

## Hirasugar Institute of Technology, Nidasoshi.

Inculcating Values, Promoting Prosperity

Approved by AICTE, Recognized by Govt. of Karnataka and Affiliated to VTU Belagavi.

Accredited at 'A' Grade by NAAC

Programmes Accredited by NBA: CSE, ECE, EEE, ME

ECE Dept.

NAAC

Course\_Outcomes

2021-22

Sub Code: 18EC32

Sub Code: 18EC33

# Course Outcomes of all the courses from 3<sup>rd</sup> Semester to 8<sup>th</sup> Semester

Subject: Transform Calculus, Fourier Series And Numerical Techniques Sub Code: 18MAT31

After successful completion of this course, the students will be able to;

CO	Description	
C201.1	Use Laplace transform and inverse Laplace transform in solving differential/integral	
	equation arising in network analysis, control systems and other fields of engineering.	
C201.2	Demonstrate Fourier series to study the behavior of periodic functions and their	
	applications in system communications, digital signal processing and field theory.	
C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function	
	arising in wave and heat propagation, signals and systems	
C201.4	Solve first and second order ordinary differential equations arising in engineering	
	problems using single step and multistep numerical methods.	
C201.5	Determine the externals of functional using calculus of variations and solve problems	
	arising in dynamics of rigid bodies and vibration analysis.	

## Subject: Network Theory

After successful completion of this course, the students will be able to;

CO	Description	
	Determine currents and voltages using source transformation/ source shifting/ mesh/	
C202.1	nodal analysis and reduce given network using star-delta transformation/source	
	transformation/ source shifting.	
C202.2	Solve network problems by applying Superposition/ Reciprocity/ Thevenin's/	
	Norton's/ Maximum Power Transfer/ Millman's Network Theorems and electrical laws	
	to reduce circuit complexities and to arrive at feasible solutions.	
C202.3	Calculate current and voltages for the given circuit under transient conditions.	
C202.4	Apply Laplace transform to solve the given network.	
C202.5	Solve the given network using specified two port network parameter like Z or Y or T or	
	h and to understand the concept of resonance	

#### **Subject: Electronic Devices**

After successful completion of this course, the students will be able to;

CO	Description	
C203.1	Understand the principles of semiconductor Physics.	
C203.2	Understand the principles and characteristics of different types of semiconductor	
	devices.	
C203.3	Utilize the mathematical models of transistor for circuits and systems.	



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Course\_Outcomes

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Sub Code: 18EC34

Sub Code: 18EC35

Sub Code: 18EC36

C203.4	Utilize the mathematical models of MOS transistors for circuits and systems.	
C203.5	Understand the fabrication process of semiconductor devices.	

## Subject: Digital System Design

After successful completion of this course, the students will be able to;

Triter successful completion of this course, the students will be use to,		
CO	Description	
C204.1	Explain the concepts of combinational and sequential logic circuits.	
C204.2	Analyze & Design the combinational logic circuits.	
C204.3	Describe & Characterize flip-flops & its applications.	
C204.4	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines.	
C204.5	Design the applications of combinational and sequential circuits.	

# **Subject: Computer Organization and Architecture**

After successful completion of this course, the students will be able to;

CO	Description	
C205.1	Explain the basic organization of a computer system.	
C205.2	Explain different addressing modes and additional instructions.	
C205.3	Explain different ways of accessing an input / output device including interrupts.	
C205.4	Illustrate the organization of different types of semiconductor and other secondary	
	storage memories.	
C205.5	Illustrate simple processor organization based on hardwired control and micro	
	programmed control.	

## **Subject: Power Electronics and Instrumentation**

After successful completion of this course, the students will be able to:

The succession completion of this course, the students will be used to,		
CO	Description	
C206.1	Build and test circuits using power electronic devices.	
C206.2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS.	
C206.3	Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency and Define instrument errors.	
C206.4	Describe the principle of operation of Digital instruments and PLCs.	
C206.5	Use Instrumentation amplifier for measuring physical parameters.	



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NAAC

Course\_Outcomes

2021-22

Sub Code: 18ECL37

Sub Code: 18ECL38

## Subject: Electronic Devices and Instrumentation Lab

After successful completion of this course, the students will be able to:

Their successful completion of this course, the students will be use to,		
CO	Description	
C207.1	Recognize and demonstrate functioning of semiconductor power devices.	
C207.2	Evaluate characteristics, switching, power conversion and control by semiconductor	
	devices.	
C207.3	Analyze the response and plot characteristics of transducers such as LDR, Photo diode	
	etc.	
C207.4	7.4 Design and test simple electronic circuit for measurement of temperature and	
	resistance.	
C207.5	Use circuit simulation software for the implementation and characterization of	
	electronic circuit devices.	

## Subject: Digital System Design Lab

After successful completion of this course, the students will be able to;

The successful completion of this course, the students will be use to,		
CO	Description	
C208.1	Design, realize and verify Demorgan's theorems, SOP & POS forms.	
C208.2	Demonstrate the truth table of various expressions & combinational circuits using logic gates.	
C208.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and de-multiplexers.	
C208.4	Construct flip-flops, shift registers and counters.	
C208.5	Simulate serial adder and binary multiplier.	

#### Subject: Complex Analysis, Probability And Statistical Methods Sub Code: 18EC41

After successful completion of this course, the students will be able to;

CO	Description	
C209.1	Use the concepts of analytic function and complex potentials to solve the problems	
	arising in electromagnetic field theory.	
C209.2	Utilize conformal transformation and complex integral arising in aero-foil theory, fluid	
C209.2	flow visualization and image processing.	
C209.3	Apply discrete and continuous probability distributions in analyzing the probability	
	models arising in engineering field.	
C209.4	Make use of the correlation and regression analysis to fit a suitable mathematical	
	model for the statistical data.	
C209.5	Construct joint probability distributions and demonstrate the validity of testing the	



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Course\_Outcomes

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Subject: Analog Circuits

Sub Code: 18EC42

After successful completion of this course, the students will be able to;

	<u> </u>
CO	Description
C210.1	Analysis of biasing types and small signal models of BJT and MOSFET.
C210.2	Study of MOSFET amplifier configuration and Oscillators.
C210.3	Describe the construction and working principle of feedback amplifiers and Power
	amplifiers.
C210.4	Understand the functioning of linear ICs.
C210.5	Design of linear IC based circuits.

## **Subject: Control Systems**

Sub Code: 18EC43

After successful completion of this course, the students will be able to;

CO	Description
C211.1	Develop the mathematical model of Mechanical & Electrical Systems.
C211.2	Develop transfer function for a given control system using block diagram reduction techniques & signal flow graph method.
C211.3	Determine the time domain specifications for first & Second order systems.
C211.4	Determine the stability of a system in the time domain using Routh Hurwitz criterion & Root Locus Techniques.
C211.5	Determine the stability of a system in the frequency domain using Nyquist & Bode Plots.

#### Subject: Engg. Statistics and Linear Algebra

Sub Code: 18EC44

After successful completion of this course, the students will be able to;

CO	Description
C212.1	Identify and associate random variables and random processes in communication
	events.
C212.2	Analyze and model the random events in typical communication events to extract
	quantitative statistical parameters.
C212.3	Analyze and model typical signal sets in terms of a basis function set of amplitude,
	phase and frequency
C212.4	Explain vector spaces and it's dimensions
C212.5	Compute determinants, diagonalization and Singular Value Decomposition



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Sub Code: 18EC45

Sub Code: 18EC46

Sub Code: 18ECL47

## Subject: Signals and Systems

After successful completion of this course, the students will be able to;

CO	Description
C213.1	Classify signals as continuous/discrete, periodic/ aperiodic, even odd, energy/power and deterministic/random signals.
C213.2	Determine linearity, causality, time-invariance and stability properties of continuous and discrete time systems.
C213.3	Compute the response of continuous and discrete LTI system using convolution integral and Sum
C213.4	Determine the spectral characteristics of continuous and discrete time signal using Fourier analysis
C213.5	Compute Z-transforms, inverse Z-transforms and transfer functions of complex LTI systems.

## Subject: Microcontroller

After successful completion of this course, the students will be able to;

THIEF BUC	The successful completion of this course, the students will be dole to,	
CO	Description	
C214.1	Explain the difference between microprocessor & microcontroller	
	architecture of 8051 & interfacing it to external memory.	
C214.2	Write 8051 assembly level programs using instruction set.	
C214.3	Explain interfacing of 8051 with LEDs and switches using the concepts	
	of stack, subroutines concepts of Assembly level programming.	
C214.4	Explain the interrupt system, operation of Timers/Counters and serial	
	port of 8051	
C214.5	Write an assembly language program to generate timings and waveforms using 8051	
	timers, to send & receive serial data using port and to generate external interrupt using	
	switch	

## Subject: Microcontroller Lab

After successful completion of this course, the students will be able to;

CO	Description
C215.1	Write Assembly language programs in 8051 for solving simple problems.
C215.2	Write Assembly language programs that manipulate input data using different
	instructions of 8051.
C215.3	Interface different input and output devices to 8051.
C215.4	Control input and output devices to 8051 using Assembly language programs.
C215.5	Interface the serial devices to 8051 and do the serial transfer using C programming



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Sub Code: 18EC51

Sub Code: 18EC52

Sub Code: 18EC53

# Subject: Analog Circuits Lab

After successful completion of this course, the students will be able to;

	The sweets and the previous of this course, the students will be used to,	
CO	Description	
C216.1	Analyze frequency response of JFET/MOSFET amplifier.	
C216.2	Design BJT/FETs amplifier with and without feedback and evaluate their performance	
	characteristics.	
C216.3	Apply the knowledge gained in design of BJT/FETs circuits in oscillators.	
C216.4	Design analog circuits using OPAMPs for different applications.	
C216.5	Simulate and analyze analog circuits that uses ICs for different electronic applications.	

## Subject: Management & Entrepreneurship

After successful completion of this course, the students will be able to;

	The succession completion of this course, the success will be used to,	
CO	Description	
C301.1	Understand the fundamental concepts of management & entrepreneurship &	
	opportunities in order to setup a business.	
C301.2	Identify the various organizations architecture.	
C301.3	Describe the functions of managers, Entrepreneurs & their social responsibilities.	
C301.4	Understand the components in developing a business plan.	
C301.5	Recognize the various sources of funding & institutions supporting entrepreneurs	

## Subject: Digital Signal Processing

After successful completion of this course, the students will be able to;

CO	Description
C302.1	Determine response of LTI systems using time domain and DFT techniques.
C302.2	Compute DFT of real and complex discrete time signals.
C302.3	Computation of DFT using FFT algorithms and linear filtering approach.
C302.4	Design and realize FIR and IIR digital filters
C302.5	Understand the DSP processor architecture.

# **Subject: Principles of Communication Systems**

After successful completion of this course, the students will be able to;

	The succession compression of this course, the statement will be used to,	
CO	Description	
C303.1	Analyze and compute performance of amplitude modulation schemes in time and frequency domains.	
C303.2	Analyze and compute performance angle modulation schemes in time and frequency domains.	
C303.3	Analyze and compute the performance of AM and FM system in the presence of	

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	noise.
C303.4	Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.
C303.5	Analyze and compute the performance digital formatting process and demonstrate its use in multiplexers and encoders.

## Subject: Information Theory and Coding

After successful completion of this course, the students will be able to:

CO	Description
C304.1	Explain concept of dependent & independent source, measure of information, entropy, rate of information and order of a source.
C304.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman encoding algorithms.
C304.3	Model the continuous and discrete communication channels using input, output and joint probabilities.
C304.4	Determine a codeword comprising of the check bits computed using linear block codes, cyclic codes & convolutional codes.
C304.5	Design the encoding and decoding circuits for linear block codes, cyclic codes, convolutional codes, BCH and Golay codes.

## Subject: Electromagnetic waves

СО	Description
C305.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume
	charges by applying conventional methods and charge in a volume.
C305.2	Apply Gauss law to evaluate electric fields due to different charge distributions and
	volume charge distribution by using Divergence Theorem.
G207.2	Determine potential and energy with respect to point charge and capacitance using
C305.3	Laplace equation and apply Biot-Savart's and Ampere's laws for evaluating magnetic
	field for different current configurations.
C305.4	Calculate magnetic force, potential energy and magnetization with respect to
	magnetic materials and voltage induced in electric circuits.
C305.5	Apply Maxwell's equations for time varying fields, EM waves in free space and
	conductors and evaluate power associated with EM waves using Poynting theorem.



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Subject: Verilog HDL

After successful completion of this course, the students will be able to:

Tittel buc	The successful completion of this course, the students will be use to,	
CO	Description	
C306.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling	
	levels of Abstraction.	
C306.2	Design and verify the functionality of digital circuit/system using test benches.	
C306.3	Identify the suitable Abstraction level for a particular digital design.	
C306.4	Write the programs more effectively using Verilog tasks, functions and directives.	
C306.5	Perform timing and delay Simulation. Interpret the various constructs in logic	
	synthesis.	

Subject: **DSP Lab** 

Sub Code: 18ECL57

Sub Code: 18EC56

After successful completion of this course, the students will be able to;

CO	Description
C307.1	Understand the concepts of analog to digital conversion of signals and frequency
	domain sampling of signals.
C307.2	Modeling of discrete time signals and systems and verification of its properties and
	results.
C307.3	Implementation of discrete computations using DSP processor and verify the results.
C307.4	Realize the digital filters using a simulation tool and analyze the response of the filter
	for an audio signal.

Subject: HDL Lab

Sub Code: 18EC58

After successful completion of this course, the students will be able to;

CO	Description
C308.1	Write the Verilog programs to simulate combinational circuits in dataflow and
	behavioral.
C308.2	Write the Verilog programs to simulate combinational circuits in gate level
	abstractions.
C308.3	Describe sequential circuits like flip flops and counters in behavioral description and
	obtain simulation waveforms.
C308.4	Synthesize combinational and sequential circuits on programmable ICs and test the
	hardware.
C308.5	Interface the hardware to the programmable chips and obtain the required output



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Course\_Outcomes

2021-22

Sub Code: 18CIV59

Sub Code: 18EC61

Sub Code: 18EC62

## **Subject: Environmental Studies**

After successful completion of this course, the students will be able to;

Third successful completion of this country, the students will be used to,	
CO	Description
C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
C309.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
C309.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
C309.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

## **Subject: Digital Communication**

After successful completion of this course, the students will be able to;

CO	Description
C310.1	Associate and apply the concepts of bandpass sampling to well specified signals and channels.
C310.2	Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels.
C310.3	Explain digital modulation techniques.
C310.4	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.
C310.5	Demonstrate that bandpass signals subjected to corruption and distortion in a bandlimited channel can be processed at the receiver to meet specified performance criteria.

#### Subject: Embedded Systems

After successful completion of this course, the students will be able to;

CO	Description
C311.1	Describe the architectural features and instructions of 32 bit microcontroller ARM
	Cortex M3.
C311.2	Apply the knowledge gained for Programming ARM Cortex M3 for different
C311.2	applications.
C311.3	Understand the basic hardware components and their selection method based on the
	characteristics and attributes of an embedded system.
C311.4	Develop the hardware software co-design and firmware design approaches.
C311.5	Explain the need of real time operating system for embedded system applications.



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Course\_Outcomes

ECE Dept.

2021-22

Sub Code: 18EC63

Sub Code: 18EC641

Sub Code: 18EC646

Sub Code: 18EC652

#### Subject: Microwave and Antenna

After successful completion of this course, the students will be able to;

	<u> </u>
CO	Description
C312.1	Describe the use and advantages of microwave transmission
C312.2	various parameters related to microwave transmission lines and waveguides
C312.3	Identify microwave devices for several applications
C312.4	Analyze various antenna parameters necessary for building a RF system
C312.5	Recommend various antenna configurations according to the applications

## **Subject: Operating Systems**

After successful completion of this course, the students will be able to:

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CO	Description	
C313A.1	Explain the goals, structure, operation and types of operating systems.	
C313A.2	Apply scheduling techniques to find performance factors.	
C313A.3	Apply suitable techniques for contiguous and non-contiguous memory allocation.	
C313A.4	Explain organization of file systems and IOCS.	
C313A.5	Describe message passing, deadlock detection and prevention methods.	

## **Subject: Python Application Programming**

After successful completion of this course, the students will be able to;

CO	Description
C313F.1	Examine syntax and semantics and be fluent in the use of python flow control and functions.
C313F.2	Demonstrate proficiency in handling strings and file systems.
C313F.3	Create, run and manipulate python programs using core data structures like Lists, Dictionaries and use regular expressions.
C313F.4	Interpret the concepts of object-oriented programming as used in python.
C313F.5	Implement exemplary applications related to network programming, Web services and databases in python

## Subject: Sensors and signal conditioning

After successful completion of this course, the students will be able to;

CO	Description
C314.1	Appreciate various types of sensors and the material properties required to make
	sensors.
C314.2	Understand reactance and electromagnetic sensors and signal conditioning for it.
C314.3	Describe the self generating sensors.
C314.4	Explain digital and intelligent sensors.
C314.5	Understand sensors based on semiconductor junction.



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Course\_Outcomes

2021-22

Sub Code: 18ECL66

Sub Code: 18ECL67

Sub Code: 18ECMP68

## Subject: Communication Lab

After successful completion of this course, the students will be able to;

CO	Description
C315.1	Design and test circuits for analog modulation and demodulation schemes.
C315.2	Determine the characteristics and response of microwave waveguide.
C315.3	Determine characteristics of microstrip antennas and devices and compute the
	parameters associated with it.
C315.4	Design and test the digital and analog modulation circuits and display the waveforms.
C315.5	Simulate the digital modulation systems & compare the error performance of basic
	digital

## Subject: Embedded System Lab

After successful completion of this course, the students will be able to;

CO	Description
C316.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the
	software tool required for programming in Assembly and C language.
C316.2	Develop assembly language programs using ARM Cortex M3 for different
	applications.
C316.3	Interface external devices and I/O with ARM Cortex M3.
C316.4	Develop C language programs for embedded system applications.
C316.5	Develop library functions for embedded system applications.

## Subject: Mini-Project

CO	Description
C317.1	Practice acquired knowledge within the chosen area of technology for project
	development
C317.2	Identify, discuss and justify the technical aspects of the chosen project with a
	comprehensive and systematic approach.
C317.3	Reproduce, improve and refine technical aspects for engineering projects.
C317.4	Work as an individual or in a team in development of technical projects.
C317.5	Communicate and report effectively project related activities and findings.



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Course\_Outcomes

2021-22

Sub Code: 17EC71

Sub Code: 17EC72

Sub Code: 17EC73

## 2017 Scheme syllabus for Final year

Subject: Microwaves and Antennas

After successful completion of this course, the students will be able to;

СО	Description
	1
C401.1	Describe the use and advantages of microwave transmission.
C401.2	Analyze various parameters related to microwave transmission lines and waveguide.
C401.3	Identify microwave devices for several applications.
C401.4	Analyze various antenna parameters necessary for building an RF system.
C401.5	Recommend various antenna configurations according to the applications.

Subject: Digital Image Processing

After successful completion of this course, the students will be able to;

CO	Description
C402.1	Explain basics of digital image processing.
C402.2	Compare the different types of image transformations.
C402.3	Analyze the image enhancement using different domains and filters.
C402. 4	Illustrate different types of noise models.
C402. 5	Explain different color models in image processing.

**Subject: Power Electronics** 

The successful completion of this course, the students will be use to,	
CO	Description
C403.1	Describe the characteristics of different power devices and identify the various
	applications associated with it.
C403.2	Illustrate the working of power circuit as DC-DC converter.
C403.3	Illustrate the operation of inverter circuit and static switches.
C403.4	Determine the output response of a thyristor circuit with various triggering options.
C403.5	Determine the response of controlled rectifier with resistive and inductive loads.



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Course\_Outcomes

2021-22

Sub Code: 17EC741

#### Subject: Multimedia Communication

After successful completion of this course, the students will be able to;

CO	Description
C404A.1	Understand basics of different multimedia networks and applications.
C404A.2	Understand different compression techniques to compress audio and
	video.
C404A.3	Describe multimedia Communication across Networks.
C404A.4	Analyze different media types to represent them in digital form.
C404A.5	Compress different types of text and images using different compression techniques and analyze DMS.
	compression techniques and analyze DMS.

Subject: **Real Time Systems** Sub Code: 17EC743

After successful completion of this course, the students will be able to;

Tittel bace	The successful completion of this course, the students will be usic to,	
CO	Description	
C404C.1	Understand the fundamentals of real time systems and its classifications.	
C404C.2	Understand the concepts of computer control, operating system and the suitable	
	computer hardware requirements for real-time applications.	
C404C.3	Develop the software languages to meet real time applications.	
C404C.4	Apply suitable methodologies to design and develop real-time systems.	
C404C.5	Explain the need of real time operating system for embedded system applications.	

Subject: **Satellite Communication** Sub Code: 17EC755

CO	Description
C405E.1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.
C405E.2	Describe the electronic hardware systems associated with the satellite subsystem and earth station.
C405E.3	Describe the various applications of satellite with the focus on national satellite system.
C405E.4	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.
C405E.5	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.



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Sub Code: 17ECL76

#### Subject: Adv. Communication Lab

After successful completion of this course, the students will be able to;

CO	Description
CO	Description
C406.1	Determine the characteristics and responses of microwave devices & optical
	waveguides.
C406.2	Determine the characteristics of microstrip antennas and devices and compute the
	parameters associated with it.
C406.3	Simulate the digital modulation schemes with display of waveforms and
	computations of performance parameter.
C406.4	Design and test the modulation circuits/systems and display the waveforms.

Subject: **VLSI Lab** Sub Code: 17ECL77

After successful completion of this course, the students will be able to:

CO	Description
C407.1	Develop Verilog Codes for the basic and universal gates, combinational circuits with
	their test for verification.
C407.2	Develop Verilog Codes for sequential circuits such as Flip Flops, counters, data
	converter (SAR ADC) circuits with their Test Bench for verification.
	Design the schematic and perform post layout simulations such as DC, Transient
C407.3	Analysis, for the inverter, differential amplifier, common source and drain
	amplifiers.
C407.4	Design the layout, and Perform DRC, ERC, LVS, RC Extraction and back
	annotation for the inverter, differential amplifier, common source and drain
	amplifiers.
C407.5	Design the schematic and layout, for verification of the DC, Transient Analysis,
	DRC, ERC, LVS, RC Extraction and back annotation for the data converters

Subject: Project Work Phase - I

Sub Code: 17ECP78

After successful completion of this course, the students will be able to:

CO	Description
C408.1	Demonstrate a sound technical knowledge of their selected project topic.
C408.2	Undertake problem identification, formulation and solution.
C408.3	Design engineering solutions to complex problems utilizing a systems approach
C408.4	Survey the changes and advancements in the related area.
C408.5	Engineers and the community at large in written an oral forms.



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ECE Dept. NAAC Course\_Outcomes

2021-22

Sub Code: 17EC81

Subject: WC & LTE4G Broadband

After successful completion of this course, the students will be able to;

CO	Description
C409.1	Understand the system architecture and the functional standard specified in LTE 4G.
C409.2	Analyze the role of LTE radio interface protocols and EPS data convergence protocols
	to set up, reconfigure and release data and voice from users.
C409.3	Demonstrate the UTRAN and EPS handling processes from set up to release including
	mobility management for a variety of data call scenarios
C409.4	Test and evaluate the Performance of resource management and packet data
	processing and transport algorithms.
C409.1	Understand the system architecture and the functional standard specified in LTE 4G.

Subject: Fiber Optics & Networks

Sub Code: 17EC82

After successful completion of this course, the students will be able to;

CO	Description
C410.1	Classification and working of optical fiber with different modes of signal propagation.
C410.2	Describe the transmission characteristics and losses in optical fiber communication.
C410.3	Describe the construction and working principle of optical connectors, multiplexers and amplifiers.
C410.4	Describe the constructional features and the characteristics of optical sources and detectors.
C410.5	Illustrate the networking aspects of optical fiber and describe various standards associated with it.

Subject: Radar Engineering Sub Code: 17EC834

CO	Description
C411D.1	Understand the radar fundamentals and radar signals.
C411D.2	Explain the working principle of pulse Doppler radars, their applications and
	limitations.
C411D.3	Describe the working of various radar transmitters and receivers
C411D.4	Analyze the range parameters of pulse radar system which affect the system
C411D.5	Understand the design parameters of Radar Antennas.



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ECE Dept.

NAAC

Course\_Outcomes

2021-22

Sub Code: 17EC835

Subject: Network and cyber Security

After successful completion of this course, the students will be able to;

CO	Description
C411E.1	Explain network security protocols.
C411E.2	Understand the basic concepts of cyber security.
C411E.3	Discuss the cyber security problems.
C411E.4	Explain Enterprise Security Framework.
C411E.5	Apply concept of cyber security framework in computer system administration.

Subject: **Project Work** Sub Code: 17ECP85

After successful completion of this course, the students will be able to;

	The succession completion of this course, the students will be usic to,		
CO	Description		
C412.1	Learn on their own, reflect on their learning and take appropriate actions to improve it.		
C412.2	Make links across different areas of knowledge and to generate, develop and evaluate		
	ideas and information so as to apply these skills to the project task		
C412.3	Design and implementation of engineering solutions to societal/environment/energy		
	and automation problems utilizing a systems Approach.		
C412.4	Present the project and be able to defend it.		
C412.5	Communicate effectively and to present ideas clearly and coherently in both the		
	written and oral forms.		

Subject: **Seminar Work** Sub Code: 17ECS86

CO	Description
C413.1	Identify a topic and survey the changes in the technologies/concepts relevant to the
	topic
C413.2	Discuss the technology and interpret the impact on the society, environment and the
	domain.
C413.3	Describe the behaviours and characteristics of an effective learner.
C413.4	Exhibiting good oral and written communication skills.
C413.5	Apply principles of ethics and respect in interaction and compile the report