

**KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**NAMAKKAL- TRICHY MAIN ROAD, THOTTIAM**  
 (Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)  
 (Accredited by NBA, Accredited by NAAC with B++ Grade, Recognized by  
 UGC with 2(f) & 12(B) and An ISO 9001:2015 Certified Institution)

**DEPARTMENT OF MECHANICAL ENGINEERING**

**List of Subjects: (Regulation 2017)**

S.No.	Course code	Subject code	Course Name
<b>Semester I</b>			
1.	C101	HS8151	Communicative English
2.	C102	MA8151	Engineering Mathematics - I
3.	C103	PH8151	Engineering Physics
4.	C104	CY8151	Engineering Chemistry
5.	C105	GE8151	Problem Solving and Python Programming
6.	C106	GE8152	Engineering Graphics
7.	C107	GE8161	Problem Solving and Python Programming Laboratory
8.	C108	BS8161	Physics and Chemistry Laboratory
<b>Semester II</b>			
9.	C109	HS8251	Technical English
10.	C110	MA8251	Engineering Mathematics - II
11.	C111	PH8251	Materials Science
12.	C112	BE8253	Basic Electrical, Electronics and Instrumentation Engineering
13.	C113	GE8291	Environmental Science and Engineering
14.	C114	GE8292	Engineering Mechanics
15.	C115	GE8261	Engineering Practices Laboratory
16.	C116	BE8261	Basic Electrical, Electronics and Instrumentation Engineering Laboratory
<b>Semester III</b>			
17.	C201	MA8353	Transforms and Partial Differential Equations
18.	C202	ME8391	Engineering Thermodynamics
19.	C203	CE8394	Fluid Mechanics and Machinery
20.	C204	ME8351	Manufacturing Technology - I
21.	C205	EE8353	Electrical Drives and Controls
22.	C206	ME8361	Manufacturing Technology Laboratory - I
23.	C207	ME8381	Computer Aided Machine Drawing
24.	C208	EE8361	Electrical Engineering Laboratory
25.	C209	HS8381	Interpersonal Skills / Listening & Speaking
<b>Semester IV</b>			
26.	C210	MA8452	Statistics and Numerical Methods
27.	C211	ME8492	Kinematics of Machinery
28.	C212	ME8451	Manufacturing Technology – II
29.	C213	ME8491	Engineering Metallurgy
30.	C214	CE8395	Strength of Materials for Mechanical Engineers
31.	C215	ME8493	Thermal Engineering- I

32.	C216	ME8462	Manufacturing Technology Laboratory – II
33.	C217	CE8381	Strength of Materials and Fluid Mechanics and Machinery Laboratory
34.	C218	HS8461	Advanced Reading and Writing
<b>Semester V</b>			
35.	C301	ME8595	Thermal Engineering- II
36.	C302	ME8593	Design of Machine Elements
37.	C303	ME8501	Metrology and Measurements
38.	C304	ME8594	Dynamics of Machines
39.	C305	OA1553	Production Technology for Agricultural Machinery
40.	C306	ME8511	Kinematics and Dynamics Laboratory
41.	C307	ME8512	Thermal Engineering Laboratory
42.	C308	ME8513	Metrology and Measurements Laboratory
<b>Semester VI</b>			
43.	C309	ME8651	Design of Transmission Systems
44.	C310	ME8691	Computer Aided Design and Manufacturing
45.	C311	ME8693	Heat and Mass Transfer
46.	C312	ME8692	Finite Element Analysis
47.	C313	ME8694	Hydraulics and Pneumatics
48.	C314	ME8091	Automobile Engineering
49.	C315	ME8681	CAD / CAM Laboratory
50.	C316	ME8682	Design and Fabrication Project
51.	C317	HS8581	Professional Communication

### Course Outcomes of all subjects

#### **Semester I**

<b>COMMUNICATIVE ENGLISH : C101</b>	
<b>C101.1</b>	Understand clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies
<b>C101.2</b>	Analyzing cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic
<b>C101.3</b>	Create different genres of texts adopting various reading strategies
<b>C101.4</b>	Understand different spoken discourses and different accents
<b>C101.5</b>	Understand intonations of the speaker while communicating as well as development of creative writing.

<b>ENGINEERING MATHEMATICS I : C102</b>	
<b>C102.1</b>	Use both the limit definition and rules of differentiation to differentiate functions. Apply differentiation to solve maxima and minima problems.
<b>C102.2</b>	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
<b>C102.3</b>	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
<b>C102.4</b>	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
<b>C102.5</b>	Apply various techniques in solving differential equations.

<b>ENGINEERING PHYSICS : C103</b>	
<b>C103.1</b>	Gain knowledge on the properties of matter and its applications.
<b>C103.2</b>	Understand the concepts of waves and optical devices and its applications.
<b>C103.3</b>	Analyze the thermal properties of materials and their applications
<b>C103.4</b>	To get knowledge about advanced physics concepts of quantum theory
<b>C103.5</b>	Achieve the knowledge about various crystals structures and its growth techniques.

<b>ENGINEERING CHEMISTRY : C104</b>	
<b>C104.1</b>	Gain knowledge on the water quality parameters.
<b>C104.2</b>	Understand the types of catalysis & Identify the applications of adsorption.
<b>C104.3</b>	Analyse the types of phase in a system & various alloys
<b>C104.4</b>	Evaluate the characteristics of various fuels & its applications.
<b>C104.5</b>	Achieve the knowledge about various energy sources & its applications.

<b>PROBLEM SOLVING AND PYTHON PROGRAMMING : C105</b>	
<b>C105.1</b>	Develop algorithmic solutions to simple computational problems
<b>C105.2</b>	Read, write, execute by hand simple Python programs.
<b>C105.3</b>	Decompose a Python program into functions.
<b>C105.4</b>	Represent compound data using Python lists, tuples, and dictionaries.
<b>C105.5</b>	Read and write data from/to files in Python Programs.

<b>ENGINEERING GRAPHICS: C106</b>	
<b>C106.1</b>	Effectively understand the practical applications of conics, special curves and freehand sketching.
<b>C106.2</b>	Implement the drawing skills in points, lines and planes.
<b>C106.3</b>	Enhance the solid projections in pyramid, prisms, cylinder and cones.
<b>C106.4</b>	Understand clearly the concepts of sectioning and development of solids in pyramid, prisms, cylinder and cones.
<b>C106.5</b>	Improve the engineering knowledge in frustrum & truncated solids, visual ray methods.

<b>PROBLEM SOLVING AND PYTHON PROGRAMMING : C107</b>	
<b>C107.1</b>	Develop algorithmic solutions to simple computational problems, Write, test, and debug simple Python programs.
<b>C107.2</b>	Read, write, execute by handle simple Python programs, Implement Python programs with conditionals and loops.
<b>C107.3</b>	Develop Python programs step-wise by defining functions and calling them.
<b>C107.4</b>	Use Python lists, tuples, dictionaries for representing compound data.
<b>C107.5</b>	Read and write data from/to files in Python

<b>PHYSICS-CHEMISTRY LABORATORY : C108</b>	
<b>C108.1</b>	Analyse the characteristics of engineering materials.
<b>C108.2</b>	Find out the physical properties of matter.
<b>C108.3</b>	Assess the water quality parameter.
<b>C108.4</b>	Analyse the pH of aqueous solutions.
<b>C108.5</b>	Gain knowledge on chemical properties of liquids.

## Semester II

<b>TECHNICAL ENGLISH : C109</b>	
<b>C109.1</b>	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
<b>C109.2</b>	Recognize to frame effective types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing to determine their writing skill.
<b>C109.3</b>	Attribute to read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentations.
<b>C109.4</b>	Listen different spoken excerpts critically and infer unspoken and implied meanings
<b>C109.5</b>	Analyze to participant in a group discussion and understanding technical articles.

<b>ENGINEERING MATHEMATICS II: C110</b>	
<b>C110.1</b>	Eigen values and eigenvectors, Diagonalization of a matrix, Symmetric matrices, Positivedefinite matrices and similar matrices
<b>C110.2</b>	Generalize about vector differentiation, line, surface and volume integrals and theorems involving them.
<b>C110.3</b>	Examine analytic functions and its properties, conformal mapping and its applications.
<b>C110.4</b>	Summarize the concepts of complex integration.
<b>C110.5</b>	Use knowledge of Laplace transform and its properties, inverse Laplace transform to solve linear differential equations.

<b>MATERIALS SCIENCE : C111</b>	
<b>C111.1</b>	Remember the various phase diagrams and their applications
<b>C111.2</b>	Apply the concept of phase diagram on Fe-Fe <sub>3</sub> C.
<b>C111.3</b>	Remember the mechanical properties of materials and their measurements.
<b>C111.4</b>	Analysis on magnetic, dielectric and superconducting properties of materials.
<b>C111.5</b>	Understand the basics of ceramics, composites and nano materials.

<b>BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING – C112</b>	
<b>C112.1</b>	Applying the electrical concepts in problems.
<b>C112.2</b>	Analyzing the nature of the waveform in AC circuits.
<b>C112.3</b>	Demonstrating the working principles of electrical machines.
<b>C112.4</b>	Illustrate the behavior of various electronic devices.
<b>C112.5</b>	Choosing appropriate instruments for electrical instrument for a specific application.

<b>ENVIRONMENTAL SCIENCE AND ENGINEERING: C113</b>	
<b>C113.1</b>	Gain knowledge on public awareness & about the Environment & Ecosystem.
<b>C113.2</b>	Identify the impacts of Pollution.
<b>C113.3</b>	Achieve Sustainable development.
<b>C113.4</b>	Analyze about the social issues in the Environment.
<b>C113.5</b>	Apply the knowledge to tackle the problems of over population.

<b>ENGINEERING MECHANICS C114</b>	
<b>C114.1</b>	Illustrate the vectorial and scalar representation of forces and moments.
<b>C114.2</b>	Analyse the equilibrium of rigid bodies in two dimensions and three dimensions.
<b>C114.3</b>	Evaluate the properties of surfaces and solids.
<b>C114.4</b>	Study the effects of dynamic forces in particle.
<b>C114.5</b>	Determine the friction and the effects by the laws of friction.

<b>ENGINEERING PRACTICES LABORATORY : C115</b>	
<b>C115.1</b>	Plumbing and carpentry areas regard to pipeline joints, household fittings, water supply and sewage works, joints in roofs, doors, windows and furniture.
<b>C115.2</b>	Analyzing the engineering knowledge through welding, machining, sheetmetal categories in gas welding, facing, turning, forming and bending operations.
<b>C115.3</b>	Understanding the assembly works on study of pump, a/c and demonstration works on Smithy, foundry and fitting operations.
<b>C115.4</b>	Perceiving knowledge on various basic in electrical engineering in simple domestic wiring circuits and relationship between the various electrical parameters.
<b>C115.5</b>	Comparing and analyzing the performance of basic electronic devices and build a simple electronic circuits and Printed Circuit Boards.

<b>BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING Laboratory C116</b>	
<b>C116.1</b>	Able to test and analyze the load characteristics of dc generator and transformer.
<b>C116.2</b>	Ability to determine the speed characteristic of different electrical machines.
<b>C116.3</b>	Ability to design simple circuits involving diodes and transistors.
<b>C116.4</b>	Ability to gain practical experience on electric circuits and verification of theorems.
<b>C116.5</b>	Ability to understand the importance of various types of sensor and its applications.

### Semester III

<b>Transforms and Partial Differential Equations: C201</b>	
C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

<b>Engineering Thermodynamics : C202</b>	
C202.1	Students should understand the Flow process and non flow process along with steady flow energy equation.
C202.2	Students should able to carry out the Problems occurs in heat engine and heat pump.
C202.3	Students should understand the principles involved in Rankine cycles
C202.4	Students should perform the calculations with basic thermodynamic relation.
C202.5	Students should be able to Know about vapour mixtures and psychrometric process.

<b>Fluid Mechanics and Machinery : C203</b>	
C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C203.2	Analyze and calculate major and minor losses associated with pipe flow in piping networks.
C203.3	Evaluate and predict the nature of physical quantities
C203.4	Analyze and improve the performance of various types of pumps
C203.5	Analyze and improve the efficiencies of various types of turbines

<b>Manufacturing Technology – I : C204</b>	
C204.1	Understand the casting process and its defects.
C204.2	Identify the various types of welding processes and its defects.
C204.3	Summarize various hot working and cold working methods of metals such as rolling and extrusion.
C204.4	Expertise in the area of sheet metal fabrication and its latest techniques.
C204.5	Illustration on methods of manufacturing of plastic components.

<b>Electrical Drives and Controls : C205</b>	
C205.1	Understand the basics of different types of electrical drives and their selection based on power, load and thermal conditions.
C205.2	Examine basic concepts of different types of electrical machines and their characteristics, braking techniques.
C205.3	Inspect the different starting methods of DC motors and induction motors.
C205.4	Summarize the conventional and solid state speed control of DC drives.
C205.5	Investigate the conventional and solid state speed control of AC drives.

<b>Manufacturing Technology Laboratory – I : C206</b>	
C206.1	Demonstrate the safety precautions exercised in the mechanical workshop.
C206.2	Create the work piece as per given shape and size using Lathe.
C206.3	Build two metals using arc welding.
C206.4	Utilize sheet metal fabrication tools and make simple tray and funnel.
C206.5	Utilize different moulding tools, patterns and prepare sand moulds.

<b>Computer Aided Machine Drawing : C207</b>	
C207.1	Effectively Understand the standards used in codes, BIS specifications and references for mechanical components.
C207.2	Create the dimensions, part drawings, production drawings and its assemblies by using limits, fits and tolerances.
C207.3	Develop the ideas in two dimensional drafting using software tools.
C207.4	Design and modeling the three dimensioned parts through auto CAD tools for creation of couplings and joints.
C207.5	Summarize the engine & miscellaneous machine components in the part drawing assembly.

<b>Electrical Engineering Laboratory : C208</b>	
C208.1	Explain the speed controls of different types of DC motors and their characteristics.
C208.2	Examine the speed controls of different types of DC generators and their characteristics.
C208.3	Analyze the different connections and testing methods of Transformers.
C208.4	Summarize load test and speed control of AC motors.
C208.5	Investigate the EMF and MMF methods of alternator and its characteristics.

<b>Interpersonal Skills / Listening &amp; Speaking: C209</b>	
C209.1	Acquire the listening skills to lead successful career in their work place.
C209.2	Attain articulation knowledge on native speaker- like intonation, rhythm and stress.
C209.3	Identify appropriate vocabulary and correct words to reply others.
C209.4	Understand key skills and behavior required to facilitate a group discussion.
C209.5	Participate confidently and appropriately in presentation.

### Semester IV

<b>Statistics and Numerical Methods : C210</b>	
C210.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C210.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C210.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C210.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications

<b>Kinematics of Machinery : C211</b>	
C211.1	Discuss the basics of mechanism.
C211.2	Calculate velocity and acceleration in simple mechanisms.
C211.3	Develop CAM profiles.
C211.4	Solve problems on gears and gear trains.
C211.5	Examine friction in machine elements.

<b>Manufacturing Technology– II : C212</b>	
C212.1	Study the various mechanism in material removal process.
C212.2	Gain the knowledge in various types of lathe.
C212.3	Understand the constructional and operational features of shaper, milling, drilling, and gear cutting machines with its operations.
C212.4	Learn the different types of grinding and broaching machines.
C212.5	Illustrate the working of NC and CNC machines.

<b>Engineering Metallurgy : C213</b>	
C213.1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C213.2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
C213.3	Clarify the effect of alloying elements on ferrous and non-ferrous metals
C213.4	Summarize the properties and applications of nonmetallic materials.
C213.5	Explain the testing of mechanical properties.

<b>Strength of Materials for Mechanical Engineers: C214</b>	
C214.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C214.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C214.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C214.4	Calculate the slope and deflection in beams using different methods.
C214.5	Analyze and design thin and thick shells for the applied internal and external pressures.

<b>Thermal Engineering - I : C215</b>	
C215.1	Apply thermodynamic concepts to different air standard cycles and solve problems.
C215.2	Solve problems in single stage and multistage air compressors
C215.3	Explain the functioning and features of IC engines, components and auxiliaries.
C215.4	Calculate performance parameters of IC Engines.
C215.5	Explain the flow in Gas turbines and solve problems.

<b>Manufacturing Technology Laboratory–II : C216</b>	
C216.1	Use different machine tools in special machine for various operations.
C216.2	Ability to use different machine tools to manufacturing gears.
C216.3	Ability to use different machine tools for finishing operations
C216.4	Ability to manufacture tools using cutter grinder
C216.5	Develop CNC part programming

<b>Strength of Materials and Fluid Mechanics and Machinery Laboratory: C217</b>	
C217.1	To obtain the characteristics of mild steel specimen under various load condition by using UTM.
C217.2	To determine the Modulus of rigidity of steel using torsion test, spring test and analyze the toughness of a specimen using Impact testing machine
C217.3	To test the hardness of a material by Rockwell, Brinell and Vicker Hardness test.
C217.4	Use the measurement equipments for flow measurement
C217.5	Students will be able to estimate the optimum efficiency of a given pump/turbine under different load and (or) speed conditions

<b>Advanced Reading and Writing : C218</b>	
C218.1	Build vocabulary by reading, use sentences to determine meaning and point of view.
C218.2	Develop the skills of creative and critical thinking as well as pursue independent research on a focused topic.
C218.3	Apply analytical and evaluative skills appropriate to the subject, with an

	understanding of the implications and the context of their research.
C218.4	Develop their interpersonal skills to achieve goals of a company.
C218.5	Increase understanding and recall of what is read including facts and importance of the main idea

### Semester V

<b>Thermal Engineering- II : C301</b>	
C301.1	Solve problems in Steam Nozzle.
C301.2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.
C301.3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
C301.4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers.
C301.5	Solve problems using refrigerant table / charts and psychrometric charts.

<b>Design of Machine Elements: C302</b>	
C302.1	Understand the basic design concepts in machine components and stress analysis.
C302.2	Analyze the design of shaft, keys, splines and couplings design under various loading conditions.
C302.3	Evaluate the stresses on temporary and permanent joints
C302.4	Apply the design concept to perform stress analysis in springs and other engine components.
C302.5	Design the various types of bearings as well as to analyze the data.

<b>Metrology and Measurements: C303</b>	
C303.1	Understand the basic concepts in measuring instruments and errors.
C303.2	The learn about linear and angular measuring instruments with the help of vernier caliper, micrometer, autocollimator and angle dekkor.
C303.3	Extended knowledge is obtained in the field laser metrology ,cmm and machine vision system.
C303.4	Know the concepts in Form measurements techniques.(Flatness measurements, Gear measurements and Surface finish measurements).
C303.5	Enrich the skills in force, torque, flow and temperature measurements .

<b>Dynamics of Machines: C304</b>	
C304.1	Characterize the force analysis of Simple mechanism and design flywheel.
C304.2	Analyze balancing problems in rotating and reciprocating machinery.
C304.3	Execute vibration design of simple mechanical systems that can be approximated by one, two degree of freedom systems..
C304.4	Compute the frequency of forced vibration and damping coefficient.
C304.5	Analyze and design centrifugal governors and Estimate the gyroscopic effects of sea vehicles, aircrafts and automobile vehicles.

<b>Production Technology for Agricultural Machinery : C305</b>	
C305.1	Apply the different materials, their processing, in suitable application in mechanical engineering fields.
C305.2	Apply the different manufacturing process and use this in industry for component production.

C305.3	Understand the construction and working principles of gas, arc welding and resistance welding process.
C305.4	Demonstrate different unconventional machining processes and know the influence of difference process parameters on the performance and their applications.
C305.5	Understand and compare the functions and applications of different metal cutting tools and also demonstrate the programming in CNC machining.

<b>Kinematics and Dynamics Laboratory: C306</b>	
C306.1	Understand the working of gear trains, slider crank Mechanism, and analysis of Mass moment of Inertia in various apparatus.
C306.2	Demonstrate and study about gyroscopic effect and couple
C306.3	Students can understand the range sensitivity in governors and study about cam jump phenomenon.
C306.4	Students can able to determine the frequency of various systems and vibrations.
C306.5	Students should be able to calculate critical speed of shaft and free and forced vibration of beams.

<b>Thermal Engineering Laboratory : C307</b>	
C307.1	Determine the valve timing and port timing diagram of an IC engines.
C307.2	Compute the property of fuels and lubricating oils using suitable tests.
C307.3	Analyse the performance and energy balance test on boiler and turbine.
C307.4	Learn about the heat transfer coefficient under natural and forced convection mode.
C307.5	Ability to demonstrate Effectiveness and COP of various Refrigeration and Air conditioning systems.

<b>Metrology and Measurements Laboratory : C308</b>	
C308.1	Gain knowledge and skills on different standards and calibration processes
C308.2	Ability to Handle the different measurement tools and measuring techniques like sine bar for angular measurements.
C308.3	Study and analyze the characteristics of accuracy and precision instruments like Autocollimator and Toolmaker microscope..
C308.4	Demonstrate the contact and non contact measuring instruments, limit gauges and comparators
C308.5	Acquire knowledge on geometrical parameters like straightness, flatness, roundness, parallelism etc.,

### Semester VI

<b>Design of Transmission Systems : C309</b>	
C309.1	Understand the basic concepts of design to belts, chains and rope drives.
C309.2	Able to compute the beam strength and dynamic load acting on spur gear and helical gears.
C309.3	Calculate the beam strength and dynamic load acting on worm and bevel gears.
C309.4	Apply the design concepts in gear boxes.
C309.5	Able to summarize the concepts of design in cams, brakes and clutches.

<b>Computer Aided Design and Manufacturing: C310</b>	
C310.1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
C310.2	Explain the fundamentals of parametric curves, surfaces and Solids
C310.3	Summarize the different types of Standard systems used in CAD
C310.4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines
C310.5	Summarize the different types of techniques used in Cellular Manufacturing and FMS

<b>Heat and Mass Transfer : C311</b>	
C311.1	Understand the concepts of conduction heat transfer and extended surfaces
C311.2	Solve the forced and free convective heat transfer in external and internal flows
C311.3	Evaluate the sizing of heat exchangers and phase change process
C311.4	Analyze the emissivity for black and gray bodies, radiation shield and radiation through gases.
C311.5	Apply the phenomenon of diffusion and convective mass transfer

<b>Finite Element Analysis : C312</b>	
C312.1	Apply finite element method to solve problems in solid mechanics, fluid mechanics and heat transfer.
C312.2	Formulate and solve problems in one dimensional structural. thermal and dynamic problems including trusses, beams and frames.
C312.3	Formulate FE characteristic equations for two dimensional elements and analyze plain stress and plain strain
C312.4	Predict finite element equations for axisymmetric bodies, plates and shell.
C312.5	Make use of finite element principles in isoparametric applications and Apply matrix solution techniques to dynamic problems.

<b>Hydraulics and Pneumatics : C313</b>	
C313.1	Explain the Fluid power and operation of different types of pumps.
C313.2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
C313.3	Explain the different types of Hydraulic circuits and systems
C313.4	Explain the working of different pneumatic circuits and systems
C313.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.

<b>Automobile Engineering : C314</b>	
C314.1	Recognize the various parts of the automobile and their functions with its materials
C314.2	Discuss the engine auxiliary systems and engine emission control
C314.3	Distinguish the working of different types of power transmission systems like clutch, gears etc.,
C314.4	Explanation about the Steering, Brakes and Suspension systems
C314.5	Predict possible alternate sources of energy for IC Engines.

<b>CAD / CAM Laboratory : C315</b>	
C315.1	Learn about basics of 2D models using modelling software
C315.2	Ability to develop 3D models using modelling software
C315.3	Learn the commands used for CNC machine
C315.4	Ability to prepare CNC part programming and perform manufacturing
C315.5	Understand the application of various CNC machines like CNC lathe, CNC Vertical Machining centre, CNC EDM and CNC wire-cut and studying of Rapid prototyping

<b>Design and Fabrication Project : C316</b>	
C316.1	Competence in fundamental and advance knowledge of mechanical equipments.
C316.2	Graduates will be able to identify and define problems in the area of Mechanical field.
C316.3	Graduates will be able to explain and illustrate their practical skills needed to understand and modify problems related to manufacturing and designing.
C316.4	Graduates will get a chance to apply current technologies , create tools and solve problems.
C316.5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills.

<b>Professional Communication: C317</b>	
C317.1	Make effective presentations
C317.2	Participate confidently in Group Discussions
C317.3	Attend job interviews and be successful in them.
C317.4	Develop adequate Soft Skills required for the workplace
C317.5	Recognizing differences between groups and teams