MAHAGURU INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS &COMMUNICATION

ACADEMIC YEAR 2021-2022

ODD SEMESTER

S1 ECE (2021-2025 Batch)- KTU 2019 Scheme

SL NO	COURSE CODE	SUBJECT NAME	STAFF HANDLED
1	MAT101	Linear Algebra And Calculus	Ms Lijimole S
2	PHT 100	Engineering Physics A	Dr Sasi B
3	EST 110	Engineering Graphics	Mr Sasi K S
4	EST 120	Basics Of Civil And Mechanical Engineering	Ms Neeraja Chandrasekhar Mr John P George
5	HUN 101	Life Skills	Ms Sreeti Gangadharan
6	PHL 120	Engineering Physics Lab	Dr Sasi B
7	ESL 120	Civil And Mechanica lworkshop	Mr Sivan S Kumar

S3 ECE (2020-2024 Batch)

Sl no	Course code	Subject name	Staff handled
1	MAT201	Partial Differential Equation And Complex Analysis	Mr Ampady V K
2	ECT201	Solid State Devices	Mr Prajeesh R
3	ECT203	Logic Circuit Design	Mr Anup Vasavan
4	ECT205	Network Theory	Ms Samitha T
5	EST200	Design And Engineering	Ms Krishnendu S
6	MCN201	Sustainable Engineering	Mr Rahul N R
7	ECL201	Scientific Computing Lab	Ms Remya K
8	ECL203	Logic Design Lab	Mr Anup Vasavan

S5 ECE (2019-2023 Batch)

Sl no	Course code	Subject name	Staff handled
1	ECT301	Linear Integrated Circuits	Ms Ponnambili S
2	ECT303	Digital Signal Processing	Ms Remya K
3	ECT305	Analog And Digital Communication	Ms Sony Sethukumar
4	ECT307	Control Systems	Ms Arathi Babu
5	HUT300	Industrial Economics And Foreign Trade	Ms Geetha Vimal
6	MCN301	Disaster Management	Mr Rahul P Raj
7	ECL331	Analog Integrated Circuits And Simulation Lab	Mrs Ponnambili S
8	ECL333	Digital Signal Processing Lab	Mrs Samitha T

S7 ECE (2018-2022 Batch)

Sl no	Course code	Subject name	Staff handled
1	EC401	Information Theory & Coding	Ms SONY SETHUKUMAR
2	EC403	Microwave & Radar Engineering	Ms MALU U
3	EC405	Optical Communication	Mr PRAJEESH R
4	EC407	Computer Communication	Ms Sreelekshmi B
5	EC409	Control Systems	Mr ANUP VASAVAN
6	EC465	Mems	Ms REMYA K
7	EC451	Seminar & Project Preliminary	Ms ARATHI BABU
8	EC431	Communication Systems Lab(Optical & Microwave)	Ms SONY SETHUKUMAR

EVEN SEMESTER

S2 ECE (2021-2025 Batch)- KTU 2019 Scheme

Sl no	Course code	Subject name	Staff handled
1	MAT102	Vector Calculus, Differential Equations And Transforms	Ms Lijimole S
2	CYT100	Engineering Chemistry	Ms Renju R
3	EST100	Engineering Mechanics	Mr Sasi K S
4	EST 130	Basics Of Electrical And Electronics Engineering	Mr Amjith S Mr Prajeesh R
5	HUN102	Professional Communication	Ms Sreeti Gangadharan
6	EST102	Programming In C	Ms Namitha T N
7	CYL120	Engineering Chemistry Lab	Ms Renju R
8	ESL130	Electrical And Electronics Workshop	Ms Samitha T

S4 ECE (2020-2024 Batch)

Sl no	Course code	Subject name	Staff Handled
1	MAT204	Probability, Random Process And Numerical Methods	Ms AMBILIMOL V
2	ECT202	Analog Circuits	Mr ANUP VASAVAN
3	ECT204	Signals And Systems	Mr PRAJEESH R
4	ECT206	Computer Architecture And Microcontrollers	Ms ARATHI BABU
5	HUT200	Professional Ethics	Ms Ponnambili S
6	MCN202	Constitution Of India	Mr Kevin Sebastian
7	ECL202	Analog Circuits And Simulation Lab	Mrs PONNAMBILI S
8	ECL204	Microcontroller Lab	Mrs MALU U

S6 ECE (2019-2023 Batch)

Sl no	Course code	Subject name	Staff handled
1	ECT302	Electromagnetics	Mr Anup Vasavan
2	ECT304	Vlsi Circuit Design	Ms Malu U
3	ECT306	Information Theory And Coding	Ms Sony Sethukumar
4	ECT362	Introduction To Mems	Ms Remya K
5	HUT310	Management For Engineers	Ms Sony Sethukumar
6	ECT308	Comprehensive Course Work	Mr Prajeesh R
7	ECL332	Communication Lab	Mrs Sony Sethukumar
8	ECD334	Miniproject	Mr Prajeesh R

S8 ECE (2018-2022 Batch)

Sl no	Course code	Subject name	Staff handled
1	EC402	Nano Electronics	REMYA K
2	EC404	Advanced Communication Systems	Mr.Anup
3	EC464	Low Power Vlsi Design	Ms.Malu U
4	EC492	Project	PONNAMBILI S
5	CE482	Environmental Impact Assessment	ARATHI BABU

COURSE OBJECTIVES AND COURSE OUTCOME FOR

MA 101: LINEAR ALGEBRA AND CALCULUS

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.

PHT 100: ENGINEERING PHYSICS A

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.

EST110: ENGINEERING GRAPHICS

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 model for engineering problems and carry out static analysis.	Students would be able to determine the 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.

EST 120: BASICS OF CIVIL AND MECHANICAL ENGINEERING

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
3	To inculcate the understanding about the AC fundamentals.	To predict the behaviour 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.

HUN101: LIFE SKILLS

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	To understand the role of engineering in achieving sustainable world	To understand the need of waste disposal and management

PHL 120: ENGINEERING PHYSICS LAB

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 engineering profession satisfying 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.

ESL 120: CIVL AND MECHANICAL WORKSHOP

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.

MAT201: 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	This course introduces basic ideas of partial differential equations which are widely used in the modelling and analysis of a wide range of physical phenomena	Understand the concept and the solution of partial differential equation
2	To understand the basic theory of functions of a complex variable, residue integration and conformal transformation	Analyse and solve one dimensional wave equation and heat equation
		Understand complex functions, its continuity differentiability with the use of Cauchy Riemann equations.
4		Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function
5		Understand the series expansion of complex function about a singularity and Apply residue theorem to compute several kinds of real integrals.

ECT201 SOLID STATE DEVICES

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to understand the physics and working of solid state devices	Apply Fermi-Dirac Distribution function and Compute carrier concentration at equilibrium and the parameters associated with generation, recombination and transport mechanism
2		Explain drift and diffusion currents in extrinsic semiconductors and Compute current density due to these effects.
		Define the current components and derive the current equation in a pn junction diode and bipolar junction transistor.
4		Explain the basic MOS physics and derive the expressions for drain current in linear and saturation regions.
5		Discuss scaling of MOSFETs and short channel effects

ECT 203 LOGIC CIRCUIT DESIGN

Sl.No.	Course Outcomes	Subject Learning Outcomes Or Course Outcomes
		On Completion Of Course Student Will Be Able To:
1	This course aims to impart the basic knowledge of logic circuits and enable students to apply it to design a digital system.	Explain the elements of digital system abstractions such as digital representations of information, digital logic and Boolean algebra
2		Create an implementation of a combinational logic function described by a truth table using and/or/inv gates/ muxes
3		Compare different types of logic families with respect to performance and efficiency
4		Design a sequential logic circuit using the basic building blocks like flip-flops
5		Design and analyze combinational and sequential logic circuits through gate level Verilog models.

ECT205: NETWORK THEORY

Sl No.	Course Objectives	Course Outcomes
1	This course aims to analyze the linear time invariant electronic circuits.	Apply Mesh / Node analysis or Network Theorems to obtain steady state response of the linear time invariant networks.
2		Apply Laplace Transforms to determine the transient behaviour of RLC networks
3		Apply Network functions and Network Parameters to analyse the single port and two port networks.

MCN201 SUSTAINABLE ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Objective of this course is to inculcate in students an awareness of environmental issues and the global initiatives towards attaining sustainability.	Understand the relevance and the concept of sustainability and the global initiatives in this direction
2	The student should realize the potential of technology in bringing in sustainable practices.	Explain the different types of environmental pollution problems and their sustainable solutions
3		Discuss the environmental regulations and standards
4		Outline the concepts related to conventional and non-conventional energy
5		Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles

EST 200: DESIGN AND ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The purpose of this course is to i) introduce the undergraduate engineering students the fundamental principles of design engineering,	Explain the different concepts and principles involved in design engineering.
2	To make them understand the steps involved in the design process	Apply design thinking while learning and practicing engineering.
3	To familiarize them with the basic tools used and approaches in design.	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.

ECL 201   SCIENTIFIC COMPUTING LABORATORY

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1		Describe the needs and requirements of scientific computing and to familiarize one programming language for scientific computing and data visualization.
2		Approximate an array/matrix with matrix decomposition.
3		Implement numerical integration and differentiation.

ECL 203   LOGIC DESIGN LAB

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to
1	This course aims to (i) familiarize students with the Digital Logic Design through the implementation of Logic Circuits using ICs of basic logic gates(ii) familiarize students with the HDL based Digital Design Flow.	Design and demonstrate the functioning of various combinational and sequential circuits using ICs
		Apply an industry compatible hardware description language to implement digital circuits
		Implement digital circuits on FPGA boards and connect external hardware to the boards
		Function effectively as an individual and in a team to accomplish the given task

ECT301   LINEAR INTEGRATED CIRCUITS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to develop the skill to design circuits using operational amplifiers and other linear ICs for various applications.	Understand Op Amp fundamentals and differential amplifier configurations
2		Design operational amplifier circuits for various applications
3		Design Oscillators and active filters using opamps
4		Explain the working and applications of timer, VCO and PLL ICs
5		Outline the working of Voltage regulator IC's and Data converters

ECT303 : DIGITAL SIGNAL PROCESSING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to provide an understanding of the principles, algorithms and applications of DSP.	State and prove the fundamental properties and relations relevant to DFT and solve basic problems involving DFT based filtering methods
2		Compute DFT and IDFT using DIT and DIF radix-2 FFT algorithms
3		Design linear phase FIR filters and IIR filters for a given specification
4		Illustrate the various FIR and IIR filter structures for the realization of the given system function
5		Explain the basic multi-rate DSP operations decimation and interpolation in both time and frequency domains using supported mathematical equations
6		Explain the architecture of DSP processor (TMS320C67xx) and the finite word length effects

ECT305 : ANALOG AND DIGITAL COMMUNICATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to develop analog and digital communication systems.	Explain the existent analog communication systems.
2		Apply the concepts of random processes to LTI systems.
3		Apply waveform coding techniques in digital transmission.
4		Apply GS procedure to develop digital receivers.
5		Apply equalizer design to counteract ISI.
6		Apply digital modulation techniques in signal transmission.

ECT307 CONTROL SYSTEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to develop the skills for mathematical modelling of various control systems and stability analysis using time domain and frequency domain approaches.	Analyse electromechanical systems by mathematical modelling and derive their transfer functions
2		Determine Transient and Steady State behaviour of systems using standard test signals
3		Determine absolute stability and relative stability of a system
4		Apply frequency domain techniques to assess the system performance and to design a control system with suitable compensation techniques
5		Analyse system Controllability and Observability using state space representation

HUT300 INDUSTRIAL ECONOMICS AND FOREIGN TRADE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To equip the students to take industrial decisions and to create awareness of economic environment.	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare. (Cognitive knowledge level: Understand)
2		Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare. (Cognitive knowledge level: Understand)
3		Determine the functional requirement of a firm under various competitive conditions. (Cognitive knowledge level: Analyse)
		Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society. (Cognitive knowledge level: Analyse)
		Determine the impact of changes in global economic policies on the business opportunities of a firm. (Cognitive knowledge level: Analyse

MCN301 DISASTER MANAGEMENT

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1		Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle (Cognitive knowledge level: Understand).
		Distinguish between different hazard types and vulnerability types and do vulnerability assessment (Cognitive knowledge level: Understand).
		Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk (Cognitive knowledge level: Understand)
		Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community (Cognitive knowledge level: Apply)
		Identify factors that determine the nature of disaster response and discuss the various disaster response actions (Cognitive knowledge level: Understand).
		Explain the various legislations and best practices for disaster management and risk reduction at national and international level (Cognitive knowledge level: Understand)

ECL331   ANALOG INTEGRATED CIRCUITS AND SIMULATION LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This course aims to (i) familiarize students with the Analog Integrated Circuits and Design and implementation of application circuits using basic Analog Integrated Circuits	Use data sheets of basic Analog Integrated Circuits and design and implement application circuits using Analog ICs.
2	This course aims to familiarize students with simulation of basic Analog Integrated Circuits.	Design and simulate the application circuits with Analog Integrated Circuits using simulation tools.
3		Design and simulate the application circuits with Analog Integrated Circuits using simulation tools.

ECL333   DIGITAL SIGNAL PROCESSING LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To make the student do real time DSP computing.	Simulate digital signals
2	Dedicated DSP hardware (such as TI or Analog Devices development/evaluation boards) will be used for realization.	verify the properties of DFT computationally
3		Familiarize the DSP hardware and interface with computer
		Implement LTI systems with linear convolution.
		Implement FFT and IFFT and use it on real time signals.
		Implement FIR low pass filter.
		Implement real time LTI systems with block convolution and FFT.

S7 ECE(2018-2022 BATCH)

EC401 INFORMATION THEORY & CODING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the concept of information	Apply the knowledge of Shannon's source coding theorem and Channel coding theorem for designing an efficient and error free communication link.
2	To understand the limits of error free representation of information signals and the transmission of such signals over a noisy channel	Analyze various coding schemes
3	To design and analyze data compression techniques with varying efficiencies as per requirements	Design an optimum decoder for various coding schemes used.
4	To understand the concept of various theorems proposed by Shannon for efficient data compression and reliable transmission	
5	To give idea on different coding techniques for reliable data transmission	

EC 403 MICROWAVE & RADAR ENGINEERING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the various microwave sources, their principle of operation and measurement of various parameters	The students will be able to understand the basics of microwave engineering and radar systems.
2	To study the various microwave hybrid circuits and formulate their S matrices.	
3	To understand the basic concepts, types, working of radar and introduce to radar transmitters and receivers.	

EC 405 OPTICAL COMMUNICATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the concepts of light transmission through optical fibers, optical sources and detectors.	Know the working of optical source and detectors.
2	To compare the performance of various optical transmission schemes.	Compare the performance of various optical modulation schemes.
3	To impart the working of optical components and the principle of operation of optical amplifiers.	Apply the knowledge of optical amplifiers in the design of optical link.
4	To give idea on WDM technique	Analyse the performance of optical amplifiers.

EC 407 COMPUTER COMMUNICATION

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give the basic concepts of computer network and working of layers, protocols and interfaces in a computer network.	Different types of network topologies and protocols.
2	To introduce the fundamental techniques used in implementing secure network communications and give them an understanding of common threats and its defences.	The layers of the OSI model and TCP/IP with their functions.
3		The concept of subnetting and routing mechanisms.
4		The basic protocols of computer networks, and how they can be used to assist in network design and implementation.

EC 409 CONTROL SYSTEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the elements of control system and its modelling	Represent mathematically a systems and deriving their transfer function model.
2	To introduce methods for analyzing the time response, the frequency response and the stability of systems.	Analyse the time response and frequency response of the systems for any input
3	To design control systems with compensating techniques.	Find the stability of system
4	To introduce the state variable analysis method.	Design a control system with suitable compensation techniques
5	To introduce basic concepts of digital control systems	Analyse a digital control system.

EC 465 MEMS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To understand the operation of major classes of MEMS devices/systems	Understand the working principles of micro sensors and actuators
2	To give the fundamentals of standard micro fabrication techniques and processes	Understand the application of scaling laws in the design of micro systems
3	To understand the unique demands, environments and applications of MEMS devices	Understand the typical materials used for fabrication of micro systems
4		Understand the principles of standard micro fabrication techniques
5		Appreciate the challenges in the design and fabrication of Micro systems

EC431 COMMUNICATION SYSTEMS LAB(OPTICAL & MICROWAVE)

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide practical experience in design, testing, and analysis of few electronic devices and circuits used for microwave and optical communication engineering.	Measurement of E-plane and H-plane characteristics
2		Study of Vector Network Analyser
3		Study of losses in Optical fiber

EVEN SEMESTER

S2 ECE (2020-2024 Batch)- KTU 2019 Scheme

CYT100: ENGINEERING CHEMISTRY

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.

EST100: ENGINEERING MECHANICS

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.

EST130: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

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, specification and common values of passive components.	Student can identify the active and passive electronic components.
2	To familiarize the working and characteristics of diodes transistors, MOSFET and some measuring instruments.	Student can setup simple circuits using diodes, transistors and other electronic components.
3	To understand working of diodes in circuits and in rectifiers.	Student will get fundamental idea about basic communication and entertainment electronics.
4	To understand the concept of mobile networks.	Student will get fundamental idea about mobile operation.
5		Student will get fundamental idea about different electronic circuits.

CYL120: ENGINEERING CHEMISTRY LAB

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.

ESL130: ELECTRICAL AND ELECTRONICS WORKSHOP

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, specification and common values of passive components.	Student can identify the active and passive electronic components.
2	To familiarise the working and characteristics of diodes transistors, MOSFET and some measuring instruments.	Student can setup simple circuits using diodes, transistors and other electronic components.
3	To understand working of diodes in circuits and in rectifiers.	Student will get fundamental idea about basic communication and entertainment electronics.
4	To understand the concept of mobile networks.	Student will get fundamental idea about mobile operation.
5		Student will get fundamental idea about different electronic circuits.

MAT 102 - VECTOR CALCULUS, DIFFERENTIAL EQUATION AND TRANSFORMS

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 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.	Distinguish between linear, partial and 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 36modeling 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.

HUN 102: PROFESSIONAL COMMUNICATION

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

EST102: PROGRAMMING IN C

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/or conference 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

S4 ECE (2020 Batch)

Sl no	Course code	Subject name	Staff Handled
1	MAT204	PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODS	LIJIMOLE S
2	ECT202	ANALOG CIRCUITS	ANUP VASAVAN
3	ECT204	SIGNALS AND SYSTEMS	PRAJEESH R
4	ECT206	COMPUTER ARCHITECTURE AND MICROCONTROLLERS	ARATHI BABU
5	HUT200	PROFESSIONAL ETHICS	PONNAMBILI S
6	MCN202	CONSTITUTION OF INDIA	LEKSHMI M G
7	ECL202	ANALOG CIRCUITS AND SIMULATION LAB	ANUP VASAVAN
8	ECL204	MICROCONTROLLER LAB	SAMITHA T

MAT 204 Probability, Random Processes and Numerical methods

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.	Understand the concept, properties and important models of discrete random variables and, using them, analyse suitable random phenomena.
2	Understand random variables and probability distributions.	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena.
3	Understand moment generating and characteristic functions.	Analyse random processes using autocorrelation, power spectrum and Poisson process model as appropriate.
4	Understand and apply large deviation theory and Chernoff's bounds.	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques
5	Understand and apply Poisson, birth-death and renewal processes.	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.

ECT202 ANALOG CIRCUITS

Sl.No.	Course Objectives	Course Outcomes
		On completion of the course the student will be able to
1.	This course aims to develop the skill of analyse and design of different types of analog circuits using discrete electronic components.	Design analog signal processing circuits using diodes and first order RC circuit
2		Analyse basic amplifiers using BJT and MOSFET
3		Apply the principle of oscillator and regulated power supply circuits.

ECT 204 SIGNALS AND SYSTEMS

Sl. No.	Course objective	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	This couse aims to lay the foundational aspects of signals and systems in both continuous time and discrete time, in preparation for more advanced subjects in digital signal processing, image processing, communication theory and control systems.	Apply properties of signals and systems to classify them
2		Represent signals with the help of series and transforms
		Describe orthogonality of signals and convolution integral.
4		Apply transfer function to compute the LTI response to input signals.
5		Apply sampling theorem to discretize continuous time signals

ECT 206: COMPUTER ARCHITECTURE AND MICROCONTROLLERS

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes On completion of course the students will be able to:
1	This course aims to impart knowledge of basic computer architecture and modern microcontrollers.	Explain the functional units, I/O and memory management w.r.t a typical computer architecture.
2		Distinguish between microprocessor and microcontroller.
3		Develop simple programs using assembly language programming.
4		Interface 8051 microcontroller with peripheral devices using ALP/Embedded C
5		Familiarize system software and Advanced RISC Machine Architecture.

HUT 200 Professional Ethics

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To enable students to create awareness on ethics and human values.	Understand the core values that shape the ethical behaviour of a professional.
2		Adopt a good character and follow an ethical life.
3		Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
4		Solve moral and ethical problems through exploration and assessment by established experiments.
5		Apply the knowledge of human values and social values to contemporary ethical values and global issues.

MCN202   CONSTITUTION OF INDIA

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to
1	The study of their own country constitution and studying the importance environment as well as understanding their own human rights help the students to concentrate on their day to day discipline	Explain the background of the present constitution of India and features.
2	It also gives the knowledge and strength to face the society and people.	Utilize the fundamental rights and duties.
3		Understand the working of the union executive, parliament and judiciary.
4		Understand the working of the state executive, legislature and judiciary.
5		Utilize the special provisions and statutory institutions.
6		Show national and patriotic spirit as responsible citizens of the country

ECL 202: ANALOG CIRCUITS AND SIMULATION LAB

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course aims to (i) familiarize students with the Analog Circuits Design through the implementation of basic Analog Circuits using discrete components.	Design and demonstrate the functioning of basic analog circuits using discrete components.
2	familiarize students with simulation of basic Analog Circuits.	Design and simulate the functioning of basic analog circuits using simulation tools.
3		Function effectively as an individual and in a team to accomplish the given task.

ECL 204: MICROCONTROLLER LAB

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course aims to (i) Familiarize the students with Assembly Language Programming of modern microcontrollers.	Write an Assembly language program/Embedded C program for performing data manipulation.
2	Impart the skills for interfacing the microcontroller with the help of Embedded C/Assembly Language Programming	Develop ALP/Embedded C Programs to interface microcontroller with peripherals
3		Study of Flip Flops, synchronous and asynchronous counters
4		Perform programming/interfacing experiments with IDE for modern microcontrollers.

S6 ECE (2019-2023 BATCH)

ECT302 ELECTROMAGNETICS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course aims to impart knowledge on the basic concepts of electric and magnetic fields and its applications.	To summarize the basic mathematical concepts related to electromagnetic vector fields.
2		Analyse Maxwell's equation in different forms and apply them to diverse engineering problems.
3		To analyse electromagnetic wave propagation and wave polarization
4		To analyse the characteristics of transmission lines and solve the transmission line problems using Smith chart..
5		To analyse and evaluate the propagation of EM waves in Wave guides

ECT304 VLSI CIRCUIT DESIGN

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course aims to impart the knowledge of VLSI design methodologies and Digital VLSI circuit design.	Explain the various methodologies in ASIC and FPGA design.
2		Design VLSI Logic circuits with various MOSFET logic families
3		Compare different types of memory elements.
4		Design and analyse data path elements such as Adders and multipliers.
5		Explain MOSFET fabrication techniques and layout design rules.

ECT306: INFORMATION THEORY AND CODING

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course aims to lay down the foundation of information theory introducing both source coding and channel coding.	Explain measures of information – entropy, conditional entropy, mutual information
2	It also aims to expose students to algebraic and probabilistic error-control codes that are used for reliable transmission.	Apply Shannon's source coding theorem for data compression.
3		Apply the concept of channel capacity for characterize limits of error-free transmission.
4		Apply linear block codes for error detection and correction
5		Apply algebraic codes with reduced structural complexity for error correction
6		Understand encoding and decoding of covolutional and LDPC codes

ECT362 INTRODUCTION TO MEMS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course introduces students to the rapidly emerging, multi-disciplinary, and exciting field of Micro Electro Mechanical Systems.	Describe the working principles of micro sensors and actuators
2		Identify commonly used mechanical structures in MEMS
3		Explain the application of scaling laws in the design of micro systems
4		Identify the typical materials used for fabrication of micro systems
5		Explain the principles of standard micro fabrication techniques
6		Describe the challenges in the design and fabrication of Micro systems

HUT310

MANAGEMENT FOR ENGINEERS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	This course is intended to help the students to learn the basic concepts and functions of management and its role in the performance of an organization and to understand various decision-making approaches available for managers to achieve excellence.	Explain the characteristics of management in the contemporary context (Cognitive Knowledge level:
2	Learners shall have a broad view of different functional areas of management like operations, human resource, finance and marketing.	Describe the functions of management
3		Demonstrate ability in decision making process and productivity analysis (Cognitive Knowledge level:
4		Illustrate project management technique and develop a project schedule (Cognitive Knowledge level:
5		Summarize the functional areas of management (Cognitive Knowledge level:
6		Comprehend the concept of entrepreneurship and create business plans (Cognitive Knowledge level:

ECT308 COMPREHENSIVE COURSE WORK

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	The objective of this Course work is to ensure the comprehensive knowledge of each student in the most fundamental Program core courses in the curriculum.	Apply the knowledge of circuit theorems and solid state physics to solve the problems in electronic Circuits
2		Design a logic circuit for a specific application
3		Design linear IC circuits for linear and non-linear circuit applications.
4		Explain basic signal processing operations and Filter designs
5		Explain existent analog and digital communication systems

ECL332 COMMUNICATION LAB

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1		Setup simple prototype circuits for waveform coding and digial modulation techniques working in a team.
2		Simulate the error performance of a digital communication system using standard binary and M -ary modulation schemes
3		Develop hands-on skills to emulate a communication system with software-designed-radio working in a team.

ECD334 MINIPROJECT

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	The course aims to estimate the ability of the students in transforming the theoretical knowledge studied in to a working model of an electronic system	Be able to practice acquired knowledge within the selected area of technology for project development.
2	For enabling the students to gain experience in organisation and implementation of small projects.	Identify, discuss and justify the technical aspects and design aspects of the project with a systematic approach.
3	Design and development of Small electronic project based on hardware or a combination of hardware and software for electronics systems.	Reproduce, improve and refine technical aspects for engineering projects.
		Work as a team in development of technical projects.
		Communicate and report effectively project related activities and findings.

S8 ECE (2018-2022 BATCH)

EC402 NAN0 ELECTRONICS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To introduce the concepts of nanoelectronics.	The students will be able to understand basic concepts of nanoelectronic devices and nano technology.

EC404 ADVANCED COMMUNICATION SYSTEMS

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To impart the basic concepts of various communication system.	The students will be able to understand the basics and technology of advanced communication system

EC464 LOW POWER VLSI DESIGN

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	• To identify the power dissipation mechanisms in various MOS logic styles	Identify the sources of power dissipation in digital IC systems
2	To familiarize suitable techniques to reduce power dissipation	Understand the impact of power on system performance and reliability
3		Understand leakage sources and reduction techniques
4		Recognise advanced issues in VLSI systems, specific to the deep-submicron silicon technologies

CE 482ENVIRONMENTAL IMPACT ASSESMENT

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To study the various types of environmental pollution	To have a basic knowledge of various pollution sources and their impacts
2	To study the impact due to various types of pollutants and their assessment techniques	

EC492 PROJECT

Sl NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To apply engineering knowledge in practical problem solving	Think innovatively on the development of components, products, processes or technologies in the engineering field
2	To foster innovation in design of products, processes or systems	Apply knowledge gained in solving real life engineering problems