



## Department of Civil

### COURSE OUTCOMES

#### THIRD YEAR- REGULATION2013

COURSE CODE	ME6501	COURSE NAME	COMPUTER AIDED DESIGN	SEM	5
On completion of the course, the students will be able to					
C 301.1	Acquire the knowledge about fundamentals of Computer Graphics and Manufacturing concepts in Engineering				
C 301.2	Apply the knowledge of modelling techniques like Wireframe, Surface and Solid Modelling in Engineering Applications				
C 301.3	Render and Animate the components by applying Line, Surface and Solid removal Algorithms				
C 301.4	Understand and apply Assembly techniques, interference checking and calculating mass properties of the components while drafting and simulating a model				
C 301.5	Apply Interchange of CAD documents effectively between cad software's using various standards				

COURSE CODE	ME 6502	COURSE NAME	HEAT AND MASS TRANSFER	SEM	5
On completion of the course, the students will be able to					
C 302.1	Know basic fundamentals, concepts and applications of steady state and unsteady heat transfer associated with conductive heat transfer mechanism				
C 302.2	Analyze forced and free convective heat transfer and its applications on various systems				



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<b>C 302.3</b>	Understand the concept of mechanism of phase change heat transfer and its applications in boiling and condensation and analysis with design of heat exchangers
<b>C 302.4</b>	Understand the fundamentals and concept of Radiative heat transfer
<b>C 302.5</b>	Remember the basics of mass transfer and its applications

<b>COURSE CODE</b>	<b>ME6503</b>	<b>COURSE NAME</b>	<b>DESIGN OF MACHINE ELEMENTS</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 303.1</b>	Explain the factors that influence machine design, calculate stresses induced by different types of loading and design components that meet the specified requirement of the society with due consideration to safety.				
<b>C 303.2</b>	Design shaft and coupling by applying the knowledge of fundamental engineering using standard data that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.3</b>	Design temporary and permanent joints using standard data that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.4</b>	Design energy storing elements such as springs, flywheels and energy transmission devices such as connecting rod and crank shaft that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.5</b>	Design journal bearings and select rolling contact bearings that meets the specific requirement of the society with due consideration to safety.				

<b>COURSE CODE</b>	<b>ME6504</b>	<b>COURSE NAME</b>	<b>METROLOGY AND MEASUREMENTS</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					



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<b>C 304.1</b>	Know the concepts of generalized measurement systems
<b>C 304.2</b>	Perform the linear and angular measurements and able to interpret the results
<b>C 304.3</b>	Measure the different profile parameters and also able to demonstrate the methods of measurements.
<b>C 304.4</b>	Comprehend the advancements in metrology includes LASER and Coordinate measuring machine in the engineering applications.
<b>C 304.5</b>	Illustrate the measurement of mechanical properties like force, torque, power, flow, pressure and temperature.

<b>COURSE CODE</b>	<b>ME 6505</b>	<b>COURSE NAME</b>	<b>DYNAMICS OF MACHINES</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 305.1</b>	Understand the concept of Force and Inertia force analysis and gain the knowledge of effect of different forces on bearings, crankshafts, flywheel, Punching Press etc.,				
<b>C 305.2</b>	Acquire the knowledge of performing static and dynamic balancing of rotating and reciprocating masses in different types of engines and various machines				
<b>C 305.3</b>	Understand the basics of vibration, different types of vibration, frequencies, critical speed etc.,				
<b>C 305.4</b>	Gain knowledge about forced vibration due to periodic and harmonic disturbances and their effects in systems, vibration isolation and transmissibility effects.				
<b>C 305.5</b>	Understand the basic functioning of various types of governors with their characteristics, applications, gyroscopic effect on automobile, aircrafts and ships				

<b>COURSE CODE</b>	<b>GE6075</b>	<b>COURSE NAME</b>	<b>PROFESSIONAL ETHICS IN ENGINEERING</b>	<b>SEM</b>	<b>5</b>
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On completion of the course, the students will be able to					
<b>C 306.1</b>	To apply the knowledge of ethics to impart human values including social, public health and safety aspects in engineering				
<b>C 306.2</b>	Analyze various moral issues in the engineering field and arrive at meaningful conclusions involving meaningful inferences				
<b>C 306.3</b>	Design an engineering component or process to meet desired needs considering public health safety, in addition to the cultural, societal and environmental considerations by conducting experimental investigations.				
<b>C 306.4</b>	Students will be able to understand the concept of Safety & Risk and their assessment in the working environment, utilization of resources appropriately to reduce risk along with the knowledge of employee rights, occupational crime and Intellectual Property Rights				
<b>C 306.5</b>	Develop sustainable solutions and understand global level ethical issues including environmental, computer and weapons development.				
<b>COURSE CODE</b>	<b>ME6511</b>	<b>COURSE NAME</b>	<b>DYNAMICS LABORATORY</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 307.1</b>	Apply the concepts of kinematics and dynamics of machinery, such as determination of radius of gyration, Moment of Inertia, governor characteristics				
<b>C 307.2</b>	Calculate the unbalanced forces causing for vibration through the balancing masses experiments				
<b>C 307.3</b>	Analyze the various parameters involved in different vibratory systems				
<b>COURSE CODE</b>	<b>ME6512</b>	<b>COURSE NAME</b>	<b>THERMAL ENGINEERING LABORATORY-II</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					



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<b>C 308.1</b>	Exhibit the fundamentals of different modes of heat transfer
<b>C 308.2</b>	Evaluate the heat transfer coefficient used in the particular heat transfer application
<b>C 308.3</b>	Analyze the fundamentals of refrigeration and air conditioning cycles and determine the coefficient of performance

<b>COURSE CODE</b>	<b>ME 6513</b>	<b>COURSE NAME</b>	<b>METROLOGY AND MEASUREMENTS LABORATORY</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 309.1</b>	Understand the various linear and angular measurements using measurants like comparator, sine bar, floating carriage micrometer etc.				
<b>C 309.2</b>	Educate students regarding inspection of various profiles of small mechanical components using light illumination devices.				
<b>C 309.3</b>	Develop the knowledge on measuring various physical and dynamic properties like Tolerance, force and temperature using LVDT, Load cell and Thermocouples				

<b>COURSE CODE</b>	<b>ME6601</b>	<b>COURSE NAME</b>	<b>DESIGN OF TRANSMISSION SYSTEMS</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 310.1</b>	Apply the knowledge of engineering fundamentals to analyze and design simple transmission elements like belt drive, chain drive and rope drives that meet the specified requirement of the society with due consideration to safety and environmental aspects.				
<b>C 310.2</b>	Design direct transmission elements like spur and helical gears by taking into account dynamic effect using standard data that meets the specific requirement of the society with due consideration to safety.				



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<b>C 310.3</b>	Design advance type of gears like worm gear, bevel gear and cross helical gear by considering factors like thermal effect on materials, efficiency of gear etc, using standard data that meets the specific requirement of the society with due consideration to safety.
<b>C 310.4</b>	Design multi speed gear box for machine tool and automotive applications using standard data that meets the specific requirement of the society with due consideration to safety and environmental aspects.
<b>C 310.5</b>	Design different types of cams, clutches and brakes by considering various aspects like pressure angle, surface forces etc, that meets the specific requirement of the society with due consideration to safety and environmental aspects

<b>COURSE CODE</b>	<b>MG6851</b>	<b>COURSE NAME</b>	<b>PRINCIPLES OF MANAGEMENT</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 311.1</b>	Define and evaluation the management concepts, Organization environmental factors and types of business organizations to adopt themselves in future roles				
<b>C 311.2</b>	Understand planning, nature of planning, tools used for planning, Management By Objectives (MBO), Strategies and Policies				
<b>C 311.3</b>	Discuss about organisation, decentralisation of authority and human resource management				
<b>C 311.4</b>	Develop leadership capabilities by learning, motivation, group behavior and communication Managing cultural diversity				
<b>C 311.5</b>	Understand the concepts of budgetary control and also the role of computers in the working environment.				

<b>COURSE CODE</b>	<b>ME6602</b>	<b>COURSE NAME</b>	<b>AUTOMOBILE ENGINEERING</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					



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<b>C 312.1</b>	Understand the basic layout, construction and types of automobiles and also about the functions, working and materials used for various engines components.
<b>C 312.2</b>	Acquire the knowledge on electronically controlled SI and CI injection and ignition system and also about the vehicle emissions, norms and the controlling mechanism.
<b>C 312.3</b>	Understand the fundamental working principle and types of various transmission systems like clutch, gear box, universal joints etc.
<b>C 312.4</b>	Understand the basics working principle, construction and types of control systems like suspension, brake and steering.
<b>C 312.5</b>	Acquire knowledge on alternative energy sources like CNG, LPG, Bio-diesel, hybrid vehicles etc and the suitable modifications to be done on SI and CI engine to achieve the best performance

<b>COURSE CODE</b>	<b>ME 6603</b>	<b>COURSE NAME</b>	<b>FINITE ELEMENT ANALYSIS</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 313.1</b>	Understand the knowledge of mathematical modelling and engineering fundamentals to solve complex engineering problems by finite element methods				
<b>C 313.2</b>	Analyse the one dimensional elements involving solid mechanics, heat transfer and vibration problems				
<b>C 313.3</b>	Interpret the complex two dimensional elements for computing torsion and higher order element problems				
<b>C 313.4</b>	Compute the two dimensional vector variable problems for axisymmetric, plate and shell elements				
<b>C 313.5</b>	Evaluate the solution of for isoparametric elements and also to learn basics of Ansys software				

<b>COURSE CODE</b>	<b>ME6604</b>	<b>COURSE NAME</b>	<b>GAS DYNAMICS AND JET PROPULSION</b>	<b>SEM</b>	<b>6</b>
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On completion of the course, the students will be able to	
<b>C 314.1</b>	Understand basic concepts of compressible flow viz.a.viz; incompressible flow, effect of Mach Number, Mach cone and isentropic flow are the outcome in this section.. Students learn the use of convergent divergent nozzle which can result in supersonic velocity, the most essential feature of rocket propulsion.
<b>C 314.2</b>	Know the Effect of friction and heat transfer in high velocity flow is taught in this section. Apart from Rocket propulsion, this learning has more application like gas pipeline in Bombay high to Gujarat coast.
<b>C 314.3</b>	Know the High velocity flow results in unavoidable development of shock. Section on shock educates students to understand the phenomenon of shock and how to design system to tolerate this shock.
<b>C 314.4</b>	Understand various aspects of jet engine and aircraft propulsion. Fundamental for this unit is covered in earlier semester, and here students apply these two concepts.
<b>C 314.5</b>	Understanding rocket propulsion is aimed in this unit. Outcome of this unit is Performance evaluation of rocket engines and students learn various types of rocket engines in this unit.

<b>COURSE CODE</b>	<b>ME6004</b>	<b>COURSE NAME</b>	<b>UNCONVENTIONAL MACHINING PROCESSES</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 315.1</b>	Identify the distinction between the traditional and non-traditional machining processes, along with their classification. They can also learn to predict the usage of the characteristics to obtain better responses.				
<b>C 315.2</b>	Understand how to employ mechanical energy based processes to remove the unwanted materials during the manufacturing processes.				
<b>C 315.3</b>	Utilize the electrical energy based processes to obtain the desired shape of the material by removing the non-essential materials.				
<b>C 315.4</b>	Get the knowledge on how to use chemical and electro-chemical energy to remove the undesired materials.				
<b>C 315.5</b>	Investigate the usage of heat energy to the material, to remove the unwanted materials				





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COURSE CODE	ME6611	COURSE NAME	C.A.D. / C.A.M. LABORATORY	SEM	6
On completion of the course, the students will be able to					
C 316.1	Create Assembly Models of Machine Components using 3D modeling Softwares.				
C 316.2	Create Manual Part Programming and also visualize the process of Machine Components using CAM packages.				
C 316.3	Create and Evaluate technical drawings using Graphical user interface Tools				

COURSE CODE	ME6612	COURSE NAME	DESIGN AND FABRICATION PROJECT	SEM	6
On completion of the course, the students will be able to					
C 317.1	Conceptualize the societal needs and acquire design ability.				
C 317.2	Manufacture the component/equipment to meet the specific needs of the society with appropriate consideration for public health, safety and environmental context for sustainable development.				
C 317.3	Demonstrate the working of model fabricated by them and write a detailed report on project				

COURSE CODE	GE6674	COURSE NAME	COMMUNICATION AND SOFT SKILLS- LABORATORY BASED	SEM	6
On completion of the course, the students will be able to					
C 318.1	Communicate competently in English with reference to Speaking and Listening and take part in presentations and discussions.				



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<b>C 318.2</b>	Read, write and interpret data effectively and draft cover letters, e-mails, abstracts and summaries of reports efficiently.
<b>C 318.3</b>	Analyze and infer meanings in psychometric tests, competitive exams and International Exams such as IELTS and TOEFL.
<b>C 318.4</b>	Face interviews successfully and be familiar with the skills required for workplace contexts.
<b>C 318.5</b>	Equip the soft skills that strengthen the prospects of success in interviews and competitive exams.



## Department of Computer Science

**SUBJECT CODE: MA6566**

**COURSE CODE: C301**

**SUBJECT NAME: DISCRETE MATHEMATICS**

At the end of the course, the student will be able to

C301.1	: Students have knowledge of the concepts needed to test the logic of a program
C301.2	Be aware of the counting principles
C301.3	Have an understanding in identifying structures on many levels.
C301.4	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
C301.5	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.

**SUBJECT CODE: CS6501**

**COURSE CODE: C302**

**SUBJECT NAME: INTERNET PROGRAMMING**

At the end of the course, the student will be able to

C302.1	Explaining various concept of java and construction of the Java programs.
C302.2	Examine various HTML Concept and Create a basic website using HTML and Cascading Style Sheets.
C302.3	Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
C302.4	Apply rich client presentation using AJAX, Design and implement server side programs using Servlets and JSP.
C302.5	Illustrate various PHP concept and Design and implement simple web page in PHP, and to present data in XML format.



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**SUBJECT CODE: CS6502**

**COURSE CODE: C303**

**SUBJECT NAME: OBJECT ORIENTED ANALYSIS AND DESIGN**

At the end of the course, the student will be able to

C303.1	Explain OOAD concepts and various UML diagrams
C303.2	Illustrate about domain models and conceptual classes
C303.3	Construct projects using UML diagrams and design patterns
C303.4	Select an appropriate design pattern
C303.5	Create code from design and Compare various testing techniques

**SUBJECT CODE: CS6503**

**COURSE CODE: C304**

**SUBJECT NAME: THEORY OF COMPUTATION**

At the end of the course, the student will be able to

C304.1	Outline the concept of Finite Automata and regular Expressions
C304.2	Illustrate the design of CFG for any language set.
C304.3	Design and implement the Push Down Automata model for the given language.
C304.4	Make use of Turing Machine concept to solve simple problems.
C304.5	Examining decidability or undecidability of various problems.



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**SUBJECT CODE: CS6504**

**COURSE CODE: C305**

**SUBJECT NAME: COMPUTER GRAPHICS**

At the end of the course, the student will be able to

C305.1	Explain the various output primitives and graphics systems.
C305.2	Discuss various 2D transformations, viewing and clipping techniques.
C305.3	Explain the 3D objects and projections.
C305.4	Explain basic illumination and colour models.
C305.5	Discuss various animation sequences and graphics realism.

**SUBJECT CODE: CS6511**

**COURSE CODE: C306**

**SUBJECT NAME: CASE TOOLS LABORATORY**

At the end of the course, the student will be able to

C306.1	Perform OO Analysis and Design for a given problem specification
C306.2	Identify and map basic software requirements using UML diagrams
C306.3	Apply appropriate design patterns to improve the software quality.
C306.4	Create code from design
C306.5	Test the compliance of software with SRS

**SUBJECT CODE: CS6512**

**COURSE CODE: C307**

**SUBJECT NAME: INTERNET PROGRAMMING LABORATORY**

At the end of the course, the student will be able to

C307.1	Illustrate web pages using HTML/XML and style sheets
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C307.2	Analyze user interfaces using Java frames and applets
C307.3	Compare and contrast dynamic web pages using server side scripting
C307.4	Develop a Client Server application and use the frameworks JSP Strut, Spring
C307.5	Build the applications using AJAX

**SUBJECT CODE: CS6513**

**COURSE CODE: C308**

**SUBJECT NAME: COMPUTER GRAPHICS LABORATORY**

At the end of the course, the student will be able to

C308.1	Make use of algorithms to draw 2D and 3D objects
C308.2	Show transformations and projections for 2D and 3D objects
C308.3	Manipulate a graphical object using clipping algorithms and viewing technique
C308.4	Use an image editing tool for image manipulation and enhancement
C308.5	Utilize the authoring tool to develop a 3D scene and to perform 2D animation

**SUBJECT CODE: CS6601**

**COURSE CODE :C309**

**SUBJECT NAME: DISTRIBUTED SYSTEMS**

At the end of the course, the student will be able to

C309.1	Understanding the Challenges and Approaches in Distributed Systems.
C309.2	Applying network virtualization, remote method invocation and objects.
C309.3	Design of distributed file systems.Understand the naming convention in distributed systems.
C309.4	Understand more about the synchronization of distributed systems.Apply locks and concurrency control in distributed systems.
C309.5	Acquire Knowledge about process migration and resource management systems.



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**SUBJECT CODE: IT6601**

**COURSE CODE:C310**

**SUBJECT NAME: MOBILE COMPUTING**

At the end of the course, the student will be able to

C310.1	Understand the basics of Mobile Computing and MAC protocol.
C310.2	Recognize The need of Mobile Internet Protocol and Transport Layer Protocol.
C310.3	Demonstrating the various architectures of Mobile Telecommunication System.
C310.4	Compare various routing protocols in Mobile Ad-hoc networks.
C310.5	Analyzing the features of various Mobile Operating Systems to develop mobile application.

**SUBJECT CODE: CS6660**

**COURSE CODE: C311**

**SUBJECT NAME: COMPILER DESIGN**

At the end of the course, the student will be able to

C311.1	To make use of the different compiler construction tools
C311.2	Design token recognizer using modern tools
C311.3	Design Top-down and Bottom-up parsing Techniques
C311.4	Design and implement a prototype compiler
C311.5	Propose the various optimization techniques

**SUBJECT CODE: IT6502**

**COURSE CODE: C312**

**SUBJECT NAME: DIGITAL SIGNAL PROCESSING**

At the end of the course, the student will be able to

C312.1	To have an overview of signals and systems
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C312.2	To study DFT and FFT
C312.3	To Study the design of IIR filters
C312.4	To Study the design of IIR filters
C312.5	To study the application of DSP.

**SUBJECT CODE: CS6659**

**COURSE CODE: C313**

**SUBJECT NAME: ARTIFICIAL INTELLIGENCE**

At the end of the course, the student will be able to

C313.1	Identify problems that are amenable to solution by AI methods
C313.2	Illustrate AI methods to solve a given problem in representation of knowledge
C313.3	Formalize a given problem in the language/framework of different AI methods.
C313.4	Analyze and implement basic AI algorithms to solve a given problem in planning and machine learning by AI methods.
C313.5	Design and carry out an empirical evaluation of different algorithms on a problem formalization, and state the conclusions that the evaluation supports

**SUBJECT CODE: GE6757**

**COURSE CODE: C314**

**SUBJECT NAME: TOTAL QUALITY MANAGEMENT**

At the end of the course, the student will be able to

C314.1	Outline the Dimensions and Barriers regarding with Quality
C314.2	Illustrate the TQM Principles
C314.3	Demonstrate Tools utilization for Quality improvement
C314.4	Explain the various types of Techniques are used to measure Quality.





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C314.5	Apply various Quality Systems and Auditing on implementation of TQM.
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**SUBJECT CODE: CS6611**

**COURSE CODE: C315**

**SUBJECT NAME: MOBILE APPLICATION DEVELOPMENT LABORATORY**

At the end of the course, the student will be able to

C315.1	Understanding the components and structure of mobile application development for android and windows OS.
C315.2	Solve the issues of mobile application development frameworks.
C315.3	Analyze the capabilities and limitations of mobile devices
C315.4	Design and Implement various mobile applications using emulators.
C315.5	Develop new applications for hand held devices

**SUBJECT CODE: CS6612**

**COURSE CODE: C316**

**SUBJECT NAME: COMPILER LABORATORY**

At the end of the course, the student will be able to

C316.1	To Apply the different Phases of compiler using compiler writing tools
C316.2	Analyze the control flow and data flow of a typical program
C316.3	To make use of simple optimization techniques
C316.4	Optimize a given program to construct an optimized program
C316.5	To build an assembly language program equivalent to a source language program

**SUBJECT CODE: GE6674**

**COURSE CODE: C317**

**SUBJECT NAME: COMMUNICATION AND SOFT SKILLS - LABORATORY**

At the end of the course, the student will be able to



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C317.1	Equip themselves with effective speaking and listening skills
C317.2	Develop their soft skills and interpersonal skills which will help them excel in their jobs
C317.3	Enhance the performance at placement interviews, Group Discussion and other recruitment
C317.4	Prepare themselves to adapt with ease to the industry environment
C317-5	To prepare the students for competitive examinations IELTS and TOEFL



## Department of Electronics and Communication Engineering

Semester : 05	Course code : C301	EC6501–Digital Communication
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### COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C301.1</b>	Apply the principles of sampling & quantization.
<b>C301.2</b>	Study the various waveform coding schemes.
<b>C301.3</b>	Learn and evaluate the various baseband transmission schemes.
<b>C301.4</b>	Understand the various Band pass signaling schemes.
<b>C301.5</b>	Analyze the fundamentals of channel coding.

Semester : 05	Course code : C302	<b>EC6502 - PRINCIPLE OF DIGITAL SIGNAL PROCESSING</b>
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### COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C302.1</b>	Apply DFT for the analysis of Signals and Systems.
<b>C302.2</b>	Design of IIR filter.
<b>C302.3</b>	Design of FIR filter.
<b>C302.4</b>	Characterize finite word length effects on filters.
<b>C302.5</b>	Design the Multirate filters and apply adaptive filters to equalization.



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<b>Semester : 05</b>	<b>Course code : C303</b>	<b>EC6503- Transmission Lines and Wave guides</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C303.1</b>	Examine the characteristics of transmission lines and its losses
<b>C303.2</b>	Illustrate the standing wave ratio and input impedance in high frequency transmission lines
<b>C303.3</b>	Solve impedance matching by stubs using smith charts
<b>C303.4</b>	Analyze symmetrical networks and design filter circuits
<b>C303.5</b>	Investigate the characteristics of TE and TM waves

<b>Semester : 05</b>	<b>Course code : C304</b>	<b>GE6351 - ENVIRONMENTAL SCIENCE AND ENGINEERING</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C304.1</b>	Obtain knowledge about environment, ecosystems and biodiversity.
<b>C304.2</b>	Take control measures of environmental pollution.
<b>C304.3</b>	Gain knowledge about natural resources and energy sources.
<b>C304.4</b>	Find and implement scientific, technological, economic and political solutions to environmental problems.
<b>C304.5</b>	Understand the impact of environment on human population.



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<b>Semester : 05</b>	<b>Course code : C305</b>	<b>EC6504-Microprocessor and Microcontrollers</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C305.1</b>	Describe architecture and operations of a microprocessor & Microcontroller system in depth.
<b>C305.2</b>	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the microprocessor and analyze, specify, design, write and test assembly language programs of moderate complexity.
<b>C305.3</b>	Perform the detailed hardware design of a microprocessor & microcontroller system, and program the microprocessor using suitable techniques and software tools.
<b>C305.4</b>	Design electrical circuitry to the Microprocessor & Microcontroller I/O ports in order to interface the processor to external devices.
<b>C305.5</b>	Design and Implementation of electronic system using appropriate microprocessor/Microcontroller, programming, Interfacing and troubleshooting techniques.

<b>Semester : 05</b>	<b>Course code : C306</b>	<b>EC 6511 - DIGITAL SIGNAL PROCESSING LABORATORY</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C306.1</b>	Carry out simulation of DSP systems
<b>C306.2</b>	Demonstrate their abilities towards DSP processor based implementation of DSP systems
<b>C306.3</b>	Analyze Finite word length effects on DSP systems
<b>C306.4</b>	Demonstrate the applications of FFT to DSP
<b>C306.5</b>	Implement adaptive filters for various applications of DSP



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<b>Semester : 05</b>	<b>Course code : C307</b>	<b>EC6512 – Communication System lab</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C307.1</b>	To Simulate end to end communication link
<b>C307.2</b>	To demonstrate their knowledge in base band transmission schemes
<b>C307.3</b>	To apply various channel coding schemes
<b>C307.4</b>	To demonstrate the improvement of Noise performance.
<b>C307.5</b>	To simulate and validate the various functional modulus of communication system

<b>Semester : 05</b>	<b>Course code : C308</b>	<b>EC6513– MICROPROCESSOR AND MICROCONTROLLER LAB</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C308.1</b>	Write and execute programmes for fixed and floating point arithmetic and floating point operations.
<b>C308.2</b>	Check I/O with processor of details like time delay, passwords, interface traffic light control and stepper motor
<b>C308.3</b>	The students will be able to generate waveforms through software with A/D & D/A interface.
<b>C308.4</b>	The students will apply arithmetic , logical operations ,square and cube programs through 8051 kits and MASM.
<b>C308.5</b>	The students will be able to unpack BCD to ASCII and use MASM software to stimulate and emulate.



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<b>Semester : 06</b>	<b>Course code : C309</b>	<b>MG6811- PRINCIPLES OF MANAGEMENT</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C309.1</b>	Have clear understanding on managerial concepts.
<b>C309.2</b>	Ability to Manage functions like planning on international aspect of management.
<b>C309.3</b>	Ability to understand basic knowledge about organizing, staffing on international aspect of management.
<b>C309.4</b>	Ability to understand knowledge on leading in international aspect of management.
<b>C309.5</b>	Ability to understand directing and controlling on international aspect of management.

<b>Semester : 06</b>	<b>Course code : C 310</b>	<b>CS 6303 - COMPUTER ARCHITECTURE</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C310.1</b>	Use various metrics to calculate the performance of a computer system and Identify the addressing mode of instructions.
<b>C310.2</b>	Demonstrate how to add, subtract, multiply and divide integers and floating-point numbers using two's complement and IEEE floating point representation.
<b>C310.3</b>	Determine which hardware blocks and control lines are used for specific instructions and Detect pipeline hazards and identify possible solutions to those hazards.
<b>C310.4</b>	Classify the various types of parallel processing techniques and show how multi threading techniques improves the speed of operation of a computer.



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<b>C310.5</b>	Categorize memory organization and explain the function of each element of a memory hierarchy and Show how cache design parameters affect cache hit rate and Map a virtual address into a physical address.
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<b>Semester : 06</b>	<b>Course code : C311</b>	<b>CS6551- COMPUTER NETWORKS</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C311.1</b>	Identify and perceive the components required to build the types of computer networks.
<b>C311.2</b>	Analyze the required functionality at each layer for given application.
<b>C311.3</b>	Perceive the solution for each functionality at each layer.
<b>C311.4</b>	Trace the flow of information from one node to another node in the network.
<b>C115.5</b>	Apply the ideas learnt in developing a computer network.

<b>Semester : 06</b>	<b>Course code : C312</b>	<b>EC6601-VLSI DESIGN</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C312.1</b>	Explain the Principle of MOS Transistors and for a given CMOS Circuits, they can apply Layout Design Rules and Draw the Layout Diagram.
<b>C312.2</b>	Design Simple Combinational Static & Dynamic CMOS Circuits.
<b>C312.3</b>	Analyze simple sequential circuits.
<b>C312.4</b>	Build basic arithmetic building blocks.





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<b>C312.5</b>	Develop different implementation strategic.
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<b>Semester : 06</b>	<b>Course code : C313</b>	<b>EC6602- ANTENNA AND WAVE PROPAGATION</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C313.1</b>	Explore various types of antennas and wave propagation.
<b>C313.2</b>	Compute the radiation from a current element.
<b>C313.3</b>	Analyze and study the antenna arrays, aperture antennas.
<b>C313.4</b>	Analyze special antennas such as frequency independent and broad band antennas.
<b>C313.5</b>	Analyze and explore antenna measurement techniques.

<b>Semester : 06</b>	<b>Course code : C314</b>	<b>EC6001 - Medical Electronics</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C314.1</b>	Discuss the application of electronics in diagnostic and therapeutic area.
<b>C314.2</b>	Explain various biochemical and physiological information.
<b>C314.3</b>	Describe the working of units which will help to restore normal functioning.
<b>C314.4</b>	Analyze the typical waveforms and signal characteristics to identify recent trends in medicine.
<b>C314.5</b>	Explore recent researches in Bio-telemetry, LASER and Cryogenics.

<b>Semester : 06</b>	<b>Course code : C315</b>	<b>EC6002- ADVANCED DIGITAL SIGNAL PROCESSING</b>
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## COURSE OUTCOMES (CO)



Upon completion of the course, the students will be able to

<b>C315.1</b>	Inspect and explore in Random process techniques like power spectral density, auto correlation and auto covariance.
<b>C315.2</b>	Examine the parametric methods for power spectrum estimation.
<b>C315.3</b>	Employ adaptive filtering techniques using LMS algorithm and to study the applications of adaptive filtering.
<b>C315.4</b>	Recognize the linear estimation and prediction techniques like Weiner filter and Kalman filter.
<b>C315.5</b>	Describe the advanced transform techniques like wavelet transforms.

<b>Semester : 06</b>	<b>Course code : C316</b>	<b>EC2022 - Operating Systems</b>
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### **COURSE OUTCOMES (CO)**

Upon completion of the course, the students will be able to

<b>C316.1</b>	Explain the basics of Operating system and its working.
<b>C316.2</b>	Design the scheduling algorithms for processes, threads and CPU, applying the principles of concurrency.
<b>C316.3</b>	Analyse the performance of various page replacement algorithms.
<b>C316.4</b>	Design and implement a prototype file system.
<b>C316.5</b>	Perform administrative tasks on Linux Servers.

<b>Semester : 06</b>	<b>Course code : C317</b>	<b>EC6003 - ROBOTICS AND AUTOMATION</b>
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### **COURSE OUTCOMES (CO)**

Upon completion of the course, the students will be able to

<b>C317.1</b>	Explain the basic concepts of working of robot and its design.
<b>C317.2</b>	Analyze the function of power sources and sensors in the robot.
<b>C317.3</b>	Infer the concepts of Manipulators, Actuators and Grippers.
<b>C317.4</b>	Utilize the various path planning techniques in robot programming.



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<b>C317.5</b>	Classify the industrial robots in various applications.
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<b>Semester : 06</b>	<b>Course code : C318</b>	<b>EC6611 – Computer Networks Lab</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C318.1</b>	Communicate between two desktop computers.
<b>C318.2</b>	Implement different Protocols such as Stop & Wait, Go back N/Sliding window , Selective repeat, CSMA/CD & CSMA/CA.
<b>C318.3</b>	Program using Sockets –Client server model, Echo/Ping/Talk commands.
<b>C318.4</b>	Implement and compare Distance vector and Link state routing algorithms & congestion control algorithm.
<b>C318.5</b>	Use simulation tool such as NS2/OPNET.

<b>Semester : 06</b>	<b>Course code : C319</b>	<b>EC6612 - VLSI DESIGN LAB</b>
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## COURSE OUTCOMES (CO)

Upon completion of the course, the students will be able to

<b>C319.1</b>	Write HDL code for basic as well as advanced digital integrated circuits
<b>C319.2</b>	Develop and import the logic modules into FPGA Boards
<b>C319.3</b>	Synthesize the digital ICs and based on the synthesis done, Identification of critical paths and power consumption can be analysed.
<b>C319.4</b>	Create the place and route design of digital ICs
<b>C319.5</b>	Design, simulate and extract the layouts of Analog IC Blocks using EDA tools



## Department of Electrical and Electronics Engineering

### SEMESTER 5

#### EE6501- POWER SYSTEM ANALYSIS

C301.1 (CO1)	Model the power system under steady state operating condition and will be able to draw reactance and impedance diagram and obtain the Y-bus and Z-bus matrices
C301.2 (CO2)	Apply numerical methods to solve the power flow problems using Gauss Seidel and Newton Raphson method
C301.3 (CO3)	Perform Fault analysis for the Balanced faults that occur in the given power system
C301.4 (CO4)	Perform Fault analysis for the unbalanced faults that occur in the given power system
C301.5 (CO5)	Develop knowledge about the classification of Power system Stability and obtain the solution of swing equation by modified Euler method and Runge-Kutta fourth order method

#### EE6502- MICROPROCESSOR AND MICROCONTROLLERS

C302.1	Explain about the blocks in the architecture of Microprocessor 8085 ,memory organization and interrupts in 8085
C302.2	Develop an assembly language programs in the processor 8085 and gain knowledge about subroutine and looping techniques
C302.3	Describe about the architecture of microcontroller 8051, memory organization, data transfer concepts and gain knowledge to develop programs in 8051
C302.4	Discuss about various interfacing devices like 8255,8254,8251,8279,8257 with their internal architecture
C302.5	Analyze the operation of stepper motor, washing machine control, servomotor control and keyboard interfacing by using assembly language program of 8051 controller

#### ME6701- POWER PLANT ENGINEERING

C303.1	Understand the components used in steam power plant
C303.2	Discuss the working of diesel and various gas turbine power plants
C303.3	Know the basics of Nuclear Engineering, Illustrate the nuclear reactors, working of



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	various Nuclear power plants and Safety measures
C303.4	Analyze the working of Hydro and renewable power plants and discusses the economics of power plants.
C303.5	Make a complete comparison about the Site selection criteria, Load Distribution, Tariff, Pollution Control and Waste Disposal for Various Power plants.

## EE6503-POWER ELECTRONICS

C304.1 (CO1)	Characterize the different types semi-conductor devices( such as Diode, SCR, TRIAC, GTO, BJT, MOSFET, IGBT) based on static and dynamic operation.
C304.2 (CO2)	Explain the basic principle of operation about the different types of phase-controlled converters with waveforms by using mathematical equations.
C304.3 (CO3)	Illustrate the operation of various basic topologies of DC-DC switching regulators.
C304.4 (CO4)	Familiar about the different modulation techniques of pulse width modulated inverters and harmonic reduction methods.
C304.5 (CO5)	Discuss the working of various configurations of AC voltage controller and Understand the role of power electronics in industrial application as well as in the development of renewable energy technologies.

## EE 6504 ELECTRICAL MACHINES –II

C305.1 (CO1)	Understand the Construction and performance of salient and non – salient type synchronous generators ,Parallel operation and synchronisation of Alternators
C305.2 (CO2)	Acquire knowledge on Principle of operation and performance characteristics of synchronous motor.
C305.3 (CO3)	Acquire knowledge on Construction, principle of operation and performance characteristics of induction machines.
C305.4	Study of different types of starters and speed control of three-phase induction motors



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(CO4)	and Braking methods
C305.5 (CO5)	Illustrate the starting methods of single phase induction motor with its performance and gain knowledge on various special machines.

## IC6501- CONTROL SYSTEMS

C306.1 (CO1)	To understand the use of transfer function models for analysis physical systems and introduce the control system components.
C306.2 (CO2)	To provide adequate knowledge in the time response of systems and steady state error analysis.
C306.3 (CO3)	To accord basic knowledge in obtaining the open loop and closed-loop frequency responses of systems
C306.4 (CO4)	To introduce stability analysis and design of compensators
C306.5 (CO5)	To introduce state variable representation of physical systems and study the effect of state feedback

## EE6511- CONTROL AND INSTRUMENTATION LABORATORY

C307.1	gain knowledge about P, PI and PID controllers, position control systems, sychros characteristics
C307.2	Analyse the stability of the system and design the lag, lead compensators
307.3	simulate the control systems using MATLAB tools
C307.4	understand the concept of bridges, dynamic characteristics of sensors/transducers
C307.5	demonstrate the Analog to digital converter, signal conditioning and measure the three phase power

## EE6512- ELECTRICAL MACHINES- II LABORTORY



C309.1	Identify different types and parts of synchronous machines as well as induction machines
C309.2	Carry out laboratory experiments on electrical machines and present experiment results in a graphical as well as written report
C309.3	Explain how synchronous induction machines works.
C309.4	Learn the concept of electrical machine parameters and the load characteristics.
C309.5	Determine the regulation of a synchronous machine by using mathematical equation and phasor diagram by conducting EMF, MMF, ZPF and ASA methods.

## Semester- VI

### EE 6601- Solid State drives

C312.1 (CO1)	Acquire the Knowledge of Steady state and dynamic characteristics of drives.
C312.2 (CO2)	Analyze the operation of the converter/Chopper fed DC drives by mathematical equation for continuous and discontinuous mode..
C312.3 (CO3)	Describe the various methods of solid state speed control of induction motor drives.
C312.4 (CO4)	Explain the operation of synchronous motor drives in margin angle control and power factor control.
C312.5 (CO5)	Frame the transfer function for closed loop operation of DC drives using speed and current controller in armature and field weakening mode.

### EE 6602 - EMBEDDED SYSTEMS

#### COURSE CODE – C312

C312.1 (CO1)	Acquire the knowledge of Basic structure of an embedded systems and various embedded development strategies.
C312.2	Explain the working of various bus communication protocols between



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(CO2)	processor and I/O interfacing devices.
C312.3 (CO3)	Summarise the objectives and different phases of EDLC modelling.
C312.4 (CO4)	Outline the various processor's scheduling Algorithm, Task communication, task synchronization process in a Real time
C312.5 (CO5)	Analyze the importance and functions of embedded system in Smart card system, Automotive system and washing machine control

## EE6603 - POWER SYSTEM OPERATION AND CONTROL

C314.1	Analyze the curve fitting techniques with the voltage and frequency control concept and application of load curve and load duration curve
C314.2	Describe and derive the modeling of power frequency dynamics with and without controller
C314.3	Explanation of Compensator for reactive power modeling and derive the transfer function with static and dynamic response
C314.4	Solve the economic dispatch problem and unit commitment problem in power system
C315.5	Explain the need for computer control to energy management using SCADA

## EE6604- DESIGN OF ELECTRICAL MACHINES

C615.1	Understand the concept of mmf calculation and thermal rating of various types of electrical machines
C615.2	Develop the armature and field systems for D.C. Machines.
C615.3	Assemble the core, yoke, windings and cooling systems of transformers
C615.4	Design stator and rotor of induction machines.





C615.5	Invent the stator and rotor of synchronous machines and study their thermal behaviour
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### **EE6002- POWER SYSTEM TRANSIENTS (ELECTIVE-I)**

C616.1 (CO1)	To understand the different types of transients and its impact in power systems
C616.2 (CO2)	To analyze various classes of switching transients by mathematical approach
C616.3 (CO3)	To learn about formation of charge clouds, lightning mechanism, interaction of lightning with power system and its control technique.
C616.4 (CO4)	To derive the travelling wave equation for transmission line and examine the time response with Bewleys lattice diagram.
C616.5 (CO5)	To the study the impact of transients on power systems due to different causes and qualitative analysis using EMTP for computation of transients

### **EE6611-POWER ELECTRONICS AND DRIVES LAB**

C318.1	Understand the working and characteristics of power semiconductor devices
C318.2	Discriminate the working of various power converters (AC-DC, DC-DC and AC-AC) and control parameters
C318.3	Design and simulate Power Electronic circuits using MATLAB
C318.4	Understand the operation and application of inverters and PWM technique
C318.5	Design and develop projects

### **EE6612-MICROPROCESSOR AND MICRO CONTROLLER LABORATORY**

C618.1 (CO1)	To develop the basic simple program in 8085 processor
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C618.2 (CO2)	to understand the concept of interfacing devices with processor
C618.3 (CO3)	To develop the basic simple program in 8051 microcontroller
C618.4 (CO4)	to understand the concept of interfacing devices with controller
C618.5 (CO5)	Able to develop mini projects with processors



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## Department of Electronics and Instrumentation Engineering

**COURSE NAME: EE6502 MICROPROCESSORS AND MICROCONTROLLERS**  
**(III Year –V Semester)**

**COURSE CODE: C301**

<b>C301.1</b>	Students are able to understand the Architecture of uP8085 & uC 8051.
<b>C301.2</b>	Students are able to understand addressing modes, interrupt structure and instruction set and apply computing platform and software of 8085.
<b>C301.3</b>	Students are able to understand peripheral interfacing with uP8085 & 8051.
<b>C301.4</b>	Students are able to understand the addressing modes, Interrupt structure & instruction set of 8051.
<b>C301.5</b>	Students are able to develop skill in simple applications development with programming 8085 & 8051.

**COURSE NAME: IC6501 CONTROL SYSTEMS**  
**(III Year –V Semester)**

**COURSE CODE: C302**

At the end of the course students will be able to:

<b>C302.1</b>	To understand the methods of representation of systems and to derive their transfer function models.
<b>C302.2</b>	To have adequate knowledge in the time response of systems and steady state error analysis.
<b>C302.3</b>	To acquire basic knowledge in obtaining the open loop and closed-loop frequency responses of systems.
<b>C302.4</b>	To understand the concept of stability analysis and designing compensation for a control system.
<b>C302.5</b>	To understand about state variable analysis



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## **COURSE NAME: EE6503 POWER ELECTRONICS (III Year –V Semester)**

### **COURSE CODE: C303**

At the end of the course students will be able :

<b>C303.1</b>	To get an overview of different types of power semiconductor devices and their switching characteristics.
<b>C303.2</b>	To understand the operation, characteristics and performance parameters of controlled rectifiers .
<b>C303.3</b>	To study the operation, switching techniques and basics topologies of DC-DC switching regulators
<b>C303.4</b>	To learn the different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods
<b>C303.5</b>	To study the operation of AC voltage controller and various configurations

## **COURSE NAME: EI6501 ANALYTICAL INSTRUMENTS (III Year –V Semester)**

### **COURSE CODE: C304**

At the end of the course students will be able

<b>C304.1</b>	To understand various techniques of colorimetry and spectrophotometry.
<b>C304.2</b>	To understand the methods of analysis which occur in the various regions of the spectrum, chromatography.
<b>C304.3</b>	To understand about the different methods of analysis of industrial gases and pollution monitoring.
<b>C304.4</b>	To understand about ph meters and dissolved component analyzers.
<b>C304.5</b>	To understand about nuclear magnetic resonance and microscopic techniques.



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**COURSE NAME: EI6502 INDUSTRIAL INSTRUMENTATION –I**  
**III Year –V Semester)**

**CODE COURSE: C305**

<b>C305.1</b>	Students will be able to understand the measurement techniques of force, torque and speed.
<b>C305.2</b>	Students will be able to understand the measurement techniques of acceleration, Vibration and density.
<b>C305.3</b>	Students will be able to understand the pressure measurement techniques.
<b>C305.4</b>	Students will be able to understand the basic temperature measurement techniques.
<b>C305.5</b>	Students will have a sound knowledge about thermocouples and pyrometry techniques.

**COURSE NAME: CS6401 Operating Systems**  
**(III Year –V Semester)**

**CODE COURSE: C306**

<b>C306.1</b>	Students will be able to understand the design various Scheduling algorithms.
<b>C306.2</b>	Students will be able to apply the principles of concurrency.
<b>C306.3</b>	Students will be able to design deadlock, prevention and avoidance algorithms.
<b>C306.4</b>	Students will be able to compare and contrast various memory management schemes
<b>C306.5</b>	Students will be able to design and implement a prototype file systems Perform administrative tasks on Linux Servers.



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## EE6612- Microprocessors and Microcontrollers Laboratory

(III Year –VI Semester) - CODE COURSE: C307

<b>C307.1</b>	Students are able to understand the Architecture of uP8085 &uC 8051.
<b>C307.2</b>	Students are able to understand and apply computing platform and software for engineering problems.
<b>C307.3</b>	Students are able to understand peripheral interfacing with uP8085 &uC 8051.
<b>C307.4</b>	Students are able to understand the addressing modes, Interrupt structure & instruction set of 8085 & 8051.
<b>C307.5</b>	Students are able to develop skill in simple applications development with programming 8085 & 8051 to introduce commonly used peripheral /interfacing

## COURSE NAME: EI6511 Transducers and Measurements Laboratory

(III Year –V Semester) - CODE COURSE: C308

At the end of the course students will be able:

<b>C308.1</b>	To understand the characteristics of a potentiometric transducer, Strain gauge and Load cell, LVDT.
<b>C308.2</b>	To understand the characteristics of Hall effect transducer and Photoelectric tachometer, LDR, thermistor and thermocouple.
<b>C308.3</b>	To understand the Step response characteristic of RTD and thermocouple and smart transducers.
<b>C308.4</b>	To understand the measurement of resistance, capacitance and inductance using bridge circuits.
<b>C308.5</b>	To understand the Calibration of Single-phase Energy meter, wattmeter, ohmmeters, Ammeter and Voltmeter.



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## **COURSE NAME: GE6563 Communication Skills - Laboratory Based (III Year –V Semester)- CODE COURSE: C309**

<b>C309.1</b>	To equip students of engineering and technology with effective reading, speaking and listening skills.
<b>C309.2</b>	To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
<b>C309.3</b>	To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.
<b>C309.4</b>	Students should be able to take IELTS ,TOEFL examination.
<b>C309.5</b>	Students should be able to practice their communicative skills to make them become proficient users of English.

## **COURSE NAME: EI6601 MODERN ELECTRONIC INSTRUMENTATION (III Year –VI Semester) -CODE COURSE: C310**

<b>C310.1</b>	Students are able to introduce different types of electronic voltmeters and their applications.
<b>C310.2</b>	Students are able to have adequate knowledge in various types of cathode ray oscilloscopes, their applications and different types of signal analyzers.
<b>C310.3</b>	Students are able to have adequate knowledge in different types of waveform generators and analyzers and their applications.
<b>C310.4</b>	Students are able to work in virtual instrumentation environment, its applications and DAQ cards modules.
<b>C310.5</b>	Students have exposure to telemetry, modulation techniques and multiplexing techniques



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## **COURSE NAME: EI6602 PROCESS CONTROL (III Year –VI Semester) -CODE COURSE: C311**

<b>C311.1</b>	Students are able to understand the dynamics of various processes
<b>C311.2</b>	Students are able to understand the effect of various control actions
<b>C311.3</b>	Students are able to understand the knowledge on the final control elements
<b>C311.4</b>	Students are able to understand the evaluation criteria and tuning techniques of controllers
<b>C311.5</b>	Students are able to understand the concept of multi loop control techniques

## **COURSE NAME: EI6603 INDUSTRIAL INSTRUMENTATION – II (III Year –VI Semester) -CODE COURSE: C312**

<b>C312.1</b>	To understand about the variable head type flow meters.
<b>C312.2</b>	To understand about the quantity meters , air flow meters and mass flow meter.
<b>C312.3</b>	To understand about the electrical type flow meters.
<b>C312.4</b>	To understand about the level measurement techniques.
<b>C312.5</b>	To understand about the Viscosity, Humidity and Moisture content.





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## **COURSE NAME: EC6651 COMMUNICATION ENGINEERING (III Year –VI Semester)- CODE COURSE: C313**

<b>C313.1</b>	Students are able to understand the different methods of analog communication and their significance.
<b>C313.2</b>	Students are able to understand the Digital Communication methods.
<b>C313.3</b>	Students are able to understand the concepts of source, line coding techniques and about errors in transmission.
<b>C313.4</b>	Students are able to understand about multiple access techniques used in communication systems.
<b>C313.5</b>	Students are able to understand the basics of satellite, optical fiber and SCADA.

## **COURSE NAME: EE6602 EMBEDDED SYSTEMS (III Year –VI Semester)- CODE COURSE: C314**

<b>C314.1</b>	To understand the building Blocks of Embedded System.
<b>C314.2</b>	To understand the architecture of processor, memory organizations and Input/output interfacing.
<b>C314.3</b>	To acquire knowledge in Various processor scheduling algorithms.
<b>C314.4</b>	To understand about RTOS based embedded system design.
<b>C314.5</b>	To understand about few real time embedded system applications.



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**COURSE NAME:** EI6002 Power Plant Instrumentation  
**(III Year –VI Semester) - CODE COURSE: C315**

<b>C315.1</b>	Students are able to understand about power generation through various methods.
<b>C315.2</b>	Students are able to understand about important power plant measurements and Instruments.
<b>C315.3</b>	Students are able to understand about basic boiler control techniques.
<b>C315.4</b>	Students are able to understand about advanced boiler control techniques.
<b>C315.5</b>	Students are able to understand about turbine control techniques.

**COURSE NAME:** EI6611 Industrial Instrumentation Laboratory

**(III Year –VI Semester) -CODE COURSE: C316**

<b>C316.1</b>	To calculate the discharge co-efficient of orifice plate.
<b>C316.2</b>	To perform Torque measurement and Viscosity measurement
<b>C316.3</b>	To perform Level measurement and pressure measurement
<b>C316.4</b>	To find out the absorbance, % of transmittance and concentration for a given test solution using UV and IR spectrophotometer.
<b>C316.5</b>	To perform the measurement of pH values and conductivity of test solutions.



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**COURSE NAME: EI6612 Process Control Laboratory**

**(III Year –VI Semester) -CODE COURSE: C317**

<b>C317.1</b>	Students are able to understand the dynamics of various processes in a controller.
<b>C317.2</b>	Students are able to understand the effect of various control actions involved in a process.
<b>C317.3</b>	Students are able to understand the knowledge on the final control elements in a controller.
<b>C317.4</b>	Students are able to understand the evaluation criteria and tuning techniques of controllers.
<b>C317.5</b>	Students are able to understand the concept of multi loop control techniques.



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## Department of Instrumentation and Control Engineering

**COURSE NAME: EE6502 MICROPROCESSORS AND MICROCONTROLLERS  
(III Year –V Semester)**

**COURSE CODE: C301**

<b>C301.1</b>	Students are able to understand the Architecture of uP8085 & uC 8051.
<b>C301.2</b>	Students are able to understand addressing modes, interrupt structure and instruction set and apply computing platform and software of 8085.
<b>C301.3</b>	Students are able to understand peripheral interfacing with uP8085 & 8051.
<b>C301.4</b>	Students are able to understand the addressing modes, Interrupt structure & instruction set of 8051.
<b>C301.5</b>	Students are able to develop skill in simple applications development with programming 8085 & 8051.

**COURSE NAME: IC6501 CONTROL SYSTEMS  
(III Year –V Semester)**

**COURSE CODE: C302**

At the end of the course students will be able to:

<b>C302.1</b>	To understand the methods of representation of systems and to derive their transfer function models.
<b>C302.2</b>	To have adequate knowledge in the time response of systems and steady state error analysis.



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<b>C302.3</b>	To acquire basic knowledge in obtaining the open loop and closed-loop frequency responses of systems.
<b>C302.4</b>	To understand the concept of stability analysis and designing compensation for a control system.
<b>C302.5</b>	To understand about state variable analysis

## **COURSE NAME: EE6503 POWER ELECTRONICS (III Year –V Semester)**

### **COURSE CODE: C303**

At the end of the course students will be able :

<b>C303.1</b>	To get an overview of different types of power semiconductor devices and their switching characteristics.
<b>C303.2</b>	To understand the operation, characteristics and performance parameters of controlled rectifiers .
<b>C303.3</b>	To study the operation, switching techniques and basics topologies of DC-DC switching regulators
<b>C303.4</b>	To learn the different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods
<b>C303.5</b>	To study the operation of AC voltage controller and various configurations

## **COURSE NAME: EI6501 ANALYTICAL INSTRUMENTS (III Year –V Semester) -COURSE CODE: C304**

At the end of the course students will be able

<b>C304.1</b>	To understand various techniques of colorimetry and spectrophotometry.
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<b>C304.2</b>	To understand the methods of analysis which occur in the various regions of the spectrum, chromatography.
<b>C304.3</b>	To understand about the different methods of analysis of industrial gases and pollution monitoring.
<b>C304.4</b>	To understand about ph meters and dissolved component analyzers.
<b>C304.5</b>	To understand about nuclear magnetic resonance and microscopic techniques.

**COURSE NAME: EI6502 INDUSTRIAL INSTRUMENTATION –I  
III Year –V Semester)**

**CODE COURSE: C305**

<b>C305.1</b>	Students will be able to understand the measurement techniques of force, torque and speed.
<b>C305.2</b>	Students will be able to understand the measurement techniques of acceleration, Vibration and density.
<b>C305.3</b>	Students will be able to understand the pressure measurement techniques.
<b>C305.4</b>	Students will be able to understand the basic temperature measurement techniques.
<b>C305.5</b>	Students will have a sound knowledge about thermocouples and pyrometry techniques.



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## **COURSE NAME: CS6303 COMPUTER ARCHTECTURE (III Year –V Semester)- CODE COURSE: C306**

<b>C306.1</b>	Students will be able to understand the basic structure and operation of digital computer and to understand the hardware software interface.
<b>C306.2</b>	Students will be able to familiarize the concepts of arithmetic and logic unit and implementation of fixed point and floating point arithmetic operations.
<b>C306.3</b>	Students will be able get exposure of concept of pipelining.
<b>C306.4</b>	Students will be able get exposure of concept of parallelism, multithreading and multiprocessors.
<b>C306.5</b>	Students will be able to get exposure about hierarchical memory system including cache memories, virtual memory and different ways of communicating with I/O devices and standard I/O interfaces.

## **EE6612- Microprocessors and Microcontrollers Laboratory**

### **(III Year –V Semester) -CODE COURSE: C307**

<b>C307.1</b>	Students are able to understand the Architecture of uP8085 &uC 8051.
<b>C307.2</b>	Students are able to understand and apply computing platform and software for engineering problems.
<b>C307.3</b>	Students are able to understand peripheral interfacing with uP8085 &uC 8051.
<b>C307.4</b>	Students are able to understand the addressing modes, Interrupt structure & instruction set of 8085 & 8051.
<b>C307.5</b>	Students are able to develop skill in simple applications development with programming 8085 & 8051 to introduce commonly used peripheral /interfacing



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**COURSE NAME: EI6511 Transducers and Measurements Laboratory**

**(III Year –V Semester) - CODE COURSE: C308**

At the end of the course students will be able:

<b>C308.1</b>	To understand the characteristics of a potentiometric transducer, Strain gauge and Load cell, LVDT.
<b>C308.2</b>	To understand the characteristics of Hall effect transducer and Photoelectric tachometer, LDR, thermistor and thermocouple.
<b>C308.3</b>	To understand the Step response characteristic of RTD and thermocouple and smart transducers.
<b>C308.4</b>	To understand the measurement of resistance, capacitance and inductance using bridge circuits.
<b>C308.5</b>	To understand the Calibration of Single-phase Energy meter , wattmeter, ohmmeters, Ammeter and Voltmeter.

**COURSE NAME: GE6563 Communication Skills - Laboratory Based**

**(III Year –V Semester)- CODE COURSE: C309**

<b>C309.1</b>	To equip students of engineering and technology with effective reading, speaking and listening skills.
<b>C309.2</b>	To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.





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<b>C309.3</b>	To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.
<b>C309.4</b>	Students should be able to take IELTS ,TOEFL examination.
<b>C309.5</b>	Students should be able to practice their communicative skills to make them become proficient users of English.

## **COURSE NAME: EI6601 MODERN ELECTRONIC INSTRUMENTATION (III Year –VI Semester) -CODE COURSE: C310**

<b>C310.1</b>	Students are able to introduce different types of electronic voltmeters and their applications.
<b>C310.2</b>	Students are able to have adequate knowledge in various types of cathode ray oscilloscopes, their applications and different types of signal analyzers.
<b>C310.3</b>	Students are able to have adequate knowledge in different types of waveform generators and analyzers and their applications.
<b>C310.4</b>	Students are able to work in virtual instrumentation environment, its applications and DAQ cards modules.
<b>C310.5</b>	Students have exposure to telemetry, modulation techniques and multiplexing techniques

## **COURSE NAME: EI6602 PROCESS CONTROL (III Year –VI Semester)- CODE COURSE: C311**

<b>C311.1</b>	Students are able to understand the dynamics of various processes
<b>C311.2</b>	Students are able to understand the effect of various control actions



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<b>C311.3</b>	Students are able to understand the knowledge on the final control elements
<b>C311.4</b>	Students are able to understand the evaluation criteria and tuning techniques of controllers
<b>C311.5</b>	Students are able to understand the concept of multi loop control techniques

## **COURSE NAME: EI6603 INDUSTRIAL INSTRUMENTATION – II (III Year –VI Semester)- CODE COURSE: C312**

<b>C312.1</b>	To understand about the variable head type flow meters.
<b>C312.2</b>	To understand about the quantity meters , air flow meters and mass flow meter.
<b>C312.3</b>	To understand about the electrical type flow meters.
<b>C312.4</b>	To understand about the level measurement techniques.
<b>C312.5</b>	To understand about the Viscosity, Humidity and Moisture content.

## **COURSE NAME: EC6651 COMMUNICATION ENGINEERING (III Year –VI Semester) -CODE COURSE: C313**

<b>C313.1</b>	Students are able to understand the different methods of analog communication and their significance.
<b>C313.2</b>	Students are able to understand the Digital Communication methods.



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<b>C313.3</b>	Students are able to understand the concepts of source, line coding techniques and about errors in transmission.
<b>C313.4</b>	Students are able to understand about multiple access techniques used in communication systems.
<b>C313.5</b>	Students are able to understand the basics of satellite, optical fiber and SCADA.

**COURSE NAME: IC8651 Advanced Control System**  
**(III Year –VI Semester) -CODE COURSE: C314**

<b>C314.1</b>	Able to design state feedback controller and state observer.
<b>C314.2</b>	Able to understand and analyse linear and nonlinear systems using phase plane method.
<b>C314.3</b>	Able to understand and analyse nonlinear systems using describing function method.
<b>C314.4</b>	Able to understand and design optimal controller.
<b>C314.5</b>	Able to understand optimal estimator including Kalman Filter.
<b>C314.6</b>	Ability to apply advanced control strategies to practical engineering problems.

**COURSE NAME: EI6002 Power Plant Instrumentation**  
**(III Year –VI Semester) - CODE COURSE: C315**



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<b>C315.1</b>	Students are able to understand about power generation through various methods.
<b>C315.2</b>	Students are able to understand about important power plant measurements and Instruments.
<b>C315.3</b>	Students are able to understand about basic boiler control techniques.
<b>C315.4</b>	Students are able to understand about advanced boiler control techniques.
<b>C315.5</b>	Students are able to understand about turbine control techniques.

**COURSE NAME:** EI6611 Industrial Instrumentation Laboratory

**(III Year –VI Semester) - CODE COURSE: C316**

<b>C316.1</b>	To calculate the discharge co-efficient of orifice plate.
<b>C316.2</b>	To perform Torque measurement and Viscosity measurement
<b>C316.3</b>	To perform Level measurement and pressure measurement
<b>C316.4</b>	To find out the absorbance, % of transmittance and concentration for a given test solution using UV and IR spectrophotometer.
<b>C316.5</b>	To perform the measurement of pH values and conductivity of test solutions.



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**COURSE NAME: EI6612 Process Control Laboratory**

**(III Year –VI Semester) - CODE COURSE: C317**

<b>C317.1</b>	Ability to understand and analyze process control engineering problems.
<b>C317.2</b>	Be able to build dynamic models using input – output data of a process
<b>C317.3</b>	Ability to working with real time control loops(flow/level/temperature/pressure)
<b>C317.4</b>	Get exposed to simulation tools such as MATLAB/LABVIEW/ASPEN
<b>C317.5</b>	Ability to learn and implement simple adaptive and model based control schemes



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## Department of Information Technology

**SEMESTER : V**

**Subject Code : CS6551**

**Subject Name : COMPUTER NETWORKS**

Course outcomes	
<b>CO1</b>	Understand the division of network functionalities into layers and link layer service
<b>CO2</b>	Classify the Media Access Control Protocols and different Internetworking
<b>CO3</b>	Explain various types of routing techniques
<b>CO4</b>	Analyze mechanisms involved in transport layer
<b>CO5</b>	Analyze different application layer protocols

**Subject Code : IT6501**

**Subject Name : GRAPHICS AND MULTIMEDIA**

Course outcomes	
<b>CO1</b>	Effectively and Creatively solve 2D graphic design problems
<b>CO2</b>	Effectively and creatively solve 3D graphic design problems.(Shading, Rendering, Color Models and Animation)
<b>CO3</b>	Form Effective and compelling interactive experiences for the wide range of audiences.
<b>CO4</b>	use various software programs used in the creation and implementation of <u>Multimedia</u>
<b>CO5</b>	Discuss issues related to emerging technologies and graphics design

**Subject Code : IT6501**  
**DESIGN**

**Subject Name : OBJECT ORIENTED ANALYSIS AND**

Course outcomes	
<b>CO1</b>	Understand the basics of OO analysis and design skills. Learn to use the UML analysis and design diagrams
<b>CO2</b>	Understand the concept of design patterns .Learn about various types of Design patterns.



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<b>CO3</b>	Design and implement projects using OO concepts Use the UML analysis and design diagrams.
<b>CO4</b>	Apply appropriate design patterns.
<b>CO5</b>	Learn to map design to code Understand to the various testing techniques Create code from design Compare and contrast various testing techniques.

**Subject Code : EC6801**

**Subject Name : WIRELESS COMMUNICATION**

<b>Course outcomes</b>	
<b>CO1</b>	Determine the type and appropriate model of wireless fading channel based on the system parameters and the property of the wireless medium.
<b>CO2</b>	Apply the cellular concepts to evaluate the signal reception performance in a cellular network.
<b>CO3</b>	Study the design of Digital Signaling schemes for fading systems and basics of OFDM
<b>CO4</b>	To study the Equalization and algorithm used for the same.
<b>CO5</b>	Study multiplexing and coding system for MIMO

**Subject Code : IT6503**

**Subject Name : WEB PROGRAMMING**

<b>Course outcomes</b>	
<b>CO1</b>	Build web based application using sockets
<b>CO2</b>	Create databases with connectivity using JDBC
<b>CO3</b>	Apply object oriented aspects to Scripting
<b>CO4</b>	Use technologies of Web Programming
<b>CO5</b>	Design web pages



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**Subject Code : IT6502**

**Subject Name : DIGITAL SIGNAL PROCESSING**

Course outcomes	
<b>CO1</b>	Students are able to classify signals and systems & their mathematical representation.
<b>CO2</b>	Students are able to develop the knowledge about various transformation techniques & their computation.
<b>CO3</b>	Students are able to develop the knowledge about infinite impulse response of the filters and their design for digital implementation
<b>CO4</b>	Students are able to develop the knowledge about finite impulse response of the filters and their design for digital implementation
<b>CO5</b>	Students are able to signal processing concept in systems having more than one sampling frequency and quantization effects.

**Subject Code : IT6511**

**Subject Name : NETWORKS LABRATORY**

Course outcomes	
<b>CO1</b>	To know the basics of socket programming
<b>CO2</b>	To simulate the working of network protocols like TCP
<b>CO3</b>	To simulate the working of network protocols like UDP
<b>CO4</b>	To know the concept of subnetting
<b>CO5</b>	To study the use on ns2 network simulator





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**Subject Code : IT6512**

**Subject Name : WEB PROGRAMMING LABRATORY**

Course outcomes	
CO1	Design Web pages using HTML/DHTML and style sheets
CO2	Design and Implement database applications.
CO3	Create dynamic web pages using server side scripting.
CO4	Write Client Server applications.
CO5	Able to create user interfaces using Java Applets and Frames

**Subject Code : IT6513**

**Subject Name : CASE TOOLS LABRATORY**

Course outcomes	
CO1	Design and implement projects using OO concepts.
CO2	Use the UML analysis and design diagrams
CO3	Apply appropriate design patterns.
CO4	Create code from design
CO5	Compare and contrast various testing techniques

**SEMESTER : VI**

**Subject Code :CS6601**

**Subject Name : DISTRIBUTED SYSTEMS**

Course outcomes	
CO1	To discuss the trends in Distributed Systems
CO2	To apply Network Virtualization
CO3	To apply Remote Method Invocation and Objects
CO4	To understand Transactions and Concurrency control



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<b>CO5</b>	To understand the Design process and Resource management Systems
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**Subject Code : IT6601**

**Subject Name : MOBILE COMPUTING**

<b>Course outcomes</b>	
<b>CO1</b>	Understand the characteristics and structure of mobile computing, mobile computing vs wireless networking and wireless MAC issues.
<b>CO2</b>	Evaluating the key mechanisms and features of Mobile IP and Understand the architecture of TCP/IP and analyze the TCP/IP Performance.
<b>CO3</b>	Understand the various mobile telecommunication systems GSM, GPRS and UMTS.
<b>CO4</b>	Understand the basic concepts of Ad-hoc networks and the various routing protocols of ad-hoc networks.
<b>CO5</b>	To learn and evaluate the various mobile operating systems, M-Commerce and Mobile payment systems.

**Subject Code : CS6660**

**Subject Name : COMPILER DESIGN**

<b>Course outcomes</b>	
<b>CO1</b>	Design a prototype compiler
<b>CO2</b>	Implement various optimization techniques
<b>CO3</b>	Apply and analyse compiler construction tools

**Subject Code : CS6659**

**Subject Name : ARTIFICIAL INTELLIGENCE**

<b>Course outcomes</b>	
<b>CO1</b>	Understand the concepts of Artificial Intelligence and the methods of solving problems
<b>CO2</b>	Represent knowledge for problem solving and game playing using various logics.
<b>CO3</b>	Apply knowledge inferences over production based and frame based system.
<b>CO4</b>	Analyze the concepts of planning and machine learning



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<b>CO5</b>	Understand concepts of Expert Systems with case studies for various applications
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**Subject Code : IT6602**

**Subject Name : SOFTWARE ARCHITECTURES**

<b>Course outcomes</b>	
<b>CO1</b>	Ability to understand the software architectural requirements, drivers and to explain about the influence of software architecture on business and technical activities.
<b>CO2</b>	Able to analyze the quality attribute workshop and to apply the concept to prepare the documentation on quality attribute.
<b>CO3</b>	Ability to understand, identify the key architectural structures and to use the views to specify architecture.
<b>CO4</b>	Ability to use & evaluate the styles to specify architecture.
<b>CO5</b>	Ability to design document for a given architecture.

**Subject Code : IT6611**

**Subject Name : MOBILE APPLICATION DEVELOPMENT  
LABORATORY**

<b>Course outcomes</b>	
<b>CO1</b>	Explain the basics of mobile telecommunication system
<b>CO2</b>	Choose the required functionality at each layer for given application
<b>CO3</b>	Identify solution for each functionality at each layer
<b>CO4</b>	Use simulator tools and design Ad hoc networks
<b>CO5</b>	Develop a mobile application.

**Subject Code : IT6612**

**Subject Name : COMPILER LABORATORY**

<b>Course outcomes</b>	
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<b>CO1</b>	Be exposed to compiler writing tools
<b>CO2</b>	To Implement the different phases of compiler
<b>CO3</b>	Be familiar with control flow analysis
<b>CO4</b>	Be familiar with data flow analysis
<b>CO5</b>	Learn simple optimization techniques

**Subject Code : GE6757**

**Subject Name : TOTAL QUALITY MANAGEMENT**

<b>Course outcomes</b>	
<b>CO1</b>	To give the students an overview of quality and TQM and explaining the salient contributions of Quality Gurus like Deming, Juran and Crosby. General
<b>CO2</b>	The students Will understand the TQM concepts like customer Focus, Employee Focus and their involvement, continuous process improvement and
<b>CO3</b>	Exposure to students on the basic and new seven management tools, Quality concepts like Six sigma, Failure mode effect analysis.
<b>CO4</b>	To explore industrial applications of Quality function deployment, Taguchi quality concepts and TPM.
<b>CO5</b>	Detailed exposure to students on various quality systems like ISO and its standards

**Subject Code : GE6674**  
**SOFT SKILLS LAB**

**Subject Name : COMMUNICATION AND**

<b>Course outcomes</b>	
<b>CO1</b>	Learner will be communicatively competent in English with reference to Speaking and Listening and take part in presentations and discussions.
<b>CO2</b>	Learner shall read, write and interpret data effectively and draft cover letters, e-mails, abstracts and summaries of Reports efficiently.
<b>CO3</b>	Learner should be able to take International Exams such as IELTS and TOEFL.
<b>CO4</b>	Learner should be able to face interviews successfully and shall be familiar with the skills required for workplace contexts.
<b>CO5</b>	Learner shall equip the soft skills that strengthen the prospects of success in Interviews and competitive exams.



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## Department Mechanical Engineering

COURSE CODE	ME6501	COURSE NAME	COMPUTER AIDED DESIGN	SEM	5
On completion of the course, the students will be able to					
C 301.1	Acquire the knowledge about fundamentals of Computer Graphics and Manufacturing concepts in Engineering				
C 301.2	Apply the knowledge of modelling techniques like Wireframe, Surface and Solid Modelling in Engineering Applications				
C 301.3	Render and Animate the components by applying Line, Surface and Solid removal Algorithms				
C 301.4	Understand and apply Assembly techniques, interference checking and calculating mass properties of the components while drafting and simulating a model				
C 301.5	Apply Interchange of CAD documents effectively between cad software's using various standards				

COURSE CODE	ME 6502	COURSE NAME	HEAT AND MASS TRANSFER	SEM	5
On completion of the course, the students will be able to					
C 302.1	Know basic fundamentals, concepts and applications of steady state and unsteady heat transfer associated with conductive heat transfer mechanism				
C 302.2	Analyze forced and free convective heat transfer and its applications on various systems				
C 302.3	Understand the concept of mechanism of phase change heat transfer and its applications in boiling and condensation and analysis with design of heat exchangers				



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<b>C 302.4</b>	Understand the fundamentals and concept of Radiative heat transfer
<b>C 302.5</b>	Remember the basics of mass transfer and its applications

<b>COURSE CODE</b>	<b>ME6503</b>	<b>COURSE NAME</b>	<b>DESIGN OF MACHINE ELEMENTS</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 303.1</b>	Explain the factors that influence machine design, calculate stresses induced by different types of loading and design components that meet the specified requirement of the society with due consideration to safety.				
<b>C 303.2</b>	Design shaft and coupling by applying the knowledge of fundamental engineering using standard data that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.3</b>	Design temporary and permanent joints using standard data that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.4</b>	Design energy storing elements such as springs, flywheels and energy transmission devices such as connecting rod and crank shaft that meets the specific requirement of the society with due consideration to safety.				
<b>C 303.5</b>	Design journal bearings and select rolling contact bearings that meets the specific requirement of the society with due consideration to safety.				

<b>COURSE CODE</b>	<b>ME6504</b>	<b>COURSE NAME</b>	<b>METROLOGY AND MEASUREMENTS</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 304.1</b>	Know the concepts of generalized measurement systems				
<b>C 304.2</b>	Perform the linear and angular measurements and able to interpret the results				



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<b>C 304.3</b>	Measure the different profile parameters and also able to demonstrate the methods of measurements.
<b>C 304.4</b>	Comprehend the advancements in metrology includes LASER and Coordinate measuring machine in the engineering applications.
<b>C 304.5</b>	Illustrate the measurement of mechanical properties like force, torque, power, flow, pressure and temperature.

<b>COURSE CODE</b>	<b>ME 6505</b>	<b>COURSE NAME</b>	<b>DYNAMICS OF MACHINES</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 305.1</b>	Understand the concept of Force and Inertia force analysis and gain the knowledge of effect of different forces on bearings, crankshafts, flywheel, Punching Press etc.,				
<b>C 305.2</b>	Acquire the knowledge of performing static and dynamic balancing of rotating and reciprocating masses in different types of engines and various machines				
<b>C 305.3</b>	Understand the basics of vibration, different types of vibration, frequencies, critical speed etc.,				
<b>C 305.4</b>	Gain knowledge about forced vibration due to periodic and harmonic disturbances and their effects in systems, vibration isolation and transmissibility effects.				
<b>C 305.5</b>	Understand the basic functioning of various types of governors with their characteristics, applications, gyroscopic effect on automobile, aircrafts and ships				

<b>COURSE CODE</b>	<b>GE6075</b>	<b>COURSE NAME</b>	<b>PROFESSIONAL ETHICS IN ENGINEERING</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 306.1</b>	To apply the knowledge of ethics to impart human values including social, public health and safety aspects in engineering				



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<b>C 306.2</b>	Analyze various moral issues in the engineering field and arrive at meaningful conclusions involving meaningful inferences
<b>C 306.3</b>	Design an engineering component or process to meet desired needs considering public health safety, in addition to the cultural, societal and environmental considerations by conducting experimental investigations.
<b>C 306.4</b>	Students will be able to understand the concept of Safety & Risk and their assessment in the working environment, utilization of resources appropriately to reduce risk along with the knowledge of employee rights, occupational crime and Intellectual Property Rights
<b>C 306.5</b>	Develop sustainable solutions and understand global level ethical issues including environmental, computer and weapons development.

<b>COURSE CODE</b>	<b>ME6511</b>	<b>COURSE NAME</b>	<b>DYNAMICS LABORATORY</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 307.1</b>	Apply the concepts of kinematics and dynamics of machinery, such as determination of radius of gyration, Moment of Inertia, governor characteristics				
<b>C 307.2</b>	Calculate the unbalanced forces causing for vibration through the balancing masses experiments				
<b>C 307.3</b>	Analyze the various parameters involved in different vibratory systems				

<b>COURSE CODE</b>	<b>ME6512</b>	<b>COURSE NAME</b>	<b>THERMAL ENGINEERING LABORATORY-II</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 308.1</b>	Exhibit the fundamentals of different modes of heat transfer				





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<b>C 308.2</b>	Evaluate the heat transfer coefficient used in the particular heat transfer application
<b>C 308.3</b>	Analyze the fundamentals of refrigeration and air conditioning cycles and determine the coefficient of performance

<b>COURSE CODE</b>	<b>ME 6513</b>	<b>COURSE NAME</b>	<b>METROLOGY AND MEASUREMENTS LABORATORY</b>	<b>SEM</b>	<b>5</b>
On completion of the course, the students will be able to					
<b>C 309.1</b>	Understand the various linear and angular measurements using measurants like comparator, sine bar, floating carriage micrometer etc.				
<b>C 309.2</b>	Educate students regarding inspection of various profiles of small mechanical components using light illumination devices.				
<b>C 309.3</b>	Develop the knowledge on measuring various physical and dynamic properties like Tolerance, force and temperature using LVDT, Load cell and Thermocouples				

<b>COURSE CODE</b>	<b>ME6601</b>	<b>COURSE NAME</b>	<b>DESIGN OF TRANSMISSION SYSTEMS</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 310.1</b>	Apply the knowledge of engineering fundamentals to analyze and design simple transmission elements like belt drive, chain drive and rope drives that meet the specified requirement of the society with due consideration to safety and environmental aspects.				
<b>C 310.2</b>	Design direct transmission elements like spur and helical gears by taking into account dynamic effect using standard data that meets the specific requirement of the society with due consideration to safety.				
<b>C 310.3</b>	Design advance type of gears like worm gear, bevel gear and cross helical gear by considering factors like thermal effect on materials, efficiency of gear etc, using				



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	standard data that meets the specific requirement of the society with due consideration to safety.
<b>C 310.4</b>	Design multi speed gear box for machine tool and automotive applications using standard data that meets the specific requirement of the society with due consideration to safety and environmental aspects.
<b>C 310.5</b>	Design different types of cams, clutches and brakes by considering various aspects like pressure angle, surface forces etc, that meets the specific requirement of the society with due consideration to safety and environmental aspects

<b>COURSE CODE</b>	<b>MG6851</b>	<b>COURSE NAME</b>	<b>PRINCIPLES OF MANAGEMENT</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 311.1</b>	Define and evaluation the management concepts, Organization environmental factors and types of business organizations to adopt themselves in future roles				
<b>C 311.2</b>	Understand planning, nature of planning, tools used for planning, Management By Objectives (MBO), Strategies and Policies				
<b>C 311.3</b>	Discuss about organisation, decentralisation of authority and human resource management				
<b>C 311.4</b>	Develop leadership capabilities by learning, motivation, group behavior and communication Managing cultural diversity				
<b>C 311.5</b>	Understand the concepts of budgetary control and also the role of computers in the working environment.				

<b>COURSE CODE</b>	<b>ME6602</b>	<b>COURSE NAME</b>	<b>AUTOMOBILE ENGINEERING</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					



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<b>C 312.1</b>	Understand the basic layout, construction and types of automobiles and also about the functions, working and materials used for various engines components.
<b>C 312.2</b>	Acquire the knowledge on electronically controlled SI and CI injection and ignition system and also about the vehicle emissions, norms and the controlling mechanism.
<b>C 312.3</b>	Understand the fundamental working principle and types of various transmission systems like clutch, gear box, universal joints etc.
<b>C 312.4</b>	Understand the basics working principle, construction and types of control systems like suspension, brake and steering.
<b>C 312.5</b>	Acquire knowledge on alternative energy sources like CNG, LPG, Bio-diesel, hybrid vehicles etc and the suitable modifications to be done on SI and CI engine to achieve the best performance

<b>COURSE CODE</b>	<b>ME 6603</b>	<b>COURSE NAME</b>	<b>FINITE ELEMENT ANALYSIS</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 313.1</b>	Understand the knowledge of mathematical modelling and engineering fundamentals to solve complex engineering problems by finite element methods				
<b>C 313.2</b>	Analyse the one dimensional elements involving solid mechanics, heat transfer and vibration problems				
<b>C 313.3</b>	Interpret the complex two dimensional elements for computing torsion and higher order element problems				
<b>C 313.4</b>	Compute the two dimensional vector variable problems for axisymmetric, plate and shell elements				
<b>C 313.5</b>	Evaluate the solution of for isoparametric elements and also to learn basics of Ansys software				



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COURSE CODE	ME6604	COURSE NAME	GAS DYNAMICS AND JET PROPULSION	SEM	6
On completion of the course, the students will be able to					
C 314.1	Understand basic concepts of compressible flow viz.a.viz; incompressible flow, effect of Mach Number, Mach cone and isentropic flow are the outcome in this section.. Students learn the use of convergent divergent nozzle which can result in supersonic velocity, the most essential feature of rocket propulsion.				
C 314.2	Know the Effect of friction and heat transfer in high velocity flow is taught in this section. Apart from Rocket propulsion, this learning has more application like gas pipeline in Bombay high to Gujarat coast.				
C 314.3	Know the High velocity flow results in unavoidable development of shock. Section on shock educates students to understand the phenomenon of shock and how to design system to tolerate this shock.				
C 314.4	Understand various aspects of jet engine and aircraft propulsion. Fundamental for this unit is covered in earlier semester, and here students apply these two concepts.				
C 314.5	Understanding rocket propulsion is aimed in this unit. Outcome of this unit is Performance evaluation of rocket engines and students learn various types of rocket engines in this unit.				

COURSE CODE	ME6004	COURSE NAME	UNCONVENTIONAL MACHINING PROCESSES	SEM	6
On completion of the course, the students will be able to					
C 315.1	Identify the distinction between the traditional and non-traditional machining processes, along with their classification. They can also learn to predict the usage of the characteristics to obtain better responses.				
C 315.2	Understand how to employ mechanical energy based processes to remove the unwanted materials during the manufacturing processes.				
C 315.3	Utilize the electrical energy based processes to obtain the desired shape of the material by removing the non-essential materials.				
C 315.4	Get the knowledge on how to use chemical and electro-chemical energy to remove the undesired materials.				



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<b>C 315.5</b>	Investigate the usage of heat energy to the material, to remove the unwanted materials
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<b>COURSE CODE</b>	<b>ME6611</b>	<b>COURSE NAME</b>	<b>C.A.D. / C.A.M. LABORATORY</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 316.1</b>	Create Assembly Models of Machine Components using 3D modeling Softwares.				
<b>C 316.2</b>	Create Manual Part Programming and also visualize the process of Machine Components using CAM packages.				
<b>C 316.3</b>	Create and Evaluate technical drawings using Graphical user interface Tools				

<b>COURSE CODE</b>	<b>ME6612</b>	<b>COURSE NAME</b>	<b>DESIGN AND FABRICATION PROJECT</b>	<b>SEM</b>	<b>6</b>
On completion of the course, the students will be able to					
<b>C 317.1</b>	Conceptualize the societal needs and acquire design ability.				
<b>C 317.2</b>	Manufacture the component/equipment to meet the specific needs of the society with appropriate consideration for public health, safety and environmental context for sustainable development.				
<b>C 317.3</b>	Demonstrate the working of model fabricated by them and write a detailed report on project				

<b>COURSE CODE</b>	<b>GE6674</b>	<b>COURSE NAME</b>	<b>COMMUNICATION AND SOFT SKILLS- LABORATORY BASED</b>	<b>SEM</b>	<b>6</b>
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On completion of the course, the students will be able to	
<b>C 318.1</b>	Communicate competently in English with reference to Speaking and Listening and take part in presentations and discussions.
<b>C 318.2</b>	Read, write and interpret data effectively and draft cover letters, e-mails, abstracts and summaries of reports efficiently.
<b>C 318.3</b>	Analyze and infer meanings in psychometric tests, competitive exams and International Exams such as IELTS and TOEFL.
<b>C 318.4</b>	Face interviews successfully and be familiar with the skills required for workplace contexts.
<b>C 318.5</b>	Equip the soft skills that strengthen the prospects of success in interviews and competitive exams.



**SRI SAIRAM ENGINEERING COLLEGE**  
**DEPARTEMENT OF PRODUCTION ENGINEERING**  
**COURSE OUTCOMES (CO) – R-2013**

**ODD SEMESTER- V semester**

**GE6351 Environmental Science and Engineering**

**CO1:**Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.

**CO2:**Public awareness of environmental is at infant stage.

**CO3:**Ignorance and incomplete knowledge has lead to misconceptions.

**CO4:**Development and improvement in std. of living has lead to serious environmental disasters.

**PR6501 Engineering Metrology and Measurements**

**CO1:**To explain generalized measuring system, errors, tolerance.

**CO2:**To explain linear and angular measuring instruments.

**CO3:**To study about Thread and gear measurements, surface finish.

**CO4:**To explain CMM and laser interferometer.

**CO5:**To explain the measurements of force, power , torque, pressure, flow,temperature.



## **MF6502 Metal Forming Technology**

**CO1:** Upon completion of this course, the students can able to perform difficult forming process to make different shape components.

**CO2:** Select appropriate manufacturing Processes .

**CO3:** Design different sheet metal working processes.

**CO4:** Demonstrate operation such as Turning, Facing, Threading, Knurling and Grooving on Centre Lathe.

**CO5:** Implement the Knowledge of Gained Subject in Industry.

## **PR6502 Engineering Statistics and Quality Control**

**CO1:** Upon completion of this course, the students can able to perform statistical analysis using different control chart and able to apply concept of reliability, and design of experiment for quality improvement.

**CO2:** An ability to understanding of Quality Control Techniques and its applications in engineering industries.

**CO3:** Student will be able to solve quality control problem using statistical method.

**CO4:** An ability to understand the quality system and the need for a quality system.

**CO5:** Student will be able to perform the job of an inspector and help the industries to produce quality products.

## **PR6503 Machine Elements Design**

**CO1:** Upon completion of this course, the students can able to successfully design engine components. The students can able to successfully design transmission components used in Engine and machines.





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**CO2:** Describe the design process, material selection, calculation of stresses and stress concentrations under variable loading.

**CO3:** Design the solid, hollow shafts and to finding the critical speeds.

**CO4:** Differentiate between rigid and flexible couplings and also the knuckle joints.

**CO5:** Analyze bolted joints in eccentric loading.

**CO6:** Examine the welded joints for vessels and steel structures also have a design knowledge on sliding and rolling contact bearing.

## **PR6504 Foundry Technology**

**CO1:** Upon completion of this course, the students can able to design different casting system and use different Foundry practices to make practical component.

**CO2:** To perform different testing to study the defect in the casting and apply engineering skills to minimise the defects.

## **SRI SAIRAM ENGINEERING COLLEGE**

### **DEPARTMENT OF PRODUCTION ENGINEERING**

#### **COURSE OUTCOMES (CO) – R-2013**

#### **EVEN SEMESTER – VI SEMESTER**

### **IE6605 Production Planning and Control**

**CO1:** Upon completion of this course, the students can able to prepare production planning and control activities, Product design and development



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**CO2:** Prepare production planning and control activities work study and techniques

**CO3:** Prepare production planning and control activities Product planning and process planning

**CO4:** Prepare production planning and control activities production scheduling

**CO5:** They can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP)

## **PR6601 Computer Aided Product Design**

**CO1:** Upon completion of this course, the students can able to apply geometric modeling principles to design a component and also able to manage the product data and apply product life cycle management to industrial components.

**CO2:** Suggest whether the given component is safe or not for the applied loading conditions.

**CO3:** Select suitable manufacturing method for different mechanical components using CAM software.

**CO4:** Implement proper Rapid Prototyping methods for designing particular components.

**CO5:** Select the proper automation and robotic structure for particular system

**CO6:** Students will do Design, A0lysis and Manufacture of different components using different CAD, CAM, and CAE softwarès.

## **PR6602 Automated Production and Computer Integrated Manufacturing**

**CO1:** Ability to group similar parts

**CO2:** Ability to design FMS process

**CO3:** Ability to constituentcontrols that to calculate the amount of script to develop manufacturing plans.



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**CO4:** Ability to combine different concepts to describe computer integrated manufacturing.

## **PR6603 Design of Jigs, Fixture and Press Tools and Drawing**

**CO1:** Upon completion of this course, the students can able to design jigs, fixtures and press tools and drawing.

**CO2:** Design and develop jigs and fixtures for given component

**CO3:** Discuss the press working terminologies and elements of cutting dies

**CO4:** Distinguish between Bending and Drawing dies.

**CO5:** Discuss the different types of forming techniques

## **Elective I**

### **ME6004 UNCONVENTIONAL MACHINING PROCESSES**

**CO1:** Upon completion of this course, the students can able to demonstrate different unconventional machining processes and know the influence of difference process parameter-Student should be able to understand various material processing techniques for critical components.

**CO2:** Student should be able to understand various micro machining processes.

**CO3:** Student should be able to understand selection of latest additive manufacturing processes.

**CO4:** Student should be able to understand and select various measurement techniques in micro machining processes.



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## Elective II

### PR6003 INSTRUMENTATION AND CONTROL

- CO1:** Upon completion of this course student can able to perform measurement of displacement, velocity, force, torque, strain, stress, pressure and temperature.
- CO2:** The students will be able to handle any kind of process by framing it in block diagram, mathematical model and different process variables.
- CO3:** The students will be able to handle different types of controller like electronic, pneumatic and hydraulic.
- CO4:** The students will be able to implement different control schemes to various processes.
- CO5:** The students will be able to design relay logic for various processes.