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 2013)			
Semester V			
1.	C301	ME6501	Computer Aided Design
2.	C302	ME6502	Heat and Mass Transfer
3.	C303	ME6503	Design of Machine Elements
4.	C304	ME6504	Metrology and Measurements
5.	C305	ME6505	Dynamics of Machines
6.	C306	GE6075	Professional Ethics in Engineering
7.	C307	ME6511	Dynamics Laboratory
8.	C308	ME6512	Thermal Engineering Laboratory-II
9.	C309	ME6513	Metrology and Measurements Laboratory
Semester VI			
10.	C310	ME6601	Design of Transmission Systems
11.	C311	MG6851	Principles of Management
12.	C312	ME6602	Automobile Engineering
13.	C313	ME6603	Finite Element Analysis
14.	C314	ME6604	Gas Dynamics and Jet Propulsion
15.	C315	ME6004	Unconventional Machining Processes
16.	C316	ME6611	C.A.D. / C.A.M. Laboratory
17.	C317	ME6612	Design and Fabrication Project
18.	C318	GE6563	Communication Skills - Laboratory Based
Semester VII			
19.	C401	ME6701	Power Plant Engineering
20.	C402	ME6702	Mechatronics
21.	C403	ME6703	Computer Integrated Manufacturing systems
22.	C404	GE6757	Total Quality Management
23.	C405	ME6005	Process Planning and Cost Estimation
24.	C406	ME6012	Maintenance Engineering
25.	C407	ME6711	Simulation and Analysis Laboratory
26.	C408	ME6712	Mechatronics Laboratory
27.	C409	ME6713	Comprehension
Semester VIII			
28.	C410	MG6863	Engineering Economics
29.	C411	IE6605	Production Planning and Control
30.	C412	ME6016	Advanced I.C. Engines
31.	C413	ME6811	Project Work

Course Outcomes of all subjects
Semester V

Computer Aided Design : C301	
C301.1	Understand the basic concepts of system architecture and computer graphics.
C301.2	Design the basic curves in geometric modeling and solid modeling techniques .
C301.3	Create the modeling surfaces by using various algorithms.
C301.4	Applying the concept of assembly modeling for mechanism simulation and interference checking.
C301.5	Evaluate the various computer graphics techniques and communication standards.

Heat and Mass Transfer : C302	
C302.1	Understand the concepts of conduction heat transfer and extended surfaces
C302.2	Solve the forced and free convective heat transfer in external and internal flows
C302.3	Evaluate the sizing of heat exchangers and phase change process
C302.4	Analyze the emissivity for black and gray bodies, radiation shield and radiation through gases.
C302.5	Apply the phenomenon of diffusion and convective mass transfer

Design of Machine Elements : C303	
C303.1	Understand the basic design concepts in machine components and stress analysis.
C303.2	Analyze the design of shaft, keys, splines and couplings design under various loading conditions.
C303.3	Evaluate the stresses on temporary and permanent joints
C303.4	Apply the design concept to perform stress analysis in springs and other engine components.
C303.5	Design the various types of bearings as well as to analyze the data.

Metrology and Measurements : C304	
C304.1	Understand the basic concepts in measuring instruments and errors.
C304.2	The learn about linear and angular measuring instruments with the help of vernier caliper, micrometer, .autocollimator and angle dekkor.
C304.3	Extended knowledge is obtained in the field laser metrology ,cmm and machine vision system.
C304.4	Know the concepts in Form measurements techniques.(Flatness measurements, Gear measurements and Surface finish measurements).
C304.5	Enrich the skills in force, torque, flow and temperature measurements .

Dynamics of Machines : C305	
C305.1	Characterize the force analysis of Simple mechanism and design flywheel.
C305.2	Analyze balancing problems in rotating and reciprocating machinery.
C305.3	Execute vibration design of simple mechanical systems that can be approximated by one, two degree of freedom systems..
C305.4	Compute the frequency of forced vibration and damping coefficient.
C305.5	Analyze and design centrifugal governors and Estimate the gyroscopic effects of sea vehicles, aircrafts and automobile vehicles.

Professional Ethics in Engineering : C306	
C306.1	Understand the concepts of Human values, Morals and ethical values.
C306.2	Creating the awareness on issues faced by engineers in the society.
C306.3	Implementing the concept of engineering experimentation and codes of ethics.
C306.4	Explore the reduction of risk, responsiblities and professional rights of an engineer.
C306.5	Ethical knowledge in global issues and corporate social resposiblity are compiled.

Dynamics Laboratory : C307	
C307.1	Understand the working of gear trains, slider crank Mechanism, and analysis of Mass moment of Inertia in various apparatus.
C307.2	Demonstrate and study about gyroscopic effect and couple
C307.3	Students can understand the range sensitivity in governors and study about cam jump phenomenon.
C307.4	Students can able to determine the frequency of various systems and vibrations.
C307.5	Students should be able to calculate critical speed of shaft and free and forced vibration of beams.

Thermal Engineering Laboratory-II : C308	
C308.1	Learn about the heat transfer coefficient under natural and forced convection mode.
C308.2	Ability to determine thermal conductivity of composite wall and thermal powders.
C308.3	Learn the heat transfer phenomena under different modes of heat transfer.
C308.4	Ability to demonstrate Effectiveness and COP of various Refrigeration and Air conditioning systems.
C308.5	Understand and Conduct performance test on compressor, refrigeration system and cooling tower.

Metrology and Measurements Laboratory : C309	
C309.1	Gain knowledge and skills on different standards and calibration processes
C309.2	Ability to Handle the different measurement tools and measuring techniques like sine bar for angular measurements.
C309.3	Study and analyze the characteristics of accuracy and precision instruments like Autocollimator and Toolmaker microscope..
C309.4	Demonstrate the contact and non contact measuring instruments, limit gauges and comparators
C309.5	Acquire knowledge on geometrical parameters like straightness, flatness, roundness, parallelism etc.,

Semester VI

Design of Transmission Systems : C310	
C310.1	Understand the basic concepts of design to belts, chains and rope drives.
C310.2	Able to compute the beam strength and dynamic load acting on spur gear and helical gears.
C310.3	Calculate the beam strength and dynamic load acting on worm and bevel gears.
C310.4	Apply the design concepts in gear boxes.
C310.5	Able to summarize the concepts of design in cams, brakes and clutches.

Principles of Management : C311	
C311.1	Understand managerial functions like planning, organizing, staffing, directing & controlling.
C311.2	Apply knowledge of planning tools and techniques on international aspect of management.
C311.3	Analyze the various types of organization and its applications
C311.4	Applying the various directing approaches and its impact.
C311.5	Evaluate the application of controlling in an organization.

Automobile Engineering : C312	
C312.1	Recognize the various parts of the automobile and their functions with its materials
C312.2	Discuss the engine auxiliary systems and engine emission control
C312.3	Distinguish the working of different types of power transmission systems like clutch, gears etc.,
C312.4	Explanation about the Steering, Brakes and Suspension systems
C312.5	Predict possible alternate sources of energy for IC Engines.

Finite Element Analysis : C313	
C313.1	Apply finite element method to solve problems in solid mechanics, fluid mechanics and heat transfer.
C313.2	Formulate and solve problems in one dimensional structural. thermal and dynamic problems including trusses, beams and frames.
C313.3	Formulate FE characteristic equations for two dimensional elements and analyze plain stress and plain strain
C313.4	Predict finite element equations for axisymmetric bodies, plates and shell.
C313.5	Make use of finite element principles in isoparametric applications and Apply matrix solution techniques to dynamic problems.

Gas Dynamics and Jet Propulsion : C314	
C314.1	Predict the difference between incompressible and compressible flow.
C314.2	Recognize the phenomenon of Fanno and Rayleigh flows.
C314.3	Distinguish the phenomenon of shock waves and its effect on flow.
C314.4	Summarize about the types of Jet engine and propulsion.
C314.5	Discuss about the Rocket propulsion and different type.

Unconventional Machining Processes : C315	
C315.1	Understand the need and classification of different unconventional machining processes.
C315.2	Explain the various mechanical energy based unconventional machining processes and applications.
C315.3	Discuss about the electrical Discharge machining with its types.
C315.4	Summarize various chemical and electro-chemical energy based unconventional machining processes.
C315.5	Make use of thermal energy processes based on different kind of materials.

C.A.D. / C.A.M. Laboratory : C316	
C316.1	Learn about basics of 2D models using modelling software
C316.2	Ability to develop 3D models using modelling software
C316.3	Learn the commands used for CNC machine
C316.4	Ability to prepare CNC part programming and perform manufacturing
C316.5	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

Design and Fabrication Project : C317	
C317.1	Competence in fundamental and advance knowledge of mechanical equipments.
C317.2	Graduates will be able to identify and define problems in the area of Mechanical field.
C317.3	Graduates will be able to explain and illustrate their practical skills needed to understand and modify problems related to manufacturing and designing.
C317.4	Graduates will get a chance to apply current technologies , create tools and solve problems.
C317.5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills.

Communication Skills - Laboratory Based : C318	
C318.1	Formulate presentations and Participate in Group Discussions.
C318.2	Prepare to answer the questions in interviews.
C318.3	Achieve international examination such as IELTS and TOEFL
C318.4	Improve the fluency in spoken English and improve in leadership trait.
C318.5	Identify their creativity and critical thinking while communicating with others.

Semester VII

Power Plant Engineering : C401	
C401.1	Understand the coal based thermal power plant layout and its systems
C401.2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
C401.3	Describe the layout, construction and working of the components inside nuclear power plants
C401.4	Discuss the layout, construction and working of the components inside Renewable energy power plants
C401.5	Estimate the cost of electrical energy production and explain the environmental hazards

Mechatronics : C402	
C402.1	Understand the mechatronics system and Differentiate between various sensors, transducers and actuators and their applications.
C402.2	Remember the working principle of microprocessor and microcontroller.
C402.3	Evaluate the interface of PPI and various signal conditioning techniques and amplifiers.
C402.4	Apply various Programming languages with Boolean operations in PLC.

C402.5	Create the modern automation through mechatronics system

Computer Integrated Manufacturing systems : C403	
C403.1	Familier with usage of CAD/CAM system and will acquire various levels of automated controlled production concepts.
C403.2	Understand the production planning and control activities with computerized process planning to meet the specified production.
C403.3	Acquire the basic knowledge in grouping of manufacturing processes and machines.
C403.4	Apply the integration of Flexible manufacturing system with AGVS in the manufacturing activities.
C403.5	Implement the automated material handling and storage systems for a typical production system using robot

Total Quality Management : C404	
C404.1	Understand the frame work of Total Quality Management emphasizing the importance of Quality and Contribution of Gurus.
C404.2	Understand the TQM principles with reference to qualities of Leadership, Employee Involvement and Team work for the continuous process improvement.
C404.3	Apply the conventional and new management quality tool procedures for Total Quality Management.
C404.4	Apply the various tools of Performance measures for the implementation of quality management and industrial applications.
C404.5	Evaluate various quality system standards and the need for quality regulatory system and its procedures.

Process Planning and Cost Estimation : C405	
C405.1	Understand the concepts of process planning for various products.
C405.2	Illustrate the concepts of process planning activities and quality assurance methods
C405.3	Explore the different methods of cost estimation.
C405.4	Estimate the different types of Jobs.
C405.5	Determine the Machining time for various process

Maintenance Engineering : C406	
C406.1	Understand the principles and planning of various maintenance organizations.
C406.2	To know the maintenance policies and method of lubrication.
C406.3	Impart the knowledge to improve the condition of instruments.
C406.4	To perform repair methods on the instruments to improve the performance.
C406.5	Apply the knowledge on various repair methods for material handling equipment's

Simulation and Analysis Laboratory : C407	
C407.1	Demonstrate the basic tools of MATLAB
C407.2	Ability to understand the engineering problems in vibration using MATLAB
C407.3	Analyze the stresses and strains induced in plates and beams

C407.4	Analyze the stresses and strains heat transfer problems
C407.5	Calculate the natural frequency and mode shape analysis of 2D components and beams.

Mechatronics Laboratory : C408	
C408.1	Demonstrate the actuation principle of pneumatic circuits for single and double acting cylinder.
C408.2	Demonstrate the actuation principle of electro pneumatic and PLC circuits for single and double acting cylinder.
C408.3	Understand the assembly language programming of 8085 for motors.
C408.4	Understand the image process, transducers and traffic light interface principle.
C408.5	Perform the modelling and analysis of hydraulic and pneumatic circuits using software.

Comprehension : C409	
C409.1	Acquire knowledge on mechanical area
C409.2	Ability to convey easily their innovative technical thoughts among their colleague with ICT tools
C409.3	Students can able to overcome the stage fear during presentation
C409.4	Make an impressive presentation which makes the easy communication with others
C409.5	Students will be able to develop their skills for placement like stage fear, interaction with others, technical skills, communication and body language.

Semester VIII

Engineering Economics : C410	
C410.1	Apply the basics of economics and cost analysis to engineering and take economically sound decisions.
C410.2	Able to use the resources to the maximum utilization.
C410.3	Evaluate the investment decision by using cash flow methods.
C410.4	Select the best machine to increase the productivity and reduce the maintenance cost .
C410.5	Gain knowledge in selecting the best alternatives for profit maximization.

Production Planning and Control : C411	
C411.1	Apply the production planning concepts in various aspects like marketing, operational, durability and break even analysis
C411.2	Able to prepare production planning and control activities such as time study, work sampling and method study.
C411.3	Understand the concepts of process planning activities for various products.
C411.4	Understand the scheduling processes and various techniques are used in manufacturing and service industries to plan production and control inventory.
C411.5	Able to plan manufacturing requirement planning and enterprise resource planning.

Advanced I.C. Engines : C412	
C412.1	Distinguish the various stages of combustion and its characteristics in SI engine
C412.2	Explain the P-ϕ and combustion chamber type in CI engine
C412.3	Discuss the engine emission measurement and control
C412.4	Predict possible alternate sources of energy for IC Engines
C412.5	Able to compare the operations of different recent engines

Project Work: C413	
C413.1	Competence in fundamental and advance knowledge of mechanical equipments.
C413.2	Graduates will be able to identify and define problems in the area of Mechanical field.
C413.3	Graduates will be able to explain and illustrate their practical skills needed to understand and modify problems related to manufacturing and designing.
C413.4	Graduates will get a chance to apply current technologies , create tools and solve problems.
C413.5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills.