
Syllabus (Theory)
Course Outcomes

After successful completion of this course the student will be able to:

- CO1-To design graphic system by selecting appropriate input output devices for any graphical applications. Also, develop a logic for various geometrical entities used in modeling software by giving appropriate mathematical treatment, put it into an algorithm and convert an algorithm into a computer program.
- CO2-To develop a logic for various transformations on any 2D & 3D geometric objects giving appropriate mathematical treatment, put it into an algorithm and convert an algorithm into a computer program
- CO3-To Explain the different geometric modeling techniques, synthetic curves & methods of assembly modeling. Also understand parametric representation of space curves and surfaces.
- CO4- To understand numerical analysis technique called finite element method and apply it on one dimensional problem to determine various field variances.

CO5- Apply finite element method on truss and beams to determine various fields variances such as nodal displacement, reaction force, element stress etc.

Elective – III: Computer Aided Design (BTME701P) Syllabus (Practical) **Course Outcomes**

After successful completion of this course the student will be able to:

CO1 Write logic in the form of an algorithm to construct geometric entities and generate a computer program for the same.

CO2 Develop finite element model of an engineering problem, apply loading conditions and boundary conditions, and solve it for analysis of its performance in simulated condition using Analysis software

CO3 Write computer program for 2D and 3D Transformation on any object.

CO4 Generate 2-D and 3-D geometric model of Engineering object using construction and modifying commands using CAD software.

B.Tech. 7 th Semester Elective – III: Advancements in Automobile Engineering (BTME701T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Classify and identify the main components of automobile. Explain the construction and working of I. C.Engine, fuel supply systems, cooling systems and lubrication systems used in automobile.

CO2 Illustrate the functions of different types of automobile clutches and gear boxes and their applications.Explain the working of transmission system, its components such as propeller shaft, drives,differential and axles.

CO3 Describe the working of different steering systems, steering gear boxes and suspension systems. Identify the different components of steering, suspension and brake systems with their comparisons and applications.

CO4 Demonstrate the importance of safety considerations in automobiles and outline the recent technological development in automotive safety. Describe the automobile maintenance, Trouble shooting, service procedures, Overhauling and Engine tune up.

CO5 Explain the working of Electric Car, Hybrid Electric vehicles and Fuel cell vehicles. Describe the importance of Alternative energy sources,Vehicle Pollution norms and different methods of pollution control

Elective – III: Advancements in Automobile Engineering Lab (BTME701P) **Syllabus (Practical)**

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Make students understand the basic concepts, requirement and working of various components of automobile.

CO2 Make students understand the assembling and disassembling procedure of Engine.clutch,brakes and the process of wheel alignment, balancing and battery testing.

CO3 Enable students to understand and identify components of transmission system, brakes, steering and suspension systems.

CO4 Aware students about automotive electronics and recent technologies used in automobiles.

CO5 Aware students about the importance of safety considerations in automobiles, automobile maintenance and overhauling.

Elective – III: Computational Fluid Dynamics (BTME701T) Syllabus (Theory) **Course Outcomes**

After successful completion of this course the student will be able to:

CO1 Interpret the governing equations of the fluid flow, heat transfer & their applications.

CO2 Choose methods and analysis techniques used in computational solutions of fluid mechanics and heat transfer problems.

CO3 Explain the interaction of physical processes and numerical techniques.

CO4 Develop mathematical model and write algorithms for the different fluid flow and heat transfer problems.

CO5 Apply Finite differences and finite volume techniques.

Elective – III: Computational Fluid Dynamics Lab (BTME701P) Syllabus (Practical)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Explain the fundamentals of fluid flow and thermal simulations.

CO2 Select different boundary conditions, mesh generation techniques to simulate fluid flow and thermal problem.

CO3 Solve fluid flow and thermal analysis problems using commercial software package for different geometry and configurations.

CO4 To analyze the results obtained using postprocessing to make meaningful inferences.

Energy Conversion III (BTME702T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Students will be able to analyze the gas turbine and jet propulsion system on varied operating conditions.

CO2 Students will be able to recognize the hydraulic pumps and valves and can able to logically design the hydraulic circuit.

CO3 Students will be able to recognize the air compressors and pneumatic control valves and can able to logically design the pneumatic circuit.

CO4 Students will be able to understand solar power and future opportunities in solar power systems.

CO5 Students will learn the basics of various non-conventional energy sources and their applications.

Open Elective – II: Introduction to Electric Vehicles (BTME703T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Explain the basics of electric vehicles, their architecture, technologies and fundamentals

CO2 Interpret the working of different electrical equipment in electric vehicles

CO3 Explain the use of different energy storage systems used electric vehicles, their control techniques.

CO4 Understand the control and configurations of EV charging stations and know how of various energy management strategies

CO5 Outline the policies and regulations for electric vehicles in global and Indian scenario

Open Elective – II: Waste management (BTME703T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Understand different aspects of solid waste, its sources and effects on man and material etc.

CO2 Understand problems arriving in handling large amount of solid waste generated ,its collection and transportation, processing and will able able to design safe collection and disposal methods

CO3 Design methods and equipments for solid waste management to reduce its impact on environment.

CO4 Evaluate and Analyze hazardous waste.

CO5 Design the appropriate disposal systems for hazardous wastes management.

Open Elective – II: Finance and Cost Management (BTME703T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 apply the knowledge of basics of Financial Management concepts and Time Value of Money

CO2 select, classify, analyze and plan the sources of finance, types of capital, various elements of costs, cost control and evaluate equipment replacement policy, make or buy decisions.

CO3 develop and interpret books of Accounts, Trial Balance, balance Sheet, P&L account, cash flow statement in business

CO4 evaluate and examine various Cost of Capital, opportunity cost of capital, Cost of different sources of finance

CO5 evaluate, select and determine various techniques of capital budgeting, profitability index.

Open Elective – II: Industrial Robotics (BTME703T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Understand history and classification of robots

CO2 To know about robot end effectors and grippers

CO3 Understand direct and inverse kinematics

CO4 Understand the types of robot sensors and its applications

CO5 To know the cell layouts of robots and its interface

Open Elective – II: Introduction to Renewable Energy Resources (BEME703T)

Syllabus (Theory)

Course Outcomes

At the end of the course students will be able to

CO1 Recognize the need of renewable energy sources.

CO2 Understand various solar thermal energy conversion systems and solar photovoltaic systems in detail.

CO3 Describe different biogas plants, bio-diesel production method and potential of hydrogen as a fuel.

CO4 Explain the working principle of Wind energy systems and ocean thermal energy conversion systems

CO5 Describe the working of Fuel cell system, Geothermal & Magneto hydro dynamic (MHD) power generation systems and Understand the principles of energy conservation.

Design of Transmission Systems (BTME704T) Syllabus (Theory)

Course Outcomes

After successful completion of this course the student will be able to:

CO1 Design journal and thrust bearings and selection of standard rolling contact bearings.

CO2 Design flexible transmission drives like belts, chains and rope

CO3 Design the positive transmission drives like gears as spur and Helical Gear.

CO4 Design the positive transmission drives like gears as worm and Bevel Gears

CO5 Design the energy storing components like Flywheels for various applications.

Summer Internship (BTME705P)

Course Outcomes

Summer Internship should be undertaken after end of 6th Semester for a minimum duration of 4 weeks in Industry/ Research Institute/ Organizations & its Evaluation to be done in 7th semester.

After successful completion of this course the student will be able to think, design, innovate about new technologies, problem identification methods & techniques used in real time world in industry.

Employability Enhancement (BTME707P)

Course Outcomes

Students will learn training on

1. Technical aptitude

2. General aptitude

3. Group Discussion

4. Interview Techniques

To enhance their chances of employment.

Students should be given training on Technical aptitude, General aptitude, Group Discussion, Interview Techniques to enhance their chances of employment.