

COURSE OUTCOMES - 2021 SCHEME

3rd SEMESTER

Subject:	Mathematics Course		
Subject Code:	21MAT31	NBA Code:	E201
CO1	To solve ordinary differential equations using Laplace transform.		
CO2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory		
CO3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations		
CO4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations		
CO5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.		

Subject:	Digital System Design using Verilog		
Subject Code:	21EC32	NBA Code:	E203
CO1	Defining Simplification of Boolean functions using K-map and Quine-McCluskey minimization technique		
CO2	Analyze and design for combinational logic circuits		
CO3	Analyze the concepts of Flip Flops (SR, D, T and JK) and to design the synchronous sequential circuits using Flip Flops.		
CO4	Define Verilog module and data flow description.		
CO5	Modelling Combinational circuits (adders, subtractors, multiplexers) and sequential circuits using Verilog behavioral and structural descriptions.		

Subject:	Basic Signal Processing		
Subject Code:	21EC33	NBA Code:	E204
CO1	Understand the basics of Linear Algebra		
CO2	Analyse different types of signals and systems		
CO3	Analyse the properties of discrete-time signals & systems		
CO4	Analyse discrete time signals & systems using Z transforms		

Subject:	Analog Electronic Circuits		
Subject Code:	21EC34	NBA Code:	E205
CO1	Understand the characteristics of BJTs and FETs for switching and amplifier circuits.		
CO2	Design and analyze FET amplifiers and oscillators with different circuit configurations and biasing conditions		
CO3	Understand the feedback topologies and approximations in the design of amplifiers and oscillators		
CO4	Design of circuits using linear ICs for wide range applications such as ADC, DAC, filters and timers.		

CO5	Understand the power electronic device components and its functions for basic power electronic circuits
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Subject:	Analog and Digital Electronics Lab		
Subject Code:	21ECL35	NBA Code:	E206
CO1	Design and analyze the BJT/FET amplifier and oscillator circuits.		
CO2	Design and test Opamp circuits to realize the mathematical computations, DAC and precision rectifiers.		
CO3	Design and test the combinational logic circuits for the given specifications.		
CO4	Test the sequential logic circuits for the given functionality.		
CO5	Demonstrate the basic electronic circuit experiments using SCR and 555 timer.		

Subject:	LD (Logic Design) Lab using Pspice / MultiSIM		
Subject Code:	21EC381	NBA Code:	E202
CO1	Demonstrate the truth table of various expressions and combinational circuits using logic gates.		
CO2	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and code converters		
CO3	Construct flips-flops, counters and shift registers		
CO4	Design and implement synchronous counters		

Subject:	Constitution of India and Professional Ethics (CIP)		
Subject Code:	21CIP37	NBA Code:	E208
CO1	Analyse the basic structure of Indian Constitution.		
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.		
CO3	know about our Union Government, political structure & codes, procedures		
CO4	Understand our State Executive & Elections system of India		
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.		

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4th SEMESTER

Subject:	Maths for Communication Engineers		
Subject Code:	21MAT41	NBA Code:	E209
CO1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing		
CO2	Obtain series solutions of ordinary differential equation		
CO3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data		
CO4	Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering field		
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis		

Subject:	Digital Signal Processing		
Subject Code:	21EC42	NBA Code:	E211
CO1	Determine response of LTI systems using time domain and DFT techniques		
CO2	Compute DFT of real and complex discrete time signals		
CO3	Compute DFT using FFT algorithms		
CO4	Design FIR and IIR Digital Filters		
CO5	Design of Digital Filters using DSP processor		

Subject:	Circuits & Controls		
Subject Code:	21EC43	NBA Code:	E212
CO1	Analyse and solve Electric circuit, by applying, loop analysis, Nodal analysis and by applying network Theorems.		
CO2	Evaluate two port parameters of a network and Apply Laplace transforms to solve electric networks		
CO3	Deduce transfer function of a given physical system, from differential equation representation or Block Diagram representation and SFG representation		
CO4	Calculate time response specifications and analyse the stability of the system Draw and analyse the effect of gain on system behaviour using root loci		
CO5	Perform frequency response Analysis and find the stability of the system, Represent State model of the system and find the time response of the system.		

Subject:	Communication Theory		
Subject Code:	21EC44	NBA Code:	E213
CO1	Understand the amplitude and frequency modulation techniques and perform time and frequency domain transformations.		
CO2	Identify the schemes for amplitude and frequency modulation and demodulation of analog signals and compare the performance		
CO3	Characterize the influence of channel noise on analog modulated signals		
CO4	Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.		
CO5	Illustration of digital formatting representations used for Multiplexers, Vocoders and Video transmission.		

Subject:	Biology For Engineers		
Subject Code:	21BE45	NBA Code:	E214
CO1	Elucidate the basic biological concepts via relevant industrial applications and case studies.		
CO2	Evaluate the principles of design and development, for exploring novel bioengineering projects		
CO3	Corroborate the concepts of biomimetics for specific requirements		
CO4	Think critically towards exploring innovative biobased solutions for socially relevant problems		

Subject:	Communication Laboratory I		
Subject Code:	21ECL46	NBA Code:	E215
CO1	Demonstrate the AM and FM modulation and demodulation by representing the signals in time and frequency domain.		
CO2	Design and test the sampling, Multiplexing and PAM with relevant circuits		
CO3	Demonstrate the basic circuitry and operations used in AM and FM receivers		
CO4	Illustrate the operation of PCM and delta modulations for different input conditions		

Subject:	C++ Basics		
Subject Code:	21EC482	NBA Code:	E210
CO1	Write C++ program to solve simple and complex problems		
CO2	Apply and implement major object-oriented concepts like message passing, function overloading, operator overloading and inheritance to solve real-world problems		
CO3	Use major C++ features such as Templates for data type independent designs and File I/O to deal with large data set		
CO4	Analyze, design and develop solutions to real-world problems applying OOP concepts of C++		

Subject:	Universal Human Values		
Subject Code:	21UH49	NBA Code:	E218
CO1	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.		
CO2	They would have better critical ability.		
CO3	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).		
CO4	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.		

Subject:	Balake Kannada		
Subject Code:	21KBK47	NBA Code:	E216
CO1	To understand the necessity of learning of local language for comfortable life.		
CO2	To Listen and understand the Kannada language properly		
CO3	To speak, read and write Kannada language as per requirement		
CO4	To communicate (converse) in Kannada language in their daily life with kannada speakers		
CO5	To speak in polite conversation		

Subject:	Samskruthika Kannada		
Subject Code:	21KSK47	NBA Code:	E217
CO1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.		
CO2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.		
CO3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.		
CO4	ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಅಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.		

COURSE OUTCOMES - 2021 SCHEME

5th SEMESTER

Subject:	Digital Communication		
Subject Code:	21EC51	NBA Code:	E301
CO1	Analyze different digital modulation techniques and choose the appropriate modulation technique for the given specifications. 2. 3. 4. 5.		
CO2	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels.		
CO3	Differentiate various spread spectrum schemes and compute the performance parameters of communication system.		
CO4	Apply the fundamentals of information theory and perform source coding for given message		
CO5	Apply different encoding and decoding techniques with error Detection and Correction.		

Subject:	Computer Organization and ARM Microcontroller		
Subject Code:	21EC52	NBA Code:	E302
CO1	Explain the basic organization of a computer system.		
CO2	Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.		
CO3	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3.		
CO4	Apply the knowledge gained for Programming ARM Cortex M3 for different applications		

Subject:	Computer Communication Network		
Subject Code:	21EC53	NBA Code:	E303
CO1	Understand the concepts of networking thoroughly		
CO2	Identify the protocols and services of different layers.		
CO3	Distinguish the basic network configurations and standards associated with each network		
CO4	Discuss and analyse the various applications that can be implemented on networks.		

Subject:	Electromagnetic Waves		
Subject Code:	21EC54	NBA Code:	E304
CO1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.		
CO2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem		
CO3	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations • Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits		
CO4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits		
CO5	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		

Subject:	Communication Lab II		
Subject Code:	21ECL55	NBA Code:	E305
CO1	Design and test the digital modulation circuits and display the waveforms.		
CO2	To Implement the source coding algorithm using C/C++/ MATLAB code		
CO3	To Implement the Error Control coding algorithms using C/C++/ MATLAB code.		
CO4	Illustrate the operations of networking concepts and protocols using C programming and network simulators.		

Subject:	Research Methodology & Intellectual Property Rights		
Subject Code:	21RMI56	NBA Code:	E306
CO1	To know the meaning of engineering research.		
CO2	To know the procedure of literature review and technical reading.		
CO3	To know the fundamentals of patent laws and drafting procedure.		
CO4	Understanding the copyright laws and subject matters of copyrights and designs		
CO5	Understanding the basic principles of design rights		

Subject:	Environmental Studies		
Subject Code:	21CIV57	NBA Code:	E307
CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.		
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.		
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic component		
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues		

Subject:	Data Structures Using C++		
Subject Code:	21EC584	NBA Code:	E308
CO1	Identify the appropriate data structures and algorithms for solving real world problems.		
CO2	Implement various kinds of searching and sorting techniques		
CO3	Implement data structures such as stacks, queues and Search trees to solve various computing problems.		

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6th SEMESTER

Subject:	Technological Innovation Management and Entrepreneurship		
Subject Code:	21EC61	NBA Code:	E309
CO1	Understand the fundamental concepts of Management and its functions.		
CO2	Understand the different functions to be performed by managers/Entrepreneur		
CO3	Understand the social responsibilities of a Business		
CO4	Understand the Concepts of Entrepreneurship and to identify Business opportunities		
CO5	Understand the components in developing a business plan and awareness about various sources of funding and Institutions supporting Entrepreneur		

Subject:	Microwave theory & antennas		
Subject Code:	21EC62	NBA Code:	E310
CO1	Describe the use and advantages of microwave transmission		
CO2	Analyze various parameters related to transmission lines		
CO3	Identify microwave devices for several applications.		
CO4	Analyze various antenna parameters and their significance in building the RF system		
CO5	Identify various antenna configurations for suitable applications.		

Subject:	VLSI Design & Testing		
Subject Code:	21EC63	NBA Code:	E311
CO1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.		
CO2	Draw the basic gates using the stick and layout diagram with the knowledge of physical design aspects		
CO3	Interpret memory elements along with timing considerations.		
CO4	Interpret testing and testability issues in combinational logic design		
CO5	Interpret testing and testability issues in sequential logic design.		

Subject:	Artificial Neural Networks		
Subject Code:	21EC641	NBA Code:	E312
CO1	Compare and contrast the biological neural network and ANN.		
CO2	Discuss the ANN for pattern classification		
CO3	Develop and configure ANN's with different types of functions and learning algorithms		
CO4	Apply ANN for real world problems.		

Subject:	Introduction to Database Management Systems		
Subject Code:	21CS652	NBA Code:	E313
CO1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS CO 2. CO 3. CO 4.		
CO2	Use Structured Query Language (SQL) for database manipulation.		
CO3	Design and build simple database systems		
CO4	Develop application to interact with databases		

Subject:	VLSI Laboratory		
Subject Code:	21ECL66	NBA Code:	E314
CO1	Design and simulate combinational and sequential digital circuits using Verilog HDL.		
CO2	Understand the synthesis process of digital circuits using EDA tool.		
CO3	Perform ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtain optimum gate level netlist		
CO4	Design and simulate basic CMOS circuits like inverter, common source amplifier, differential amplifier, SRAM.		
CO5	Perform RTL_GDSII flow and understand the stages in ASIC design		