

Department of Mechanical Engineering

Course Outcomes

MSBTE prescribed syllabus, as per the Scheme 'G'

Semester – I

Abbreviation	Subject	Code
ENG –	English	(17101)
	<ol style="list-style-type: none">1) Understand English - the language as a medium of expressing oneself and being global language, use it in all spheres of life – Personal, Professional and Social.2) Developing the vocabulary.3) Learn and apply rules of grammar.4) Comprehend the given unseen paragraph.	
EPH –	Basic Physics	(17102)
	<ol style="list-style-type: none">1) Understand the method of selection of material for intended purpose.2) Application of knowledge of heat conductors (good and bad conductors of heat) in various engineering concepts.3) Understand the effect of interference between the waves of light.4) Application of knowledge of wave motion and resonance in various engineering applications.5) Application of concept photoelectric effect for application like Photoelectric cell and Solar cell.	
ECH –	Basic Chemistry	(17103)
	<ol style="list-style-type: none">1) Understand the concept of valence electron and valency of elements.2) Application of knowledge of electrolysis in engineering applications.3) Understand the formation process/reactions of various molecules.4) Application of the properties of metals and alloys in engineering field.5) Understand the use of non-metallic material in engineering field.	
BMS –	Basic Mathematics	(17104)
	<ol style="list-style-type: none">1) Apply the Cramer's rule and Matrix method to solve simultaneous equations in three variables.2) Use concept of allied angle, compound angle, multiple and sub-multiple angles to solve engineering problems.3) Use factorization and de-factorization formulae to solve examples.4) Understand the relationship of two variables.	

EGG – Engineering Graphics (17001)

- 1) Draw different engineering curves and know their applications.
- 2) Draw orthographic projections of different objects.
- 3) Visualize three dimensional objects and draw Isometric Projections.
- 4) Draw simple geometrical figures using CAD package.

CMF – Computer Fundamentals (17002)

- 1) Use of Operating System.
- 2) Use MS-Word, MS-Excel, MS-Power Point, effectively for documentation.
- 3) Use browser for accessing the Internet
- 4) Handle Personal Computer System

WPI – Basic Workshop Practice (17007)

- 1) Know basic workshop processes.
- 2) Read and interpret job drawing, plan various operations and make assembly.
- 3) Identify and select the proper material for the job undertaken.
- 4) Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- 5) Operate, control different machines and equipment in respective shops.
- 6) Inspect the job for specified dimensions

Semester – II

Abbreviation Subject Code

CMS – Communication Skills (17201)

- 1) Utilize the skills necessary to be a competent communicator.
- 2) Select and apply the appropriate methods of communication in various situations.

APH – Applied Physics (17202)

- 1) Understand laws and principles of electrical circuits.
- 2) Classify solids on the basis of semiconductor band theory.
- 3) Understand principles of Laser and its applications in engineering fields.
- 4) Identify superconductor and its types.
- 5) Understands applications of nanoparticles in engineering field.

ACH – Applied Chemistry (17203)

- 1) Select proper type of cell based on the requirement in electronics and computer engineering.
- 2) Apply knowledge of extraction, properties of copper and aluminium in engineering applications.
- 3) Know various insulating or dielectric materials used in for electronic equipments and computers.
- 4) Generalize different factors which affect atmospheric as well as electrochemical corrosion.

EGM Engineering Mechanics (17204)

- 1) Understand the effect of different types of coplanar forces.
- 2) Apply Principles of equilibrium in finding reactions of different types of beams.
- 3) Apply principles of equilibrium for locating centroid and centre of gravity for given solids.
- 4) Understand working of different types of machines

EDG Engineering Drawing (17205)

- 1) Understand the basic concepts of projection of different entities.
- 2) Visualize and draw views of objects in different positions.
- 3) Develop lateral surfaces of different solids.
- 4) Prepare proportionate free hand sketches of basic machine elements.

EMS - Engineering Mathematics (17216)

- 1) Use complex numbers for representing different circuit component in complex form to determine performance of electrical circuit and machines.
- 2) Apply rules and methods of differential calculus to solve problems.
- 3) Apply various numerical methods to solve algebraic and simultaneous equations.

DLS - Development of Life Skills (17010)

- 1) Understand and appreciate importance of life skills.
- 2) Use self-analysis and apply techniques to develop personality.
- 3) Use different search techniques for gathering information and working effectively.
- 4) Improve the presentation skills.

WPC- Workshop Practice (17011)

- 1) Know basic workshop processes.
- 2) Read and interpret job drawing, plan various operations and make assembly.
- 3) Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- 4) Operate, control different machines and equipment in respective shops.
- 5) Produce and Inspect the job for specified dimensions
- 6) Adopt safety practices while working on various machines.
- 7) Know basic workshop processes.
- 8) Produce jobs as per specified dimensions.

Semester – III

AMS Applied Mathematics (17301)

- 1) Apply derivatives to find slope, maxima, minima and radius of curvature.
- 2) Apply integral calculus to solve different engineering problems.
- 3) Apply the concept of integration for finding area.
- 4) Apply differential equation for solving problems in different engineering fields.
- 5) Apply the knowledge of probability to solve the examples related to the production process.

BEM Basic Electronics & Mechatronics (17302)

- 1) Identify and test different electronic components.
- 2) Use principles of circuit operations and its applications.
- 3) Distinguish various elements in analogue and digital electronics.
- 4) Understand applications of electronics in mechanical field for measurement and control.
- 5) Understand working of different types of transducers and their applications.
- 6) Understand concept of mechatronics and PLC.

MEM Mechanical Engineering Materials (17303)

- 1) Understands about basics of engineering materials as regards classification, structure and properties.
- 2) Understand basics of structure - property relationships of heat treatments.
- 4) Analyze various types of steels and cast irons along with their specifications.
- 5) Understand about types , composition and field of application of various non ferrous metals and alloys & non metallic materials
- 6) Understand about types, composition and field of application of various Non metallic materials.
- 7) Understand about basic process of powder metallurgy and applications.
- 8) Understand about various Non-destructive testing methods and their applications.

SOM Strength of Materials (17304)

- 1) Understand the fundamentals of solid mechanics.
- 2) Acquire elementary knowledge of stresses, strains & material properties.
- 3) Understand & analyze the basic principles involved in the behavior of machine parts under load in the context of designing it.
- 4) Understand & analyze the mechanical properties of the various materials.

MED Mechanical Engineering Drawing (17305)

- 1) Interpret simple industrial drawings.
- 2) Interpret instructions related to manufacturing of components.
- 3) Use IS convention of representing various machine components.
- 4) Appreciate the significance & use of tolerances of size, forms & positions

CAD **Computer Aided Drafting** **(17016)**

- 1) Draw, edit and modify 2D drawings.
- 2) Give dimensions, tolerances and geometrical tolerances.
- 3) Draw Isometric drawing and 3 D drawing.
- 4) Plot a drawing.

PPO - **Professional Practices - I** **(17017)**

- 1) Acquire information from different sources – the books, the internet and the magazines etc.
- 2) Prepare notes for given topic.
- 3) Present given topic in a Seminar.
- 4) Interact with peers to share thoughts and information.
- 5) Prepare a report on Industrial Visits and Expert's Lecture.

Semester - IV

Abbreviation **Subject** **Code**
EST - **Environmental Studies** **(17401)**

- 1) Understand the importance of environment.
- 2) Know key issues about environment.
- 3) Understand the reasons for environment degradation.
- 4) Know aspects about improvement methods.
- 5) Know initiatives taken by the world bodies to restrict and reduce degradation.

PR **Manufacturing Processes** **(17402)**

- 1) Use the basic machine tools like lathe and drilling.
- 2) Produce and inspect the job as per specified dimensions.
- 3) Select the specific manufacturing processes for the desired output.
- 4) Adopt safety practices while working on various machines.
- 5) Explain the different types of plastic molding processes.
- 6) Select the basic manufacturing process for different components to be machined.

EEN **Electrical Engineering** **(17404)**

- 1) Differentiate between a.c. and d.c. supply.
- 2) Identify different type's motors, transformers and drives.
- 3) Select suitable drive as per the requirements.
- 4) Understand various types of electric heating and welding operations in manufacturing processes.
- 5) Supervise routine maintenance of electrical machines and supply systems.
- 6) Use the tariff system.
- 7) Calculate energy requirements and cost of energy.

TEN Thermal Engineering (17410)

- 1) Define fundamental concepts of thermodynamics to thermodynamic systems.
- 2) Use various laws of thermodynamics.
- 3) Apply various gas laws and ideal gas processes to various thermodynamic systems.
- 4) Draw the construction and explain working of boilers, turbines & condensers.
- 5) Find properties of two phase system from steam table / mollier charts
- 6) State the various modes of heat transfer

FMM Fluid Mechanics & Machinery (17411)

- 1) Define various properties of fluids
- 2) Measure pressure, velocity and flow rate using various instruments.
- 3) State continuity equation, Bernoulli's equation and its applications.
- 4) Estimate various losses in flow through pipes.
- 5) Explain concept of impact of jet on various types of vanes.
- 6) Draw the construction, working of hydraulic pumps and turbines.
- 7) Evaluate performance of turbines and pumps.

TOM Theory of Machines (17412)

- 1] Understand different machine elements and mechanisms.
- 2] Understand Kinematics and Dynamics of different machines and mechanisms.
- 3] Draw cam profile suitable to various displacement diagrams.
- 4] Select Suitable Drives and Mechanisms for a particular application
- 5] Understand the function, operation and application of flywheel and governor.
- 6] Understand the function, operation and application of brake, dynamometer, clutch and bearing
- 7] Find magnitude and plane of unbalanced forces.

PPT - Professional Practices - II (17035)

- 1) Acquire the knowledge from different resources.
- 2) Present a given topic effectively in a seminar and build a stage-daring.
- 3) Interact with colleague through group discussion.

Semester - V

AEN Automobile Engineering (17526)

- 1) Know about Automobile market in India.
- 2) Know the vehicles performance parameters.
- 3) Understand the detailed construction features of automobile engines.
- 4) Dismantle and assemble the automobile engines and vehicle systems.
- 5) Know various advanced features in modern automobile vehicles.
- 6) Understand and identify various system components with their functions.
- 7) Compare and select the automobile vehicles based on their features.

AMP **Advanced Manufacturing Processes** **(17527)**

- 1) Know different Non-traditional machining processes.
- 2) Understand the working of Broaching Machine, Milling Machine, Gear Cutting machines, Grinding Machines, Surface finishing machines.
- 3) Work as a maintenance engineer.
- 4) Know the Operation and control of different CNC machine tools.
- 5) Produce jobs as per specified requirements by selecting the specific machining process.
- 6) Adopt safety practices while working on various machines.
- 7) Develop the mindset for modern trends in manufacturing and automation.

MAC **Measurement & Control** **(17528)**

- 1] Understand the principle of operation of an instrument.
- 2] Appreciate the concept of calibration of an instrument.
- 3] Select Suitable measuring device for a particular application.
- 4] Identify different types of errors.

PEN **Power Engineering** **(17529)**

- 1) Describe construction and working of I. C. Engines.
- 2) Calculate various performance parameters by conducting trial on I. C. Engines.
- 3) Explain working and applications of gas turbines.
- 4) Explain different types of air compressors and conduct trial on air Compressor.
- 5) Describe construction, working and application of vapor compression cycle.
- 6) Appreciate psychometric processes and air conditioning systems.

MQC **Metrology and Quality Control** **(17530)**

- 1) Understand and calculate the least count of all basic measuring instruments.
- 2) Select and use appropriate instrument/s for specific measurement.
- 3) Understand the systems of limits, fits and tolerances and correlate with machine drawing and manufacturing processes.
- 4) Analyze and interpret the data obtained from the different measurements processes and present it in the graphical form, statistical form for understanding the concepts of SQC.
- 5) Construct, draw and interpret the control charts

CNC **CNC Machines** **(17064)**

- 1) Know different types of CNC machines,
- 2) Understand the different codes used in CNC programming.
- 3) Know the Operation and control of different CNC machine and equipments.
- 4) Adopt different tooling while working on various CNC machines.

PPT – Professional Practices – III (17065)

- 1) Acquire Information & Knowledge from different resources
- 2) Write the reports Industry Visits & Guest Lectures.
- 3) Deliver Seminars on a given topic which will help them to build self-confidence & Knowledge.
- 4) Interact with each other through group discussion.
- 5) Present the feedback of various activities.

BSC Behavioural Science (17075)

- 1) Develop him/her as Team leader.
- 2) Use self-motivation and motivate others.
- 3) Build a team and develop team spirit among the team members.
- 4) Improve the interpersonal relationship skills.
- 5) Learn Problem solving and decision making skills.
- 6) Discuss a particular topic in a group and face the interview

Semester – VI

Abbreviation Subject Code
MAN – Management (17601)

- 1) Get familiarized with environment related to business processes.
- 2) Know the management aspects of the organisations.
- 3) Understand Role & Responsibilities of a Diploma engineer.
- 4) Understand importance of quality improvement techniques.
- 5) Appreciate need and importance of safety in industries.
- 6) Understand process of Industrial finance and its management.
- 7) Know the latest trends in industrial management.

IFP Industrial Fluid Power (17608)

- 1) Identify various components of hydraulic & pneumatic systems.
- 2) Know the working principle of various components used in hydraulic & pneumatic systems.
- 3) Select appropriate components required for simple hydraulic and pneumatic circuits.
- 4) List the probable causes of faults or defects in the hydraulic & pneumatic circuits.

PER Production Engineering & Robotics (17609)

- 1) Understand importance of productivity and factors for improvement of productivity.
- 2) Know different production systems and modern trends in manufacturing systems.
- 3) Apply modern tools in production engineering like six sigma, kaizen, Poka yoke, etc.
- 4) Understand concept of robotics, limitations of human in difficult operation and applications of robots

DME **Design of Machine Elements** **(17610)**

- 1] Analyze the various modes of failure of machine components under different load patterns.
- 2] Design and prepare part and assembly drawings.
- 3] Use design data books and different codes of design.
- 4] Select standard components with their specifications from manufacturer's catalogue.
- 5] Develop drawings on CAD software.

Elective I **Renewable Energy Sources & Management** **(17611)**

- 1) Appreciate the need and importance of renewable energy
- 2) Analyze various Biomass Conversion processes.
- 3) Judge the Energy Saving Potential, Waste Heat Recovery, Energy Efficiency.
- 4) Understand the methodologies to execute preliminary energy audit

Elective II **Refrigeration & Air Conditioning** **(17612)**

- 1) Compare various types Refrigeration cycles
- 2) List various properties of different refrigerants and appreciate applications of Refrigerants with their ill effects on environment.
- 3) Identify various compartment & controls used in Refrigeration & Air Conditioning practice.
- 4) Able to assemble, dismantle the components of refrigeration systems along with trouble shoot the refrigeration systems

SMO **Solid Modelling** **(17063)**

- 1) Use appropriate commands
- 2) Develop solid models from 2 D drawing.
- 3) Use of printers / plotters.

IPR **Project** **(17090)**

- 1) Analyze the given problem.
- 2) Generate alternative solutions to the problem.
- 3) Compare & select feasible solutions amongst alternative generated.
- 4) Develop and manufacture new/modified equipments.
- 5) Acquire technical knowledge beyond curriculum

EDU **Entrepreneurship Development** **(17099)**

- 1) Appreciate the concept of Entrepreneurship
- 2) Identify entrepreneurship opportunity.
- 3) Develop entrepreneurial values and attitude.
- 4) Collect and use the information to prepare project report for business venture.
- 5) Develop awareness about enterprise management