





CHALAKKODE P.O., KOROM, PAYYANUR, KANNUR-670 307

## COs OF ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT



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## Sree Narayana Guru College of Engineering & Technology





REGULAT	I SEMESTER	UNIVERSITY	SUBJECT NAME	CO CODE	COURSE OUTCOME
	1	CODE		CO1	solve the system of linear equations, diagonalize matrices and characterise quadratic forms.
				CO2	compute the partial and total derivatives and maxima and minima of multivariable functions
		MAT101	LINEAR ALGEBRA AND CALCULUS	CO3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
				CO4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
	1.2			CO5	Determine the Taylor and Fourier series expansion of functions and learn their applications.
				CO1	Construct free body diagram and calculate the reactions necessary to ensure static equilibrium.
				CO2	Study the effect of friction in static and dynamic conditions.
0		EST100	ENGINEERING	CO3	Understand the different properties of surfaces in relation to moment of inertia
		56	MECHANICS	CO4	Analyse and solve different problems of kinematics and kinetics.
1.50		10 and and a		CO5	Analyse and solve with and without damping of SODF.
		HUN101	LIFESKILLS	CO1	Define and Identify different life skills required in personal and professional life
	Same.			CO2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress
				CO3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
				CO4	Take part in group discussions
				CO5	Use appropriate thinking and problem solving techniques to solve new problems
				CO6	Understand the basics of teamwork and leadership
			ENGINEERING CHEMISTRY LAB	CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various
	1.20			CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
				CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR
N.		CYL100		CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
				CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
				CO 6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social,
1 33.5			ENGINEERING CHEMISTRY	CO1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields
	51	1.9		CO2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		CYT100		CO3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials
				CO4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
				CO5	Study various types of water treatment methods to develop skills for treating wastewater.

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HOD ECE

		CO2	Explain the use of various tools and devices for various field measurements
		CO3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of
		CO4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
ESL120	CIVIL & MECHANICAL WORKSHOP	CO5	Compare different techniques and devices used in civil engineering measurements
	집 핵심 한 동안을 가서 모두 제	CO6	Identify Basic Mechanical workshop operations in accordance with the material and objects
	이 것은 것은 것이 지않는 것이다.	C07	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
		CO8	Apply appropriate safety measures with respect to the mechanical workshop trades
		COI	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
		CO2	Explain different types of buildings, building components, building materials and building construction
		CO3	Describe the importance, objectives and principles of surveying.
		CO4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
		CO5	Discuss the Materials, energy systems, water management and environment for green buildings.
EST120	BASICS OF CIVIL & MECHANICAL	CO6	Analyse thermodynamic cycles and calculate its efficiency C
	ENGINEERING	C07	Illustrate the working and features of IC Engines
$(-1)^{-1} (-1)$		CO8	Explain the basic principles of Refrigeration and Air Conditioning
		CO9	Describe the working of hydraulic machinesh graphical representations as per standards.
		CO10	Explain the working of power transmission elements
		C011	Describe the basic manufacturing, metal joining and machining processes enable the student to effectively communicate basic designs throug
	PROFESSIONAL COMMUNICATION	CO1	Develop vocabulary and language skills relevant to engineering as a profession
		CO2	Analyze, interpret and effectively summarize a variety of textual content
IN DUIDO		CO3	Create effective technical presentations
HUNIUZ		CO4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus
14.00 C		CO5	Identify drawbacks in listening patterns and apply listening techniques for specific needs
		CO6	Create professional and technical documents that are clear and adhering to all the
		CO1	Analyze a computational problem and develop an algorithm/flowchart to find its solution
16		CO2	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
D07100	DECCE AND C BLC	CO3	Write readable C programs with arrays, structure or union for storing the data to be processed
E51102	PROGRAMING IN C	CO4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if require find the solution to the computational problem
The star		CO5	Write readable C programs which use pointers for array processing and parameter passing
	alour -	CO6	Develop readable C programs with files for reading input and storing output
	N	CO1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories

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		ENGINEERING PHYSICS LAB	CO2	Understand the need for precise measurement practices for data recording
	PHL120		CO3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
			CO4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			CO5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
			CO1	Compute the quantitative aspects of waves and oscillations in engineering systems.
			CO2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
	PHT100	ENGINEERING PHYSICS	CO3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			CO4	Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems
			CO5	Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system
			CO1	Compute the derivatives and line integrals of vector functions and learn their applications
		VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORM	CO2	Evaluate surface and volume integrals and learn their inter-relations and applications
	MAT102		CO3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
			CO4	compute Laplace transforms and apply them to solve problems arising in engineering
			CO5	Determine the Fourier transforms of functions and apply them to solve problems
Γ			CO1	Draw the projection of points and lines located in different quadrants
			CO2	Prepare multiview orthographic projections of objects by visualizing them in different positions
	EST110	ENGINEERING GRAPHICS	CO3	Draw sectional views and develop surfaces of a given object
	ESTITO		CO4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimension
			CO5	Convert 3D views to orthographic views
			CO6	Obtain multiview projections and solid models of objects using CAD tools
			COI	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
			CO2	Develop and solve models of magnetic circuits
	EST130	BASIS OF ELECTRICAL AND ELECTRONICS	CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
	LUTIO	ENGINEERING	CO4	Outline the basic concepts and principles of semiconductor devices
			CO5	Outline the principle of an electronic instrumentation system
L	talaya ya		CO6	Explain the principle of radio and cellular communication
		1	CO4	The student will be able to identify and test various electronic components
	ESL130	ELECTRICAL AND ELECTRONICS	CO5	The student will be able to draw circuit schematics with EDA tools
		ENGINEERING WORKSHOP	CO6	The student will be able to aassemble and test electronic circuits on boards

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(P. 1.)			C07	The student will be able to work in a team with good interpersonal skills
			COI	Apply Fermi-Dirac Distribution function and Compute carrier concentration at equilibrium and the parameters associated with generation, recombination and transport mechanism
			CO2	Explain drift and diffusion currents in extrinsic semiconductors and Compute current density due to these effects
5.000	ECT201	SOLID STATE DEVICES	CO3	Define the current components and derive the current equation in a pn junction diode and bipolar junction transistor
			CO4	Explain the basic MOS physics and derive the expressions for drain current in linear and saturation regions
			CO5	Discuss scaling of MOSFETs and short channel effects
			CO1	Explain the elements of digital system abstractions such as digital representations of information, digital logic and Boolean algebra.
	ECT202		CO2	Create an implementation of a combinational logic function described by a truth table using and/or/inv gates/ muxes.
(* ) 	EC1203	LOGIC CIRCUIT DESIGN	CO3	Compare different types of logic families with respect to performance and efficiency.
			CO4	Design a sequential logic circuit using the basic building blocks like flip-flops.
			CO5	Design and analyse combinational and sequential logic circuits through gate level Verilog models
		PROFESSIONAL ETHICS	CO1	Understand the core values that shape the ethical behaviour of a professional.
1.	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		CO2	Adopt a good character and follow an ethical life.
8 - E	HUT100		CO3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
			CO4	Solve moral and ethical problems through exploration and assessment by established experiments.
1.50	and the second		CO5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
		PARTIAL DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS	CO1	Understand the concept and the solution of partial differential equation.
			CO2	Analyse and solve one dimensional wave equation and heat equation.
	MAT201		CO3	Understand complex functions, its continuity differentiability with the use of Cauchy-Riemann equations.
\$3			CO4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function
			CO5	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function
			CO1	Understand the relevance and the concept of sustainability and the global initiatives in this direction
			CO2	Explain the different types of environmental pollution problems and their sustainable solutions
	MCN201	SUSTAINABLE ENGINEERING	CO3	Discuss the environmental regulations and standards
			CO4	Outline the concepts related to conventional and non-conventional energy
			CO5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles
	1. 1. 1		CO1	Apply Mesh / Node analysis or Network Theorems to obtain steady state response of the linear time invariant networks
	ECT205	NETWORK THEORY	CO2	Apply Laplace Transforms to determine the transient behaviour of RLC networks
	X	u	CO3	Apply Network functions and Network Parameters to analyse the single port and two port networks

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		CO1	Describe the needs and requirements of scientific computing and to familiarize one programming language for scientific computing and da visualization.
		CO2	Approximate an array/matrix with matrix decomposition.
	집 집안에 물건이 한 것 같다. 같은	CO3	Implement numerical integration and differentiation.
ECL201	SCIENTIFIC COMPUTING LAB	CO4	CO 4- Solve ordinary differential equations for engineering applications
		CO5	Compute with exported data from instruments
		CO6	Realize how periodic functions are constituted by sinusoids
		CO7	Simulate random processes and understand their statistics
		CO1	Design and demonstrate the functioning of various combinational and sequential circuits using ICs.
ECL203	LOGIC DESIGN LAB	CO2	Apply an industry compatible hardware description language to implement digital circuits.
		CO3	Implement digital circuits on FPGA boards and connect external hardware to the boards.
		COI	Understand the concept, properties and important models of discrete random variables and, using them, analyse suitable random phenomena.
	PROBABLITY RANDOM PROCESS AND NUMERICAL METHODS	CO2	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena
MAT204		CO3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population
		CO4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques
		CO5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.
	CONSTITUTION OF INDIA	CO1	Understand the core values that shapes the ethical behaviour of a professional.
		CO2	Adopt a good character and follow an ethical life.
MCN202		CO3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics
		CO4	Solve moral and ethical problems through exploration and assessment by established experiments.
		CO5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
		CO1	Explain the different concepts and principles involved in design engineering.
EST200	DESIGN AND ENGINEERING	CO2	Apply design thinking while learning and practicing engineering.
		CO3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.
		CO1	Design analog signal processing circuits using diodes and first order RC circuit
ECT202	ANALOG CIRCUITS	CO2	Analyse basic amplifiers using BJT
		CO3	Analyse basic amplifiers using MOSFET.
	diet	CO4	Analyse basic amplifiers using BJT and MOSFET and apply the principle of oscillator
	Xu	CO1	Apply properties of signals and systems to classify them

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	SIGNALS AND SYSTEMS	CO2	Represent signals with the help of series and transforms
ECT204		CO3	Describe orthogonality of signals and convolution integral
		CO4	Apply transfer function to compute the LTI response to input signals
		CO5	Apply sampling theorem to discretize continuous time signals
		COI	Explain the functional units, I/O and memory management w.r.t a typical computer architecture
		CO2	Distinguish between microprocessor and microcontroller
ECT206	COMPUTER ARCHITECTURE AND MICROCONTROLLERS	CO3	Develop simple programs using assembly language programming.
		CO4	Interface 8051 microcontroller with peripheral devices using ALP/Embedded C
		CO5	Familiarize system software and Advanced RISC Machine Architecture
		COI	Design and demonstrate the functioning of basic analog circuits using discrete components.
ECL202	ANALOG CIRCUITS AND SIMULATION LAB	CO2	Design and simulate the functioning of basic analog circuits using simulation tools.
		CO3	Function effectively as an individual and in a team to accomplish the given task
	MICROCONTROLLER LAB	CO1	Write an Assembly language program/Embedded C program for performing data manipulation.
ECL204		CO2	Develop ALP/Embedded C Programs to interface microcontroller with peripherals
		CO3	Perform programming/interfacing experiments with IDE for modern microcontrollers
	LINEAR INTEGRATED CIRCUITS	COI	The students will be able to understand Op Amp fundamentals and differential amplifier configurations
		CO2	The students will be able to design operational amplifier circuits for various applications.
ECT301		CO3	The students will be able design oscillators and active filters using op amps.
a bir oʻgʻirlingi S		CO4	The students will be able to explain the working and applications of timer, VCO and PLL ICs.
		CO5	The students will be able to outline the working of Voltage regulator IC's and Data converters
	DIGITAL SIGNAL PROCESSING	CO1	State and prove the fundamental properties and relations relevant to DFT and solve basic problems involving DFT based filtering methods.
		CO2	Compute DFT and IDFT using DIT and DIF radix-2 FFT algorithms.
ECT303		CO3	Design linear phase FIR filters and IIR filters for a given specification & basic multi-rate DSP operations decimation and interpolation in both time and frequency domains using supported mathematical equations.
1	1988년 1991년 - 1988년 1 1988년 1988년 198 1988년 1988년 198	CO4	Illustrate the various FIR and IIR filter structures for the realization of the given system function.
Section 1	and the same the second	CO5	Explain the architecture of DSP processor (TMS320C67xx) and the finite word length effects
		CO1	Explain the existent analog communication systems.
		CO2	Apply the concepts of random processes to LTI systems.
ECT305	ANALOG AND DIGITAL COMMUNICATION	CO3	Apply waveform coding techniques in digital transmission
	lient	CO4	Apply GS procedure to develop digital receivers and Apply equalizer design to counteract ISI.
L'ANS CO	New	CO5	Apply digital modulation techniques in signal transmission

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HOD ELE

KTU 2019 REGULATION

	CONTROL SYSTEMS	CO1	Analyse electromechanical systems by mathematical modelling and derive their transfer functions
		CO2	Determine Transient and Steady State behaviour of systems using standard test signals
ECT307		CO3	Determine absolute stability and relative stability of a system
		CO4	Apply frequency domain techniques to assess the system performance and to design a control system with suitable compensation techniques
		CO5	Analyse system Controllability and Observability using state space representation
		CO1	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).
		CO2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment (Cognitive knowledge level: Understand).
MCN301	DISASTER MANAGEMENT	CO3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk (Cognitive knowledge level: Understand).
		CO4	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)
		CO5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions (Cognitive knowledge level: Understand).
	JDUSTRIAL ECONOMICS AND FOREIGN TRAI	CO1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general econor welfare. (Cognitive knowledge level: Understand)
		CO2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production. (Cognitive knowledge level: Apply)
HUT300		CO3	Determine the functional requirement of a firm under various competitive conditions. (Cognitive knowledge level: Analyse)
		CO4	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)
		CO5	Determine the impact of changes in clobal economic policies on the business opportunities of a firm (Cognitive knowledge level: Analyze)
	ANALOG INTEGRATED CIRCUITS AND SIMULATION LAB	CO1	Use data shaets of hasic Analog Integrated Circuits and design and implement application circuits using Analog ICs
ECL331		CO2	Design and simulate the application circuits with Analog Integrated Circuits using simulation tools
		CO3	Function effectively as an individual and in a team to accomplish the given task
N. 4		CO1	Simulate digital signals.
		CO2	Verify the properties of DFT computationally
		CO3	Familiarize the DSP hardware and interface with computer
ECL333	DIGITAL SIGNAL PROCESSING LAB	CO4	Implement LTI systems with linear convolution.
		CO5	Implement FFT and IFFT and use it on real time signals.
		CO6	Implement FIR low pass filter.
	1 diente	C07	Implement real time LTI systems with block convolution and FFT

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HOD ELE

		CO1	To summarize the basic mathematical concepts related to electromagnetic vector fields.
		CO2	Analyse Maxwell's equation in different forms and apply them to diverse engineering problems.
ECT302	ELECTROMAGNETICS	CO3	To analyse electromagnetic wave propagation and wave polarization
		CO4	To analyse the characteristics of transmission lines and solve the transmission line
		CO5	To analyse and evaluate the propagation of EM waves in Wave guides
		CO1	Students will be able to explain the various methodologies in ASIC and FPGA design.
		CO2	Students will be able to design VLSI Logic circuits with various MOSFET logic families.
ECT304	VLSI CIRCUIT DESIGN	CO3	Students can compare different types of memory elements.
		CO4	Data path elements such as Adders and multipliers can be designed and analysed.
		CO5	Students will be able to explain MOSFET fabrication techniques and layout design rules.
		CO1	Explain measures of information - entropy, conditional entropy, mutual information
		CO2	Apply Shannon's source coding theorem for data compression.
ECT306	INFORMATION THEORY AND CODING	CO3	Apply the concept of channel capacity for characterize limits of error-free transmission.
Leisoo		CO4	Apply linear block codes for error detection and correction
		CO5	Apply algebraic codes with reduced structural complexity for error correction
		CO6	Understand encoding and decoding of convolution and LDPC codes
	DIGITAL IMAGE PROCESSING	CO1	The students will be able to distinguish / analyse the various concepts and mathematical transforms necessary for image processing
ECT352		CO2	The students will be able to understand transforms & compression techniques.
		CO3	The students will be able to differentiate and interpret the various image enhancement techniques.
		CO4	The students will be able to illustrate image restoration.
		CO5	The students will be able to illustrate image segmentation algorithm
		CO1	Explain the characteristics of management in the contemporary context (Cognitive Knowledge level: Understand).
	친구가 같은 것은 것 같아요.	CO2	Describe functions of Management
HUT310	MANAGEMENT FOR ENGINEERS	CO3	Demonstrate ability in decision making process and productivity analysis (Cognitive Knowledge level: Understand).
		CO4	Illustrate project management technique and develop a project schedule (Cognitive Knowledge level: Apply).
		CO5	Summarize the functional areas of Management
144		CO6	Comprehend the concept of entrepreneurship and create business plans (Cognitive Knowledge level: Understand).
		CO1	Apply the knowledge of circuit theorems and solid state physics to solve the problems in electronic Circuits
		CO2	Design a logic circuit for a specific application
ECT308	COMPREHENSIVE COURSE WORK	CO3	Design linear IC circuits for linear and non-linear circuit applications.
	M	CO4	Explain basic signal processing operations and Filter designs

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		CO5	Explain existent analog and digital communication systems
		COI	Setup simple prototype circuits for waveform coding and digial modulation techniques working in a team.
ECL332	COMMUNICATION LAB	CO2	Simulate the error performance of a digital communication system using standard binary and M -ary modulation schemes.
		CO3	Develop hands-on skills to emulate a communication system with software-designed-radio working in a team
		CO1	The students will be able to Be able to practice acquired knowledge within the selected area of technology for project development.
ECD334	MINIRPOJECT	CO2	The students will be able to identify, discuss and justify the technical aspects and design aspects of the project with a systematic approach.
		CO3	The students will be able to Reproduce, improve and refine technical aspects for engineering projects
		CO4	The students will be able to work as a team in development of technical projects
		CO5	The students will be able to communicate and report effectively project related activities and findings
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		CO1	Understand the basic concept of antennas and its parameters.
		CO2	Analyze the far filed pattern of Short dipole and Half wave dipole antenna.
ECT401	MICROWAVES AND ANTENNAS	CO3	Design of various broad band antennas, arrays and its radiation patterns.
		CO4	Illustrate the principle of operation of cavity resonators and various microwave sources.
		CO5	Explain various microwave hybrid circuits and microwave semiconductor devices
	OPTICAL FIBRE COMUNICATION	CO1	Understand the working and classification of optical fibers in terms of propagation modes
		CO2	Solve problems of transmission characteristics and losses in optical fiber
ECT413		CO3	Explain the constructional features and the characteristics of optical sources and detectors
		CO4	Describe the operations of optical amplifiers
		CO5	Understand the concept of WDM, FSO and LiFi
	MOBILE COMPUTING	CO1	Explain the various mobile computing applications, services, design considerations and architectures (Cognitive knowledge: Understand)
097476		CO2	Describe the various technology trends for next generation cellular wireless networks and use the spreading concept on data transmission (Cogni knowledge: Apply)
C31470		CO3	Summarize the architecture of various wireless LAN technologies (Cognitive knowledge: Understand)
136.51	중국 지역의 경험을 얻는다.	CO4	Identify the functionalities of mobile network layer and transport layer (Cognitive knowledge: Understand)
1648. v.	A Start Laker	CO5	Explain the features of Wireless Application Protocol (Cognitive knowledge: Understand)
		CO6	Interpret the security issues in mobile computing and next generation technologies (Cognitive knowledge: Understand)
	1	CO1	Describe the theories of accident causation and preventive measures of industrial accidents. (Cognitive Knowledge level: Understand)
	New	CO2	Explain about personal protective equipment, its selection, safety performance &indicators and importance of housekeeping. (Cognitive Knowled level:Understand)

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MCN401	INDUSTRIAL SAFETY ENGINEERING	CO3	Explain different issues in construction industries. (Cognitive Knowledge level:Understand)
		CO4	Describe various hazards associated with different machines and mechanical material handling. (Cognitive Knowledge level: Understand)
		CO5	Utilise different hazard identification tools in different industries with the knowledge of different types of chemical hazards. (Cognitive Knowledge level: Apply)
		CO1	Familiarize the basic Microwave components and to analyse few microwave measurements and its parameters.
ECL411	ELECTROMAGNETICS LAB	CO2	Understand the principles of fiber-optic communications and the different kind of losses, signal distortion and other signal degradation factors.
		CO3	Design and simulate basic antenna experiments with simulation tools
3		COI	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply).Read an apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze).
		CO2	Prepare a presentation about an academic document (Cognitive knowledge level: Create). Give a presentation about an academic docume (Cognitive knowledge level: Apply).
		CO3	Prepare a technical report (Cognitive knowledge level: Create
	PROJECT PHASE I	CO1	Model and solve real world problems by applying knowledge across domains
ECD415		CO2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
		CO3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
		CO4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
		CO5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
		CO6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply)
	WIRELESS COMMUNICATION	COI	Summarize the basics of cellular system and cellular design fundamentals.
		CO2	Describe the wireless channel models and discuss capacity of wireless channels.
ECT402		CO3	Analyze the performance of the modulation techniques for flat-fading channels and multicarrier modulation and Illustrate how receiver performan can be enhanced by various diversity techniques.
Section .		CO4	Identify advantages of various equalization techniques and multiple-access techniques in wireless communication.
		CO5	Calculate system parameters such antenna height, range, maximum usable frequency in different modes of radio wave propagation
1. 1. 1. 1. 1.		CO1	Define satellite communications& possible satellite orbits.
N. S. C.	1.1	CO2	Describe satellite communication subsystems& launching mechanisms of satellites.
ECT424	SATELLITE COMMUNICATION	CO3	Calculate link budgets. Provide an in-depth treatment of satellite communication systems operation and planning

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			CO4	Analyze the various methods of satellite access.
			CO5	Discuss various applications of satellite communications
			C01	COI: Understand the limitation of conventional solid state devices at Microwave, Gunn-effect diodes, Microwave generation and amplification, IMPATT and TRAPATT diodes
	1999		CO2	CO2: Design of Bipolar transistors, MESFET, Microwave amplifiers and oscillators
	ECT446	MICROWAVE DEVICES AND CIRCUITS	CO3	CO3: Analysis of Microwave Network Analysis and the corresponding signal flow graphs
<b>S8</b>		성경관에 집안하는 것이 같은 것은 것을 통하는 것이 없다.	CO4	CO4: Design of Microwave filters, Filter design by image parameter method, Filter transformation and implementation
			CO5	CO5: Understand different MICs, Distributed and lumped elements of integrated circuits, Diode control devices.
		INTERNET OF THINGS	CO1	Understand the IoT fundamentals and architecture modelling (K1)
	ECT458		CO2	Understand the smart things in IoT and functional blocks (K2)
			CO3	To understand the communication networks and protocols used in IoT. (K2)
			CO4	To understand the cloud resources, data analysis and applications. (K3)
			CO5	To apply the IoT processes in embedded applications. (K3)
1.1.1		PROJECT PHASE II	CO1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
			CO2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
	ECD416		CO3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
			CO4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
			CO5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
			CO6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).

HOD ECE

Luc

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