2016-2017

ELECTRONICS & COMMUNICATION ENGINEERING

ACADEMIC YEAR 2016-2017

S1 ECE (2016 Batch)

Course code	Subject name	Staff handled
MA101	Calculus	**Mr.Arun**
PH100	Engineering Physics	**Ms.Sreeti**
BE10.104	Introduction to Electronics Engineering	**Mr.Prajeesh**
CE100	Basics of Civil Engineering	**Ms.Greeshma**
BE110	Engineering Graphics	**Mr.Sasi**
BE103	Introduction to Sustainable Engineering	**Ms.Neeti**
PH110	Engineering Physics Lab	**Ms.Sreeti**
EC110	Electronics Engineering Workshop	**Ms.Arya**
CE110	Civil Engineering Workshop	**Ms.Greeshma**

S3 ECE (2015 Batch)

Sl no	Course code	Subject name	Staff handled
1	MA 201	Linear Algebra & complex Analysis	**Ms.Jisha**
2	EC201	Network Theory	**Ms.Samitha**
3	EC203	Solid State Devices	**Mr.Prajeesh**
4	EC205	Electronic Circuits	**Mr.Anoop**
5	EC207	Logic Circuit Design	**Ms.Anita**
6	HS200	Business Economics	**Mr.Rajan**
7	EC231	Electronic devices & circuits	**Ms.Arathy**
8	EC233	Electronic Design Automation Lab	**Ms.Samitha**

S5 ECE (2014 Batch)

Sl no	Course code	Subject name	Staff handled
1	13.501	Engineering Mathematics IV - Complex Analysis & Linear Algebra (ABHT)	Ms.Anjana
2	13.502	Engineering Management for Electronics Engineers (AT)	Ms.Ponnambili
3	13.503	Microprocessors & Microcontrollers (AT)	Mr.Ratheesh
4	13.504	Electronic Measurements &	Ms.Sony

		Instrumentation (T)	
5	13.505	Applied Electromagnetic Theory (T)	Mr.Rahul
6	13.506.2	Fuzzy Systems & Applications	Ms.Arya
7	13.507	Communication Engineering Lab (T)	Mr.Sujith
8	13.505	Digital Signal Processing Lab (T)	Ms.Samitha

S7 ECE (2013 Batch)

Sl no	Course code	Subject name	Staff handled
1	13.701	Nanoelectronics (AT)	**Ms.Lekshmi**
2	13.702	Optical Fiber Communications (T)	**Ms.Gopika**
3	13.703	Microwave & Radar Engineering (T)	**Ms.Malu**
4	13.704	Information Theory & Coding (T)	**Ms.Preetha**
5	13.705	Real Time Operating Systems	Mr.Rahul
6	13.706	MEMS (TA)	Mr.Sujith
7	13.707	Microwave & Optical Communications Lab (T)	**Ms.Sony**
8	13.708	Modeling & Simulation of Communication Systems Lab (T)	**Ms.Malu**
9	13.709	Seminar (TA)	**Ms.Preetha**
10	13.710	Project Design (AT)	**Ms.Arathy**

EVEN SEMESTER

S2 ECE (2016 Batch)

Course code	Subject name	Staff handled
MA102	Differential Equations	**Mr.Arun**
CY100	Engineering Chemistry	**Ms.Renju**
BE100	Engineering Mechanics	**Mr.Aravind**
BE102	Design Engineering	**Ms.Thushara**
ME100	Basic Mechanical Engineering	**Mr.Pratheesh**
EE100	Basic Electrical Engineering	**Mr.Smith**
CY110	Engineering Chemistry Lab	**Ms.Remju**
EE110	Basic Electrical Engineering Workshop	**Ms.Sneha**
ME110	Mechanical Engineering Workshop	**Mr.Soman**

S4 ECE (2015 Batch)

Sl no	Course code	Subject name	Staff handled
1	MA204	Probability random process	**Ms.Liji**
2	EC202	Signals And Systems	**Mr.Prajreesh**
3	EC206	Computer Organization	**Mr.Ratheesh**

4	HS210	Business Economics	**Mr.Rajan**
5	EC204	Analog Integrated Circuits	**Ms.Ponnambili**
6	EC208	Analog Communication eNGINEERING	**Ms.Arathy**
7	EC230	Logic Circuit Lab Circuits Lab (T)	**Mr.Anoop**
8	**EC232**	Analog Integrated Circuits Lab (T)	**Mr.Sujith**

S6 ECE (2014 Batch)

Sl no	Course code	Subject name	Staff handled
1	13.601	Image Processing (AT)	Ms.Arya
2	13.602	VLSI Design (T)	Ms.Malu
3	13.603	Control Systems (T)	Ms.Arathy
4	13.604	Digital Communications (T)	Mr.Rahil
5	13.605	Antenna & Wave Propagation (T)	Mr.Sujith
6	13.606.4	Professional Ethics	Dr.Mathew
7	13.607	Microcontroller Lab (T)	Ms.Arathy
8	13.608	Electronic Product Design & Mini Project (AT)	**Ms.Malu**

S8 ECE (2013 Batch)

Sl no	Course code	Subject name	Staff handled
1	13.801	Electrical Drives & Control (T)	Ms.Sneha
2	13.802	Entertainment Electronics Technology (T)	Ms.Preetha
3	13.803	Computer Communications (T)	Ms.Vivitha
4	13.804	Wireless Communications (T)	Ms.Gopika
5		Microwaves Devices And Circuits	Mr.viswajith
6	13.806.2	Biomedical Engineering	Ms.Sony
7	13.807	Project & Viva – Voce	Ms.Arathy

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

MA 101: CALCULUS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give the definition of an infinite series and explain what is meant by the sequence of partial sums. Relate the convergence or divergence of the series to the sequence of partial sums.	Evaluate the limit of a sequence of numbers (infinite series) and determine whether the series converges.
2	Compute partial derivatives of functions of several variables. Apply the theorem on mixed partial derivatives.	Understand the meaning of partial derivatives and calculate partial derivatives.
3	Use concepts of calculus to the model real-world problems	Compute dot product, cross product, length of vectors. Compute partial derivatives, derivatives of vector-valued functions, gradient functions.
4	Evaluate volumes of bounded solids and areas of bounded regions by using the ideas of double and triple integrals.	To change a double integral to polar co ordinate. Compute (relatively simple) triple integrals
5	Apply the concept of line integral to work and circulation. Know the definition and properties of conservative vector fields and their relationship to gradient fields.	Determine if a vector field is conservative and find a potential function if conservative. Evaluate line integrals in the plane and in space, including line integrals of vector fields.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

PH100: ENGINEERING PHYSICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Dynamics of mechanical and electrical oscillation using Fourier series and integrals; time and frequency representations for driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.	Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains. Damped and Forced Oscillations oscillating system problems.
2	The fundamental principles of photonics that complement the topics in the optics and laser courses and to help students develop problem-solving skills applicable to real-world photonics problems.	Define and explain the propagation of light in conducting and non-conducting media.
3	Introduce basic concepts and principles of acoustics.	Define and explain the physics governing laser behaviour and light matter interaction ting and non-conducting media.
4		Apply wave optics and diffraction theory to a range of problems
5		Explain and calculate the physical effects of acoustic reflections, absorption, scattering, diffusion, diffraction, and propagation losses.
6		Use advanced theoretical, numerical, and experimental techniques to model and analyze acoustical elements in musical instruments, the human voice, room acoustics, and audio.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

INTRODUCTION TO ELECTRONICS ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get basic idea about types specifications and common values of passive components.	Students can identify the active and passive components.
2	To familiarize the working and characteristics of diodes,transistors and MOSFETS.	Students can design and setup simple circuits using diodes and transistors.
3	To understand working of diodes in circuits and rectifiers.	Students are able to understand the characteristics of diodes and transistors.
4	To familiarize some measuring instruments.	Voltages and currents can be measured and monitored using electronic measuring instruments.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

ME 102: ENGINEERING GRAPHICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Increase ability to communicate with people.	To hand letter will improve.
2	Learn to sketch and take field dimensions.	To perform basic sketching techniques will improve.
3	Learn to take data and transform it into graphic drawings.	To draw orthographic projections and sections.
4	Learn basic Auto Cad skills.	To use architectural and engineering scales will increase.
5	Learn basic engineering drawing formats	To produce engineered drawings will Improve
6	Prepare the student for future Engineering positions	To convert sketches to engineered drawings will increase.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

CE 100: BASICS OF CIVIL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches	The students will be able to illustrate the fundamental aspects of civil engineering
2	To provide the students an illustration of the significance of the civil engineeringprofessionsatisfying societal needs.	The students should able to plan a building
3		Students will be able to explain about surveying for making horizontal and vertical measurements.
4	.	They will able to illustrate the uses of various building materials and construction of different components of a building.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

BE 103: INTRODUCTION TO SUSTAINABLE ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To have an increased awareness among students on issues in areas of sustainability.**	**Able to appreciate and explain the different types of environmental pollution problems and their sustainable solutions**
2	**To have an insight into global environmental issues.**	**To be aware of problem related to global environmental issues**
3	**To establish a clear understanding of the role and impact of various aspects of engineering and engineering decisions on environmental, societal, and economic problems.**	**Able to apply the concepts of sustainability in their respective area of specialization**
4	**Tounderstandtheroleof engineering in achieving sustainable world**	**To understand the need of waste disposal and management**
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

PH 103 : ENGINEERING PHYSICS LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Competency in an engineering or science profession via promotion to positions of increasing responsibility, publications, and/orconference presentations.	An ability to apply knowledge of mathematics, science, and engineering.
2	Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering or related fields, or participating in professional development and/or industrial training courses.	An ability to design and conduct experiments, as well as to analyze and interpret data.
3		An ability to identify, formulate, and solve engineering problems
4		Understanding of professional and ethical Responsibility
5		The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
6		A recognition of the need for, and an ability to engage in life-long learning

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

EC 110 ELECTRONICS ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To gives the basic introduction of electronic hardware systems.	Students can identify the active and passive electronic components.
2	To provide hands on training with familiarization, testing, assembling.	Students get hands on assembling, dismantling and repairing systems.
3	To develop knowledge of electrical wiring and electronic circuits.	Drawing of electronic circuit diagrams using BIS/ IEEE symbols.
4	To use the various tools and instruments available in the Electronic Workshop.	Testing of electronic components (Resistor, Capacitor, Diode)
5		Assembling of electronic circuit / system on general purpose PCB.
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

CE110 CIVIL ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches.	The ability to practice civil engineering using up-to-date techniques, skills, and tools as a result of life-long learning ability to design and conduct experiments
2	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering.
3	To develop awareness about the instruments used in civil engineering field work.	The students will be able to illustrate the fundamental aspects of civil engineering
4	.	The students should able to plan a building

MA201: LINEAR ALGEBRA & COMPLEX ANALYSIS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**Identify complex-differentiable functions**	**Determine whether a given function is differentiable, analytic and if so find its derivative. To find harmonic conjugate**
2	**Use conformal mapping**	**Upon completion Conformal Mapping students will master concepts and theories of conformal mappings of simply connected and multiply connected domains.**
3	**Compute complex line integrals**	**Find parametrizations of curves, and compute complex line integrals directly. Use antiderivatives to compute line integrals. Use Cauchy's integral theorem and formula to compute line integral. Express complex-differentiable functions as power series.**
4	**Use the residue theorem.**	**Identify the isolated singularities of a function and determine whether they are removable, poles, or essential. Use the residue theorem to compute complex line integrals and real integrals.**
5	**Learn to solve systems of linear equations and application problems requiring them. Learn about and work with vector spaces and subspaces.**	**Demonstrate ability to manipulate matrices and to do matrix algebra. Demonstrate ability to solve systems of linear equations. Demonstrate ability to work within vector spaces and to distil vector space properties.**
6	**Learn to find and use eigenv alues and eigenvectors of a matrix.**	**Find the characteristic equation, eigenvalues and corresponding eigenvectors of a given matrix.**

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

NETWORK THEORY (EC 201)

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes
		On Completion Of Course Student Will Be Able To:
1	To make the students capable of analyzing any linear time invariant electrical network	Learn the basic elements of networks , network topology, how to solve an electrical network, to simplify networks using theorems.
2	To study time domain, phasor and Laplace transform methods of linear circuit analysis .	Learn to apply Laplace Transform in electronics circuits.
3	To study the transient response of networks subject to test signals.	Leran the transient analysis & S-Domain analysis for analysis & application
4	To study the network functions for the single port and two ports	Discuss the significance of Poles and Zeros, properties of driving point and transfer functions.
5	To study the two port networks.	Learn the parameters of two-port network, coupled circuit and application in electrical field
6	To develop understanding of the concept of resonance, coupled circuits.	Learn the parameters of two-port network, coupled circuit resonance and application in electrical field.
7		Explain the impedance, admittance, transmission and hybrid parameters.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

EC203 SOLID STATE DEVICES COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide an insight into the basic semiconductor concepts.	Graduates will be able to **define** and **understand** the concepts in semiconductor physics.
2	To provide a sound understanding of current semiconductor devices and technology to appreciate its applications to electronics circuits and system	Graduates will be able to **describe** and **apply** the generation and recombination processes in semiconductors.
		Graduates will be able to **explain** the structure, creation of electric field and working of PN junction semiconductor diodes.
4		Graduates will be able to **illustrate** the minority carrier distribution across PN junction semiconductor diodes.
5		Graduates will **develop** skills and can do research in new concepts and devices.
6		Graduates can **summarize** concepts that studied relating different modes of operation and the various current components in BJTs and **analyze** energy band diagram of PN junction diodes, BJTs, metal semiconductor junctions and MOS capacitors.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EC 205: ELECTRONIC CIRCUITS

Sl No.	Course Objectives	Course Outcomes
1	To explain the basic wave shaping circuits using R, L and C	Can evaluate R-L-C dc circuits and complete response of R-L and R-C

		transient circuits.
2	To explain the DC analysis of BJT circuits	Design DC biasing circuits.
3	To discuss single stage RC coupled amplifier	Design and analyze single stage amplifiers and their frequency response, its gain band width product and effect of coupling and bypass capacitors in amplifiers.
4	To develop the basic understanding of amplifier designing and its analysis using hybrid model	Explain classification of amplifiers and analyze the CE, CB, CC amplifiers using small signal hybrid model and derive the voltage gain, current gain, input impedance and output impedance.
5	Discuss multistage amplifiers	Analyze the multistage amplifier its gain and frequency response
6	To make students aware of amplifier operation at high frequency and its frequency responses.	Acquired knowledge about transistor at high frequency.
7	Learn the wideband amplifiers and various broad banding techniques	Acquire knowledge wideband amplifiers and broad banding techniques.
8	To make students learn about different types of feedback amplifiers and oscillators	Design and analyze the different types of feedback amplifiers.
		Explain the condition for oscillations in oscillators, design and analyze different types of oscillators.
	To make students learn about different types of Tuned amplifiers	Design and analyze the effects of cascading on single, double tuned amplifiers on bandwidth and explain their stability.
	To make students aware of large signal amplifiers.	Design and analyze different types of power amplifiers and compare them in terms of efficiency.
	To make students aware timing circuits and sweep circuits	Design and analyze the multivibrator circuits and sweep circuits
	To introduce the voltage regulator circuits.	Design of transistor voltage regulators.
	To explain the DC analysis of MOSFET circuits	Design DC biasing circuits.
	To explain MOSFET cascade and CS amplifier	Design MOSFET amplifiers and to determine its gain, i/p, o/p resistance

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

EC207 LOGIC CIRCUITS DESIGN

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To work with a positional number systems and numeric representations	Compare various positional number systems and binary codes
2	To introduce basic postulates of Boolean algebra and show the correlation between Boolean expression	Apply Boolean algebra in logic circuit design
3	To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits	Design combinational and sequential circuits
4	To study the fundamentals of HDL	Design and implement digital systems using basic programmable blocks
5	To design and implement combinational circuits using basic programmable blocks.	Formulate various digital systems using HDL. Capability to deal with different logic families.
6	To design and implement synchronous sequential circuits	Design Mealy Moore machine systems.

HS200: BUSINESS ECONOMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the

		students will be able to:
1	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics.	Make investment decisions based on capital budgeting methods in alignment with micro economic theories.
2	To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability;	Make investment decisions based on capital budgeting methods in alignment with macro economic theories.
3	To apply business analysis to the "firm" under different market conditions.	Analyse the profitability of the firm, economy of operation.
4	To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues.	Determination of price under various market situations with good grasp on the effect of trade cycles in business.
5		Gain knowledge of elementary accounting concepts used for preparing balance sheet And interpretation of balance sheet.
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

ELECTRONIC DEVICES AND CIRCUITS KTU

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce to the students the fundamental concepts of electronic devices and circuits for engineering applications	Explain, illustrate, and design the different electronic

		circuits using electronic components
2	To develop the skill of analysis and design of various analog circuits using electronic devices	Design circuits using operational amplifiers for various applications
3	To provide comprehensive idea about working principle, operation and applications of electronic circuits	
4	To equip the students with a sound understanding of fundamental concepts of operational amplifiers	
5	To expose to the diversity of operations that operational amplifiers can perform in a wide range of applications	
6	To expose to a variety of electronic circuits/systems using various analog ICs	

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

DESIGN AND AUTOMATION LAB (KTU)

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to
1	To familiarize the student how to simulate the digital and electronic circuit signals and system using the software which are available for modern design methodology for the rapid design and verification of complex electronic system	An ability to apply knowledge of computer, science and engineering o the analysis of electrical and electronic engineering problems
		An ability to system which include both hardware and software
		An ability to find formulate and solve engineering problem
		An ability to use modern engineering techniques

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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.501 ENGINEERING MATHEMATICS – IV (COMPLEX ANALYSIS AND LINEAR ALGEBRA)

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the basic notion in complex analysis such as Analytic Functions, Harmonic functions and their applications in fluid mechanics and differentiations and integration of	After successful completion of this course, the students master the basic concepts of complex analysis and linear algebra which they can use later in their career.

Sl. No.		
	complex functions ,transformations and their applications in engineering fields.	
2	Many fundamental ideas of Linear Algebra are introduced as a part of this course. Linear transformations provide a dynamic and graphical view of matrix-vector multiplication. Orthogonality plays an important role in computer calculations.	

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.502 ENGINEERING MANAGEMENT FOR ELECTRONICS ENGINEERS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To study and analyze the nature, purpose and domain of management in the industrial system	Able to understand and apply the basic principles of engineering management (planning, organizing, leading and controlling)
2	To understand the success factors of the industrial system. To understand about personal management, financial management.	Able to understand how to Recruit, Select, Train and provide Induction concepts and Techniques. Able to understand shares and debentures.
3	Introduce depreciation, Basic concepts of quality and Quality Control, Discuss about TQM and acceptance sampling	Analyze quality control and studied how to manage total quality. Analyse different depreciation concepts.
4	To know the performance of electronic circuits, working specifications, failure density curve, Reliability of system connected in series and parallel, failure rate calculations, maintainability, replacement	The factors influencing the dynamics of the industrial system, with the aim of creating conditions for permanent growth in productivity and efficiency, as a basis for improving the business quality of industrial systems.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.503 MICROPROCESSOR & MICROCONTROLLER COURSE

Sl. No.	Course objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To understand the basic operating concepts of microprocessors and microcontrollers.	To learnthe basics architecture, interfacing, assembly language programming ofx 8085 microprocessor.
2	To communicate with various devices using the microcontroller and microprocessor.	To understand the differences between microprocessor and microcontroller.
	To design and develop various microcontroller based systems.	To Learn the architecture, instruction set and assembly language programming of 8051 microcontroller.
4	To program the controller to make various peripherals work for specified applications.	To learn the basic concepts of using timers, interrupts, serial ports with 8051.
5		To Understand basics of peripheral interfacing(ADC, DAC, Stepper Motor, LCD, Keyboard, RTC) and their programming with 8051 microcontroller.
6		To learn the architecture, instruction set, interrupts of ARM processor. To learn the architecture of PIC microcontroller.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.504Electronic measurements & instrumentation

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be

		able to:
1	To understand various measurements techniques available	Students will able to explain the working of various electronic instruments
2	To understand basic working of instruments used for instruments	Students will able to understand dynamic charateristis of instruments.
3	To study the different bridge circuits.	Students can get the concept of different bridge circuits
4	To understand errors in measurements.	Students will able to study instrument design techniques .
5	To get the applications of various instruments.	Students will able to understand the applications of different instruments

COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.505 APPLIED ELECTROMAGNETIC THEORY

SI NO	Course Objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to :
1	To impart knowledge on the basic concepts of electric and magnetic fields.	understand the basic concepts of electromagnetic theory
2	To educate scientifically about Maxwell equations and Poynting theorem.	signal transmission through wave guide and transmission lines
3	To become familiar with propagation of signal through transmission lines and waveguides.	
4	To become familiar with propagation of signal through transmission lines and waveguides.	

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.506.2 Fuzzy Systems & Applications

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Provide an understanding of the basic mathematical elements of the theory of fuzzy sets.	Be able to distinguish between the crisp set and fuzzy set concepts through the learned differences between the crisp set characteristic function and the fuzzy set membership function.
2	Provide an emphasis on the differences and similarities between fuzzy sets and classical sets theories.	Be able to define fuzzy sets using linguistic words and represent these sets by membership functions.
	Provide a brief introduction to fuzzy arithmetic concepts.	Know fuzzy-set-related notions; such as α-level sets, convexity, normality, support, etc.
4		Become capable of representing a simple classical proposition using crisp set characteristic function and likewise representing a fuzzy proposition using fuzzy set membership function.
5		Have acquired the ability of thinking differently and have become capable, when necessary, to apply a new thinking methodology to real life problems including engineering ones.
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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

08.708 COMMUNICATION ENGINEERING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide experience on design, testing, and analysis of few electronic circuits used for communication engineering.	Simulate & validate the various functional modules of a communication system.
2	To understand basic transmission concepts and to develop strong concepts in fundamentals.	Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK.
3		Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

DIGITAL SIGNAL PROCESSING LAB

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes
		On Completion Of Course Student Will Be Able To:
1	Enable the students to explore the concepts of design, simulation and implementation of basic signals using MATLAB	Study the implementation of basic signals in MATLAB
2	Enable the students to explore the concepts of design, simulation and implementation of various operations in digital signal procerssing using MATLAB	Implement the convolution operations in MATLAb
3	Familiarize with the DSP kit	Understand the implementation of FIR and IIR filters in MATLAB
4	Implement the basic operations of DSP using kit	Familiarize the properties and architecture of DSP processor kit TMS320C6713
5		Implement the basic DSP operation in DSP kit

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COURSE OBJECTIVE AND COURSE OUTCOME FOR

13.701:NANO ELECTRONICS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To study the basics of nano electronics and nano technology	Able to know the basics of nano electronics,impacts ,limitations and methosod fabrications of nano materials,characteristic tools
2	Identify the significance of nano level fabrication of particles and layers and their characterization	Discuss trends in Microelectronics and Optoelectronics and basic properties of two dimensional semiconductor, Transport of charge in Nanostructures under Electric field and magnetic fields
3	Analyze nanoscale devices like SET,QW laser,CNT transiters,RTD etc	Explains Nanoelectonic devices and systems

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.702   OPTICAL FIBER COMMUNICATION COURSE

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes. On Completion Of Course Student Will Be Able To:
1	To understand the basics of fibers, losses in fibers, types and principle of optical sourses and detectors	Learn the basic elements of optical fiber transmission link, fiber modes configurations and structures
2	To know the receiver and amplifier structures, familiar with the design of optical communication link	Discuss the channel impairments like losses and dispersion
3	To recognise the multigigabit systems and soliton based sytsems.	Learn the various optical source materials, LED structures, quantum efficiency, Laser diodes
4		Learn the fiber optical detectors such as PIN APD diodes, noise performance in photo detector, receiver operation and configuration
		Discuss the basic receiver

		structures and amplifier configurations
5		
6		Apply the link and power budget analysis in the design of digital optical link.
7		Explain the components and principle of operation of WDM systems
8		Give the importance of soliton based systems and light wave networks in optical communication

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.703 MICROWAVE & RADAR ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Differentiate between conventional tubes and microwave tubes.	Develop the basic skills necessary for designing a wide variety of practical microwave components.
2	Explain the principle of microwave amplifiers and oscillators and analyze their parameters.	Evaluate the fundamental parameters of microwave solid state devices.
3	Describe the principle and characteristics of microwave solid state devices.	Understand important and fundamental microwave engineering parameters and terminology
4	Discuss advantages of microwave communication systems\.	Identify the types of repeaters and different FM microwave radio stations.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.704 INFORMATION THEORY AND CODING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give a basic idea about the information theory.	This course enables the student to get idea about the information content of the message according to various application and its calculation
2	To get a knowledge about various coding schemes.	This course enables the students to design a lossless transmission system on the basis of channel capacity and source coding theorem
		The course makes the students aware about the noise present in communication channels and how it is affecting to corrupt the code and how it can be corrected
4		The students are introduced about the advanced coding techniques
5		The students can understand about coding techniques for data compression.
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.705.3 REAL TIME OPERATING SYSTEMS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction of the real-time systems.	To present the mathematical model of the system.
2	Computing required for the real-time embedded systems	To develop real-time algorithm for task scheduling.
3	Communication required for the real-time embedded systems.	To understand the working of real-time operating systems and real-time database.
4	Present an overview of the real-time embedded systems in practice.	To work on design and development of protocols related to real-time communication.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.736 MEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to MEMS and micro fabrication	Be familiar with the important concepts applicable to MEMS, their fabrication.
2	To study the essential material properties	Be fluent with the design, analysis and testing of MEMS.
3	To study various sensing and transduction technique	Apply the MEMS for different applications.
4	To know various fabrication and machining process of MEMS	Analyze the engineering science and physics of MEMS devices at the micro-scale including: electrostatics, thermodynamics, piezoresistive, piezoelectric, magnetism, microfluidics, and optics.
5	Applications of microsensors and microactuators	Identify situations where MEMS sensors and actuators would be ideal for application to various products.
6	Getting access to fabrication and testing in academia and industry	

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COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.708 Modeling &simulation of COMMUNICATION SYSTEMS LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide experience on design, testing, and analysis of few electronic circuits used for communication engineering.	Simulate & validate the various functional modules of a communication system.
2	To understand basic transmission concepts and to develop strong concepts in fundamentals.	Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK.
3		Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.709 SEMINAR

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To identify various real world problems.	Collect, organize and analyse information about emerging technologies/ market demands/ current trends.
2	To develop and enhance leadership skills.	Demonstrate interpersonal skills.
3	To improve communication skills, presentation skills and other soft skills.	Awareness in keeping in with view new innovations and inventions.
4	To improve the stage courage and confidence.	
5	To set the stage for future recruitment by potential employers.	
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.710 PROJECT design

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To introduce the students to various emerging fields in electronics and communication.**	**Exhibit the strength and grip on the fundamentals of the subjects studied in the previous semesters.**
2	**To provide an opportunity to exercise the creative and innovative qualities in group project environment,**	**An ability to utilise technical resources**
3	**To excite the imagination of aspiring engineers, innovators and technopreneurs.**	**An ability to write technical documents and give oral presentation related to work completed.**
4	**To have hands-on experience in the students related field so that they can relate and reinforce what has taught in the classroom.**	**Perform requirement analysis and identify design methodologies.**

(s2)
MA 102 - DIFFERENTIAL EQUATIONS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To put it briefly, the point of this**	**Distinguish between linear, partial and**

	class is to take your existing knowledge of calculus and apply it towards the construction and solution of mathematical models in the form of differential equations.	ordinary differential equations. State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval
2	Solve non-homogeneous linear equations with constant coefficients using the methods of undetermined coefficients and variation of parameters.	Recognize and solve a non homogeneous differential equation. Find particular solutions to initial value problems.
3	Introduce the Fourier series and its application to the solution of partial differential equation.	Find the Fourier series representation of a function of one variable.
4	To provide the student with the concept and the understanding of basics in Partial Differential Equations.	Knowledge in the Technic, methodology of solving Partial Differential Equations. A basic understanding in the Transforms which are useful in solving engineering problems.
5	This course introduces ideas of wave equation and heat equation which are widely used in the 61 modeling and analysis of a wide range of physical phenomena and has got applications across all branches of engineering.	At the end of the course students will have acquired basic knowledge of differential equations and methods of solving them and their use in analyzing typical mechanical or electrical systems.
6		

CY 100: ENGINEERING CHEMISTRY COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquire knowledge about desalination of brackish water and treatment of municipal water.	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
2	To gain the knowledge of conducting polymers, bio-degradable polymers and fibre reinforced plastics.	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution. Design economically and new methods of synthesis nano materials.
	To learn significance of green chemistry and green synthesis.	Have the knowledge of converting solar energy into most needy electrical.
4	To understand mechanism of corrosion and preventive methods.	Apply their knowledge for protection of different metals from corrosion.To prevents the monuments from getting corroded.
5	To have an idea and knowledge about the Chemistry of Fuels.	Recent trends in electrochemical energy storage devices.
6	To study different types of spectroscopy.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.

BE100: ENGINEERING MECHANICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To apply the principles of mechanics to practical engineering problems.	Understand the fundamental concepts of mechanics.
2	To identify appropriate structural system for studying a given problem and isolate it from its environment.	Students would be able to apply and demonstrate the concepts of resultant and equilibrium of force system.
3	To develop simple mathematical	Students would be able to determine the

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
	model for engineering problems and carry out static analysis.	properties of planes and solids.
4	To develop simple mathematical model for engineering problems and carry out static analysis.	Understand the concepts of moment of inertia.
5		Students would be able to apply fundamental concepts of dynamics to practical problems.
6		Understand the basic elements of vibration.

BE 103: DESIGN AND ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To excite the student on creative design and its significance	To appreciate different elements involved in design and to apply them when they called for.
2	To make the student aware of the processes involved in design	Aware of product centred and user centred aspects that makes in the design process.
3	To make the student understand the interesting interaction of various segments of humanities, sciences and engineering in the evolution of a design	To be aware of different stages in design process and results of incorporating other fields with engineering stream
4	To get an exposure as to how to engineer a design.	Understand different stages in manufacturing of a designed product
5		
6		

EE 100: BASICS OF ELECTRICAL ENGINEERING COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To impart a basic knowledge in Electrical Engineering with an understanding of fundamental concepts.**	**Gain preliminary knowledge in basic concepts of Electrical Engineering.**
2	**To impart the basic knowledge about the Electric and Magnetic circuits.**	**Discuss the working of various dc and ac machines**
	To inculcate the understanding about the AC fundamentals.	**To predict the behavior of any electrical and magnetic circuits.**
4	**To understand the working of various Electrical Machines.**	**To identify the type of electrical machine used for that particular application.**
5		**To wire any circuit depending upon the requirement.**
6		**Understand working principle of various analogue electrical measuring instruments.**

Basics of mechanical engineering

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**Understanding the basic thermodynamic principles,**	**After the completion of this course, students will get necessary foundation for a complete understanding of energy and other related engineering systems.**
2	**Developing the skills to perform the analysis and design of thermodynamic systems**	**It also provides students a feel for how thermal sciences are applied in engineering practice.**
3	**Developing the skills to accurately articulate thermodynamic issues using proper thermodynamic concepts**	**Understand the laws of thermodynamics and their significance**
4	**To understand basic thermodynamic principles and laws**	**Apply the principles of thermodynamic for the analysis of thermal systems**
5	**To develop the skills to analyze and design thermodynamic systems.**	**Recognize the relations exhibited in thermodynamics.**
6		**Select materials for applications as per their thermal properties.**

CY 110 : ENGINEERING CHEMISTRY LAB COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To make students familiarize with the practical aspects of volumetric analysis of water samples ad determine the parameters like alkalinity, chlorides and hardness.	To equip the students to apply the knowledge of Chemistry and take up Chemistry related topics as parts of their project works during higher semester of the course.
2	To improve the knowledge of different types of titrations used in volumetric analysis	To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field. (b) To develop analytical capabilities of students so that they can characterize, transform and use materials in engineering and apply knowledge gained in solving related engineering problems
3	To make students develop in terms of practical skills required for analytical projects.	To develop abilities and skills that are relevant to the study and practice of Chemistry.
4	To study flash and fire point	To familiarize the students with different application oriented topics like new generation engineering material different instrumental methods etc.
5		To enable the students to acquire the knowledge in the concepts of chemistry for engineering applications.
6		

EE 110 ELECTRICAL ENGINEERING WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Study and practice on electric circuits	Draw and practice simple house wiring and testing methods
2	To develop skills leading to achievement to connect basic electrical instruments and devices	Develop practical workshop skills in the students.
3	To develop knowledge of electrical wiring and electronic circuits.	Grasp the applications of workshop equipment, wiring accessories etc
4	Various technical facilities used by electricians, wiring regulations, types of cables and electric accessories including switches, lamps, sockets etc.	Physical realization of the range of discrete and integrated semiconductor devices
5		Knowledge of protective devices in electric circuits like fuse, ELCB, MCB etc.
6		

ME 110: MECHANICAL WORKSHOP COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to basic manufacturing process like welding, moulding, fitting, assembling, smithy, carpentry works etc.	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
2	Familiarization of basic manufacturing hand tools and equipment like files, hacksaw, spanner chisel hammers, etc.	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
	Familiarization of various measuring devises like vernier height gauge, vernier caliper, micrometer, steel rule etc.	Able to choose different measuring devises according to the work.
4	Demonstration and study of various machine tools like lathe, drilling machine, milling machine etc.	Ability to name and summarise the operations of various machine tools like lathe, milling, drilling and shaping machines.
5	Familiarizing the disassembling and assembling of machine parts.	Knowledge achieved to disassemble and assemble the machine like IC engines.
6		Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.

(s4)

Probability and Random Processes

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
1	Understand concepts of probability, conditional probability and independence.	Be familiar with some of the commonly encountered random variables, in particular the Gaussian random variable.
2	Understand random variables and probability distributions.	Be able to obtain the distributions of functions of random variables
3	Understand moment generating and characteristic functions.	Be able to relate probability theory to real statistical analysis.
4	Understand and apply large deviation theory and Chernoff's bounds.	Understand the classifications of random processes and concepts such as strict stationarity, wide-sense stationarity and ergodicity.
5	Understand and apply Poisson, birth-death and renewal processes.	

COURSE OBJECTIVES AND COURSE OUTCOME FOR

EC202 SIGNALS AND SYSTEMS

Sl.No.	Course Objectives	Course Outcomes
		On completion of the course the student will be able to
1.	Understanding the fundamental characteristics of Signals and Systems	Classify systems based on their properties and determine the response of an LTI system using convolution
2	Understanding signals and systems in terms of both the time and transform domains, taking advantage of the complementary insights and tools that these different perspectives provide	Analyze the spectral characteristics of continuous time and discrete time periodic and aperiodic signals using Fourier analysis
3	Development of the mathematical skills to solve problems involving convolution, sampling and modulation	Analyze system properties based on impulse response and Fourier analysis
4.		Apply the Laplace transform and Z-transform for analysis of continuous time and discrete time signals and systems
		Understand the process of sampling and the effect of under sampling

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

EC 206 COMPUTER ORGNISATION

Sl. No.	Course objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To impart knowledge in computer architecture**	**To understand the functional units of computer.**
2	**To impart knowledge in machine language programming**	**To understand assembly instructions and machine level programming.**
	To develop understanding in IO accessing techniques and memory structures.	**Discuss various addressing modes, types of instructions and the process of executing a program.**
4	**To understand the characteristics and techniques involved with different types of memory.**	**To understand the design of single cycle and multicycle datapath.**

Sl. No.		Course Objectives	Subject Learning Outcomes or Course Outcomes
5			To learn the addressing of IO devices and IO interfaces.
6			To learn the characteristics and techniques involved in different types of memory.

HS200: BUSINESS ECONOMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics.	Make investment decisions based on capital budgeting methods in alignment with micro economic theories.
2	To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability;	Make investment decisions based on capital budgeting methods in alignment with macro economic theories.
3	To apply business analysis to the "firm" under different market conditions.	Analyse the profitability of the firm, economy of operation.
4	To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues.	Determination of price under various market situations with good grasp on the effect of trade cycles in business.
5		Gain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheet.
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

EC204 ANALOG INTEGRATED CIRCUITS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be

Sl	Course Objective	Course Outcome
		able to:
1	To understand the basic principles of analog integrated circuits. To equips the students with a sound understanding of fundamental concepts of operational amplifiers.	Infer the DC and AC characteristics of operational amplifiers and its effect on output and their compensation techniques.
2	To understand some applications of analog integrated circuits. To know the diversity of operations that the op amp can perform in a wide range of applications.	Elucidate and design the linear and non-linear applications of an opamp and special application Ics.
3	To understand the basic principles of integrated circuit fabrication ,current and voltage converters and design of oscillators.	Able to design and analyze oscillators, converters and general purpose opamp circuits.
4	To understand the basic principles of integrated circuit fabrication and design of filters and waveform generators.	Able to design and analyze filters and waveform generators.
5	To study the different types of ICs and its applications. To introduce a few special functions integrated circuits.	Able to design, classify and comprehend the working principle of data converters. Able to design Voltage regulators, multivibrators using special application IC 555, PLL and its application in communication
6	To impart basic concepts and types of data converters	Able to design ADC and DAC converters

COURSE OBJECTIVE AND COURSE OUTCOME FOR

EC 208 ANALOG COMMUNICATION

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to

1	Understand the fundamental ideas of communication system and noises and its effect in communication systems	Interpret the need for modulation and basics elements in communication system discuss the various types of noise in communication system
2	To understand the different analog amplitude modulation schemes.	Explicate parameters to determine the performance of a amplitude modulated communication system and various modulation schemes
3	To understand the SSB analog modulation schemes	Discuss various method for SSB transmission and reception .Also discussed various modified SSB transmission methods
4	To study different types of radio transmitters and receivers	Explain the principle and working of analog transmitters and receivers.
5	To explain the various communication methods used in analog signal transmission using phase modulation method	Discuss various types of phase modulation methods in analog system , it's various parameters to determine it's performance and how its transmission occurs
6	To explain the various communication methods used in analog signal reception using angle modulation method and to impart basic knowledge on public telephone systems.	Discuss various types of phase modulation methods in analog system and how its reception occurs. Know the basic idea of telephone systems

COURSE OBJECTIVE AND COURSE OUTCOME FOR

EC232: ANALOG INTEGRATED CIRCUITS LAB

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To study the working of standard digital ICs and basic building blocks	Realization of functions using basic and universal gates (SOP and POS forms).
2	To design and implement combinational circuits	Design and Realization of different digital circuits using gates
3	To design and implement sequential circuits	Study of Flip Flops, synchronous and asynchronous counters

		Realization of counters using IC's,MUX and DEMUX circuits.
4		

COURSE OBJECTIVE AND COURSE OUTCOME FOR

EC230: LOGIC CIRCUITS DESIGN LAB

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits	Realization of functions using basic and universal gates
2	To study the working of standard digital ICs and basic building blocks	Design and Realization of different digital circuits using gates
3	To design and implement combinational circuits	Study of Flip Flops, synchronous and asynchronous counters
4	To design and implement sequential circuits	Realization of counters using IC's,MUX and DEMUX circuits.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

IMAGE PROCESSING (13.601)

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes On Completion Of Course Student Will Be Able To:
1	To understand the fundamentals of image processing and various transforms used in image processing	Learn the basic elements of image processing and various image transforms.
2	To study image processing techniques like image enhancement and image restoration.	Discuss spatial domain methods and frequency domain methods of image enhancement and degradation model for restoration..
3	To study image processing techniques like image segmentation and image representation.	Learn the lossless and lossy compression, point, line and edge detection, descriptors..
4	To study morphological image processing.	Discuss different morphological operations.
5		Discuss image processing applications, DFT,DCT, Walsh, Hadamard, transforms
6		Learn the histogram equalization technique, homomorphic filtering.
7		Learn the elements of Information theory ,dilation erosion.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.602 VLSI DESIGN

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes

		On completion of course the students will be able to:
1	Explain device physics of MOS transistor, challenges in device scaling to submicron regime and short channel effects.	Be familiar with the important concepts applicable to CMOS chip, their fabrication.
2	Identify state of the art in unit processes to fabricate CMOS chip and develop an idea on the environmental impacts of the processes.	Apply the CMOS dynamic logic for different applications.
3	Explain the characteristics of CMOS inverters and design static and dynamic logic using CMOS.	Be fluent with the design, analysis and testing of CMOS IC.
4	Design data path elements like adders and multiplers in different algorithms,memory elements like RAM,ROM,PLAs.	Analyze the design of data path elements including: algorithms, memory elements.
5	Draw stick diagram and layout of inverters and gates.	Distinguish between different test generation methods and explain reliability aspects of VLSI circuits.
6	Distinguish between different test generation methods and explain reliability aspects of VLSI circuits.	How to draw stick diagram and layout of inverters and gates.

COURSE OBJECTIVE AND COURSE OUTCOME FOR

13.603 CONTROL SYSTEM (2013)

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to

1	To explain the modeling of the Control System using various methodologies	Discuss various types of system ,to find the response ,find the error, to design the system and know its response
2	To find the various time domain representation and find its response	Explained various types of time domain representation methods and to find whether it works on controlled basis
3	To find the various frequency domain representation and find its response	Explicate various types of frequency domain representation methods and to find whether it works on controlled basis
4	To design a lead or lag network And represent a system in state space	Interpret various state representation and test that help to design a control system in state space and in a controlled manner

COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.604 DIGITAL COMMUNICATION

SI NO	Course Objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to :
1	To understand the concept of Digital representation of analog source	Understand the concept of sampling and quantization
2	To introduce to various aspects of distortion less data transmission	Understand the concept of matched filtering and correlative coding
3	To have idea on geometrical representation of signals	Understand the idea of geometrical representation of signals
4	To compare Error performance of various band pass modulation techniques.	Understand the Error performance of various band pass modulation techniques
5		Understand the concept of Spread Spectrum communication

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.605ANTENNA AND WAVE PROPAGATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes

		On completion of course the students will be able to:
1	To study various antennas, arrays and radiation patterns of antennas.	Understand important and fundamental antenna engineering parameters and terminology,
2	To learn the basic parameters of antenna and various antenna parameter measurements.	Learn the basic concepts of electromagnetic wave radiation and reception
3	To understand the radio wave propagation in the atmosphere	Develop the basic skills necessary for designing a wide variety of practical antennas and antenna arrays.
4	Introduce students to the various types and models of Radio wave propagation affecting Communication Systems. Introduction to Diversity principles..	Evaluate the fundamental parameters of antennas and arrays operating at various frequencies from LF to Microwave applications.
5	To improve the design and problem solving skills	Evaluate basic propagation models in mobile radio systems.
6		Identify the atmospheric and terrestrial effects on radio wave propagation

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.606.4 PROFESSIONAL ETHICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To create awareness on professional ethics for engineers. Professional ethics refer to a branch of philosophy in respect to human conduct, differentiating right from wrong and good from bad of such actions.	Able to Understanding Professional Ethics and Human Values , need for value education and self esteem, Human values, morals, values,respect for others, living peacefully .
	To instil human values and integrity. In every area of society, ethics play a major role in decision making. Personal	Able to understand the Ethics for Engineers and problems of environmental ethics in engineering.

2	integrity and ethical choices can influence a successful life and career. Integrity is a main essence of professionals.	
3	To respect the rights of others and develop a global perspective.	Able to understand the engineer's responsibility to environment, principles of sustainability , Sustainable development, Responsibility for safety and risk etc.
4	To study Professional rights and responsibilities , Intellectual Property Rights, ethical audit and procedure.	To work on design and development of protocols related to real-time communication.

COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.607MICROCONTROLLER LAB

SI NO	Course Objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to :
1	To understand fundamental operating concepts of microprocessors and microcontrollers	Students will get programming experiments using 8051 trainer kit.
2	To apply this knowledge to more advanced structures	Students will get fundamental idea about interfacing experiments
3	To understand low level programming	Students will get realization of boolean experiments using port.
4	To understand fundamental operating concepts of PIC microcontroller	Students will get fundamental idea of microcontrollers in engineering applications

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.608 ELECTRONIC PRODUCT DESIGN AND MINIPROJECT LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Explain the stages of product development process.	Identify and decide the stages of product development process.
2	Predict the reliability of electronic products.	Design and construct reliable electronic products considering safety aspects.
3	Design electronic products considering safety aspects and hazardous environment.	Assemble electronic circuits using modern hardware after simulation the circuit.
4	Assemble electronic circuits using modern hardware after simulation the circuit.	
5	Construct products considering environmental safety and sustainable development.	

(s8)   **COURSE OBJECTIVES AND COURSE OUTCOMES FOR**

13.81ELECTRICAL DRIVES AND CONTROL

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes **On completion of course the students will be able to:**
	The student gains detailed skills related to the subject of DC and AC electrical drives	An ability to apply knowledge of mathematics, science, and engineering
	A knowledge of contemporary issues within and outside the electrical engineering profession.	An ability to design and conduct experiments, analyze and interpret data
	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	An ability to function on multi-disciplinary teams
	An understanding of professional and ethical responsibility	An ability to identify, formulate, and solve engineering problems

COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.802 ENTERTAINMENT ELECTRONICSTECHNOLOGY

Sl.No.	Course Objectives	Course Outcomes
		On completion of the course the student will be able to
1.	To discuss different types of microphone and loud speakers	Compare the different types of microphones and explain their construction

2.	To know different types of recording systems	Explain the construction and characteristics of different types loudspeakers, and steps to avoid mismatch between amplifier output and loudspeaker
3.	To get an idea of display devices used in TV system	Explain the concept and methods of optical recording and reproduction of sound during playback
4.	To discuss the working of TV systems	Describe the operation and various display technologies such as PLASMA, LCD, LED, and OLED display and compare them
5.	To understand projection display systems	Differentiate between Analog TV and Digital TV
		Explain the basic elements of TV, TV broadcasting standards, and digital compression standards
		Distinguish between different projection displays

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.803 COMPUTER COMMUNICATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	• To educate concepts, vocabulary and techniques currently used in the area of computer networks.	Identify the OSI and TCP/IP layers and their tasks. Distinguish between the OSI reference and the TCP/IP suite of protocols. Interpret and explain physical, logical and port addresses.
2	• To master the terminology and concepts of the OSI model and the TCP/IP model.	Delve into the application of analog medium like TV and Cable for data networks and computer communication and networking.
3	• To be familiar with wireless networking concepts	Discuss the data link layer of internet model and classify the various protocols in data link layer Inquire about issues related to framing, flow and error control

4		Discuss the problems and solutions associated with delivery and forwarding of packets.
5		
6		

COURSE OBJECTIVES AND COURSE OUTCOMES FOR WIRELESS COMMUNICATION(13.804)

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes On Completion Of Course Student Will Be Able To:
1	To get knowledge of evolution of mobile radio communication and various standards.	Understand the evolution of mobile radio communication from paging system tocellular systems
2	Introduction to mobile communication and mobile propagation, discuss the possible multiple access techniques	Discuss the properties of various wireless standards from 1G to 4G.
3	To learn the basic cellular systems and design fundamentals	Compare analog and digital cellular systems
4	To discuss the methods of wireless propagation and MIMOsystems	Explain the design fundaments of cellular systems
5	Recognise the different types of multiple access techniques	Analyse the wireless propagation methods based on path loss model and MIMO channel
6	To understand the basics of satellite communication	Know the importance of different multiple access techniques like TDMA, FDMA
7		Discuss the importance and basics of satellite communication and

COURSE OBJECTIVES AND COURSE OUTCOME FOR

13.805.6 MICROWAVE DEVICES AND CIRCUITS

Sl.No.	Course Objectives	Course Outcomes
		On completion of the course the student will be able to
1.	Understanding the fundamental characteristics of Microwave network analysis	Apply tools like Scattering matrix in analysis of microwave networks
2	To study the wave propagation through rectangular and circular waveguides and resonators	Analyze rectangular and circular waveguides and resonators using Maxwell's equations and explain the concept of modes of propagation
3	Understand the structure, design and wave propagation through microwave planar transmission lines	Design micro striplines, striplines and analyze them to obtain the field equations for wave propagation through them
4	Understand the basic concepts in the design of microwave filters	Study the basic concepts of filter design and design N-order filter using microstriplines
5	To study the structure, working and power relations of microwave passive devices	Explain the structure, working and S-matrix of microwave passive devices such as Directional coupler, Tee-junctions, Circulators, Isolators and phase shifters
6	To study different impedance matching techniques using lumped elements	Design single-stub and double-stub matching techniques using lumped elements
7	Understand the physics behind various solid state devices used at microwave frequencies	Explain the structure and working of microwave devices such as Gunn diode, IMPATT,TRAPPAT,MESFET and HEMT
8	Understand the of basic microwave amplifiers and oscillators design	Design a single stage microwave amplifier, a parametric amplifier and one-port negative resistance oscillator

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.806.2 BIOMEDICAL ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To know the Origin of Bioelectric	Design instruments useful to the medical

	potential and their measurements using appropriate electrodes and Transducers	community
2	To understand how to measure various biochemical and nonelectrical parameters of human system	Evaluate alternate assumptions, approaches, procedures, tradeoffs, and results related to engineering and biological problems.
	To understand the Electro-physiology of various systems and recording of the bioelectric signals	Design a variety of electronic and computer based devices
4	To discuss the working principles of various Imaging techniques.	Design software for biomedical instrumentation, medical imaging, physiological measurement.
5	To understand the design aspects of various Assist and Therapeutic Devices.	

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.807PROJECT & VIVA-VOCE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	**To have hands-on experience in the students related field so that they can relate and reinforce what has taught in the classroom.**	**Student will get the concept of real world problems.**
2	**To provide an opportunity to exercise the creative and innovative qualities in group project environment,**	**An ability to utilise technical resources**
3	**To excite the imagination of aspiring engineers, innovators and technopreneurs.**	**An ability to write technical documents and give oral presentation related to work completed.**

4	**To introduce the students to various emerging fields in electronics and communication.**	**Perform requirement analysis and identify design methodologies.**
5		Students will get the concept of advanced programming techniques.