

## Course Outcomes (I Scheme)

### 1<sup>st</sup> Semester

#### Course Name: C101 English

<i>C101.1</i>	Formulate grammatically correct sentences.
<i>C101.2</i>	Summarize comprehension of passages
<i>C101.3</i>	Formulate different types of dialogues.
<i>C101.4</i>	Use relevant vocabulary to compose paragraphs to express ideas, thoughts and emotions.
<i>C101.5</i>	Use relevant words in writing and delivering short and long speeches.

#### Course Name: C102 Basic Science

<i>C102.1</i>	Estimate errors in measurement of physical quantities.
<i>C102.2</i>	Apply the principles of electricity and magnetism to solve engineering problems.
<i>C102.3</i>	Use the basic principles of heat and optics in related engineering applications.
<i>C102.4</i>	Apply the catalysis process in industries.
<i>C102.5</i>	Use corrosion preventive measures in industry.
<i>C102.6</i>	Use relevant engineering materials in industry.

#### Course Name: C103 Basic Mathematics

<i>C103.1</i>	Apply the concept of algebra to solve engineering related problems.
<i>C103.2</i>	Utilize basic concept of trigonometry to solve elementary engineering problems.
<i>C103.3</i>	Solve basic engineering problems under given conditions of straight lines.
<i>C103.4</i>	Solve the problems based on measurements of regular closed figure and regular solids.
<i>C103.5</i>	Use basic concepts of statistics to solve engineering related problems.

#### Course Name: C104 Fundamental of ICT

<i>C104.1</i>	Use the computer system and its peripherals.
<i>C104.2</i>	Prepare business document using word processing tool.
<i>C104.3</i>	Interpret data and represent it graphically using spread sheet.
<i>C104.4</i>	Prepare professional presentation.
<i>C104.5</i>	Use different types of web browsers.

**Course Name: C105 Engineering Graphics**

<i>C105.1</i>	Student can draw geometrical figures and engineering curves
<i>C105.2</i>	Student can draw the views of given object using principles of orthographic projection
<i>C105.3</i>	Student can draw isometric views of given component or from orthographic projections
<i>C105.4</i>	Student can use drawing codes, conventions and symbols as per IS SP-46 in engineering drawing.
<i>C105.5</i>	Draw free hand sketches of engineering elements.

**Course Name: C106 Workshop Practices**

<i>C106.1</i>	Select tools and machinery according to jobs
<i>C106.2</i>	Use hand tools in different shops for performing different operations.
<i>C106.3</i>	Operate equipment and machines in different shops.
<i>C106.4</i>	Prepare job according to drawing.
<i>C106.5</i>	Maintain workshop related tools, instrument and machine.

## 2<sup>nd</sup> Semester

### Course Name: C201 Applied Science

<i>C201.1</i>	Select relevant material in industry by analyzing its physical properties.
<i>C201.2</i>	Apply laws of motion in various application
<i>C201.3</i>	Use LASER's, X-ray and photoelectric sensors.
<i>C201.4</i>	Select the relevant metallurgical process related to industrial application.
<i>C201.5</i>	Select relevant water treatment process to solve industrial problem.
<i>C104.6</i>	Use relevant fuel in relevant application.

### Course Name: C202 Applied Mechanics

<i>C202.1</i>	Identify the force system for given condition by applying the basics of mechanics.
<i>C202.2</i>	Select relevant simple lifting machine for given purpose.
<i>C202.3</i>	Determine unknown force of different engineering systems.
<i>C202.4</i>	Check the stability of various force system.
<i>C202.5</i>	Apply the principles of friction in various condition for useful purpose
<i>C202.6</i>	Find the centroid and centre of gravity of various components in engineering system.

### Course Name: C203 Applied Mathematics

<i>C203.1</i>	Calculate the equation of tangent, maxima, minima, radius of curvature by differentiation.
<i>C203.2</i>	Solve the given problems of integration by suitable method.
<i>C203.3</i>	Apply the concept of integration to find the area and volume
<i>C203.4</i>	Solve the differentiation equation for first order and first degree using suitable methods.
<i>C203.5</i>	Utilize basic concepts of probability distribution to solve elementary engineering problems.

### Course Name: C204 Engineering Drawing

<i>C204.1</i>	Draw projection of 2D and 3D standard regular entities.
<i>C204.2</i>	Draw sectional views of objects.
<i>C204.3</i>	Draw orthographic sectional views of objects.
<i>C204.4</i>	Draw missing and auxiliary views of objects.
<i>C204.5</i>	Use various drawing codes, convention and symbols as per IS SP-46
<i>C204.6</i>	Draw free hand sketches of given engineering elements.

**Course Name: C205 Business Communication Using Computer**

<i>C205.1</i>	Communicate effectively by avoiding barriers in various formal and informal situations
<i>C205.2</i>	Communicate skillfully using non-verbal method of communication
<i>C205.3</i>	Give presentations by audio visual aids.
<i>C205.4</i>	Write reports using correct guidelines
<i>C205.5</i>	Compose emails and formal business letters.

**Course Name: C206 Mechanical Engineering Workshop**

<i>C206.1</i>	Select tools and machinery according to jobs
<i>C206.2</i>	Use hand tools in different shops for performing different operations.
<i>C206.3</i>	Operate equipment and machines in various shops.
<i>C206.4</i>	Prepare composite/utility jobs according drawing.
<i>C206.5</i>	Maintain workshop related tools, instrument and machine.

### 3<sup>rd</sup> Semester

#### Course Name: C301 Strength of Materials

<i>C301.1</i>	Compute moment of inertia of symmetric and asymmetric structural section
<i>C301.2</i>	Estimate simple stresses in machine components.
<i>C301.3</i>	Perform test to evaluate mechanical properties according to India standards
<i>C301.4</i>	Compute shear force and bending moment and corresponding shear and bending stresses in beam subjected to point and uniformly distributed load
<i>C301.5</i>	Estimate stresses in shaft under twisting moment
<i>C301.6</i>	Estimate stresses in short member subjected eccentric loading

#### Course Name: C302 Basic Electrical & Electronics Engineering

<i>C302.1</i>	Use principal of electric and magnetic circuits to solve engineering problem
<i>C302.2</i>	Determine voltage and current in A.C Circuits
<i>C302.3</i>	Connect transformers and electric motors for specific requirements
<i>C302.4</i>	Identify electronic components in electric circuits
<i>C302.5</i>	Use relevant electronic components safely
<i>C302.6</i>	Use relevant electric/electronic protective device safely

#### Course Name: C303 Thermal Engineering

<i>C303.1</i>	Apply laws of thermodynamics to devices based on thermodynamics.
<i>C303.2</i>	Use first law of thermodynamics for ideal gas in closed system.
<i>C303.3</i>	Use relevant steam boilers.
<i>C303.4</i>	Use relevant steam nozzles and turbines.
<i>C303.5</i>	Use relevant steam condenser.
<i>C303.6</i>	Use suitable modes of heat transfer.

#### Course Name: C304 Mechanical Working Drawing

<i>C304.1</i>	Draw development of lateral surface of various solid
<i>C304.2</i>	Draw intersection curves of different solids
<i>C304.3</i>	Use various drawing codes, conventions and symbol as per IS SP-46
<i>C304.4</i>	Draw production drawing used to produce products
<i>C304.5</i>	Draw assembly and detailed drawing of products

**Course Name: C305 Engineering Metrology**

<i>C305.1</i>	Select the relevant instrument for measurement.
<i>C305.2</i>	Use different types of comparators.
<i>C305.3</i>	Select gauge, fits, and tolerance for machine component.
<i>C305.4</i>	Use relevant instrument to measure different parameters of screw thread and gear.
<i>C305.5</i>	Use linear and angular measuring instruments.
<i>C305.6</i>	Select relevant surface testing machine.

**Course Name: C306 Mechanical Engineering Materials**

<i>C306.1</i>	Identify properties of material.
<i>C306.2</i>	Select relevant ferrous material for mechanical components.
<i>C306.3</i>	Select relevant cast iron for the engineering application.
<i>C306.4</i>	Use non ferrous metal for mechanical components
<i>C306.5</i>	Suggest relevant advanced material for mechanical component.
<i>C306.6</i>	Select relevant heat treatment process.

#### 4<sup>th</sup> Semester

##### Course Name: C401 Theory Of Mechanics

<i>C401.1</i>	Identify various links in popular mechanism
<i>C401.2</i>	Select suitable mechanism for various applications
<i>C401.3</i>	Interpret the motion of cam and followers
<i>C401.4</i>	Recommend relevant belts, chain and drive for different application
<i>C401.5</i>	Choose relevant brakes and clutches for various application
<i>C401.6</i>	Select suitable flywheel and governor for various applications

##### Course Name: C402 Mechanical Engineering Measurements

<i>C402.1</i>	Use relevant instrument for measuring displacement.
<i>C402.2</i>	Use relevant instrument for measuring force and torque
<i>C402.3</i>	Use relevant pressure and temperature measuring instrument
<i>C402.4</i>	Use relevant instrument for measuring of flow
<i>C402.5</i>	Use relevant instrument for measurement of vibration and strain
<i>C402.6</i>	Use relevant instrument for speed and sound measurement

##### Course Name: C403 Fluid Mechanics & Machinery

<i>C403.1</i>	Use manometer and bourdon gauge to measure pressure
<i>C403.2</i>	Use flow meter to measure the rate of flow
<i>C403.3</i>	Maintain flow through pipes
<i>C403.4</i>	Maintain the jet impact on various types of vanes
<i>C403.5</i>	Maintain hydraulic turbines
<i>C403.6</i>	Maintain hydraulic pumps

##### Course Name: C404 Manufacturing Processes

<i>C404.1</i>	Procedure jobs using lathe and drilling machine
<i>C404.2</i>	Produce jobs using shaping and slotting operation
<i>C404.3</i>	Prepare product using different casting processes
<i>C404.4</i>	Prepare product using different forming processes
<i>C404.5</i>	Use joining process to produce jobs

**Course Name: C405 Environmental Studies**

<i>C405.1</i>	Develop public awareness about environment
<i>C405.2</i>	Select alternative energy resources for engineering practice
<i>C405.3</i>	Conserve ecosystem and biodiversity
<i>C405.4</i>	Apply techniques to reduce environmental pollution
<i>C405.5</i>	Manage social issue and environmental ethics as lifelong learning

**Course Name: C406 Computer Aided Drafting**

<i>C406.1</i>	Use file management techniques in a CAD software
<i>C406.2</i>	Draw complex 2D geometric figures using CAD software
<i>C406.3</i>	Modify complex 2D geometric figure using a CAD software
<i>C406.4</i>	Use software to dimension and write text on existing 2D geometric entities
<i>C406.5</i>	Use software to plot existing drawing with desired plot parameter
<i>C406.6</i>	Create isometric drawing using a CAD software
<i>C406.7</i>	Use layers and blocks to create digital drawing using relevant soft wares

**Course Name: C407 Fundamental Of Mechatronics**

<i>C407.1</i>	Identify different instruments, sensors, actuators, microprocessor, Software and mechanical components in mechatronics based system
<i>C407.2</i>	Use sensor for different mechatronics based systems.
<i>C407.3</i>	Use transducers for different mechatronics based application
<i>C407.4</i>	Use actuators for various mechatronics based applications
<i>C407.5</i>	Programme PLC for various applications
<i>C407.6</i>	Use microprocessor and microcontroller for various mechatronics based applications



## 5<sup>th</sup> Semester

### Course Name: C501 Management

<i>C501.1</i>	Use basic management principles to executes daily activities
<i>C501.2</i>	Use principles of planning and organizing for accomplished of tasks.
<i>C501.3</i>	Use principles of directing and controlling for implementing the plans.
<i>C501.4</i>	Apply principles of safety management in all activities
<i>C501.5</i>	Understand various provisions of industrial acts.

### Course Name: C502 Power Engineering. & Refrigeration

<i>C502.1</i>	Identify different components of I.C engine and its auxiliaries.
<i>C502.2</i>	Test the performance of I.C
<i>C502.3</i>	Maintain reciprocating air compressors.
<i>C502.4</i>	Identify different components of gas turbines and jet engines.
<i>C502.5</i>	Test the performance of refrigerator and air-conditioning systems.

### Course Name: C503 Advanced Manufacturing Processes

<i>C503.1</i>	Maintain the non conventional machining process to produce complex and hard to machine components,
<i>C503.2</i>	Produce components using milling machine
<i>C503.3</i>	Choose relevant machining process to produce gears.
<i>C503.4</i>	Maintain CNC machine to produce components effectively.
<i>C503.5</i>	Prepare CNC part programs for simple components.
<i>C503.6</i>	Maintain the functioning of automated equipment

### Course Name: C504 Element Of Machine Design

<i>C504.1</i>	Select suitable materials for designing machine elements.
<i>C504.2</i>	Design joints and levers for various applications.
<i>C504.3</i>	Design the power transmission elements like shafts, keys and couplings.
<i>C504.4</i>	Recommend the power screws and suitable fasteners for different applications.
<i>C504.5</i>	Choose springs for various applications
<i>C504.6</i>	Select standard components with their specifications from manufactures catalogue.

**Course Name: C505 Tool Engineering**

<i>C505.1</i>	Interpret geometric of various cutting tools.
<i>C505.2</i>	Use relevant cutting tool insert and tool holders for different machining operations.
<i>C505.3</i>	Use relevant locating and clamping device for components.
<i>C505.4</i>	Use relevant jig and fixture for components and machining operations.
<i>C505.5</i>	Use relevant press tools and press tools operations.
<i>C505.6</i>	Use relevant Die for bending and forging simple components.

**Course Name: C506 Solid Modeling & Additive Manufacturing**

<i>C506.1</i>	Prepare 2D drawing using sketcher workbench of any parametric CAD software.
<i>C506.2</i>	Generate 3D solid model from 2D sketch using part workbench of any parametric CAD software,
<i>C506.3</i>	Prepare assembly of part models using assembly workbench of any parametric CAD software.
<i>C506.4</i>	Generate orthographic views of 3D solid models/assemblies using drafting workbench of any parametric CAD software.
<i>C506.5</i>	Plot a drawing for given part models/assembly.
<i>C506.6</i>	Print components using 3D Printer/Rapid prototype machine

**Course Name: C507 Industrial Training**

<i>C507.1</i>	Communicate effectively (verbal as well as written) the work carried out.
<i>C507.2</i>	Prepare and present the report of the work carried out.
<i>C507.3</i>	Exercise time management and safety in the work environment.
<i>C507.4</i>	Working in a team.
<i>C507.5</i>	Demonstrate various quality assurances.
<i>C507.6</i>	Exhibit the work carried out.

**Course Name: C508 Capstone Project Planning**

<i>C508.1</i>	Write the problem/task specification in existing systems related to the occupation.
<i>C508.2</i>	Select, collect and use required information/knowledge to solve the problem/complete the task.
<i>C508.3</i>	Logically choose relevant possible solutions.
<i>C508.4</i>	Consider the ethical issues related to the project (if there are any)
<i>C508.5</i>	Assess the impact of the project on society (if there is any)
<i>C508.6</i>	Prepare 'project proposals' with action plan and time duration scientifically before beginning of project.

## 6<sup>th</sup> Semester

### Course Name: C601 Emerging Trends In Mechanical Engineering

<i>C601.1</i>	Identify different new system available in automobile.
<i>C601.2</i>	Apply heat engineering principles in process boiler and waste heat recovery systems used in process industry.
<i>C601.3</i>	Cite example of modern manufacturing technology in industry.
<i>C601.4</i>	Use different standards for energy management and audit of given system.
<i>C601.5</i>	Select recent agriculture equipment for pre and post handling.

### Course Name: C602 Industrial Hydraulic and Pneumatics

<i>C602.1</i>	Identify various components of hydraulic and pneumatic system.
<i>C602.2</i>	Select pump and actuators for given fluid operated system.
<i>C602.3</i>	Select appropriate control valves for given fluid operated system.
<i>C602.4</i>	Select compressor and appropriate accessories for given fluid operated system.
<i>C602.5</i>	Develop different hydraulic circuits for given simple application.
<i>C602.6</i>	Develop different pneumatic circuits for given simple application

### Course Name: C603 Automobile Engineering

<i>C603.1</i>	Prepare vehicle layouts with chassis specification.
<i>C603.2</i>	Interpret power flow diagram of transmission system.
<i>C603.3</i>	Select suitable braking and steering system for different applications.
<i>C603.4</i>	Select suspension system for different application.
<i>C603.5</i>	Prepare simple electric-electronic circuit for automobile systems.
<i>C603.6</i>	Select service tools for relevant service operation in automobile shops.

### Course Name: C604 Industrial Engineering and Quality Control

<i>C604.1</i>	Apply work study techniques to optimize manufacturing processes.
<i>C604.2</i>	Prepare the detained sequence of operations for manufacturing of components.
<i>C604.3</i>	Apply Ergonomic principle for designing simple mechanical component.
<i>C604.4</i>	Interpret the data obtained from the different quality control processes.
<i>C604.5</i>	Interpret control charts for variable and attribute data.

**Course Name: C605 Refrigeration and Air Conditioning**

<b>C605.1</b>	Use refrigeration system for given application.
<b>C605.2</b>	Use relevant refrigerants for different applications.
<b>C605.3</b>	Select different refrigeration components for given refrigeration system.
<b>C605.4</b>	Select different air conditioning components for given air-conditioning system.
<b>C605.5</b>	Determine cooling loads for Air-conditioning systems.
<b>C605.6</b>	Select relevant tools for maintaining air conditioning systems.

**Course Name: C606 Entrepreneurship Development**

<b>C606.1</b>	Identify your entrepreneurial trails.
<b>C606.2</b>	Identify the business opportunities that suit you.
<b>C606.3</b>	Use the support systems to zero down to your business idea.
<b>C606.4</b>	Develop comprehensive business plans.
<b>C606.5</b>	Prepare plans to manage the enterprise effectively.

**Course Name: C607 Capstone Project Execution and Report Writing**

<b>C607.1</b>	Implement the planned activity individually and/or as team.
<b>C607.2</b>	Select, collect and use required information/knowledge to solve the identified problem.
<b>C607.3</b>	Take appropriate decision based on collected and analysed information.
<b>C607.4</b>	Incorporate energy and environment conservation principles.
<b>C607.5</b>	Consider the ethical issues related to the project.(if there are any)
<b>C607.6</b>	Assess the impact of the project on society
<b>C607.7</b>	Communicate effectively and confidently as a member and leader of team.



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