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BRILLIANT GRAMMAR SCHOOL EDUCATIONAL SOCIETY'S
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ELECTRONICS AND COMMUNICATION AND ENGINEERING

I & 11 SEM COURSE OUTCOMES FOR THE ACADEMIC YEAR: 2021-2022

S.No.	YEAR/SEM	COURSE NAME	Course Outcomes
1	II/I	Electronics Devices &Circuits	CO1: Analyze the applications of the p-n diode as rectifier and Zener diode as voltage regulator
			CO2: Analyze the characteristics of BJT in CB, CE and CC configurations
			CO3: Design and analyze the transistor biasing circuits for a given operating point
			CO4: Design and analyze amplifiers at low frequencies using h parameter model
			CO5: Analyze FET and MOSFET amplifiers at low frequencies
2	II/I	Digital System Design.	CO1: Understand the numerical information in different forms and Boolean Algebra theorems.
			CO2: Understand Postulates of Boolean algebra and to minimize combinational functions.
			CO3: Design and Analyze combinational and sequentialcircuits.
			CO4: Know about the logic families and realization oflogic gates.
3	II/I	Network Analysis & Transmission Theory	CO1: Gain the knowledge on basic RLC circuits behavior
			CO2: Analyze the Steady state and transient analysis of RLC Circuits.
			CO3: Know the characteristics of two port network parameters
			CO4: Analyze the transmission line parameters and configurations
	II/I	Probability Theory and	CO1: Understand probabilities and able to solve using an appropriate sample space

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4		**Stochastic Process**	**CO2:** Compute various operations like expectations from probability density functions (pdfs) and probability distribution functions
			CO3: Perform Likelihood ratio tests from pdfs for statistical engineering Problems
			CO4: : Mean and covariance functions for simple random variables
			CO5: Understand Auto-correlation and cross correlation properties between two random variables
			CO6: Explain the concept of random process, differentiate between stochastic and ergodic processes
			CO7: Explain the concept of power spectral density and power density spectrum of a random process. 8. Apply the principles of a random process in system concepts.
5	II/I	**Signals and Systems**	**CO1:** Defining the various signals and identifying the signal functions& relations
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems.
			CO4: Analyze the signals with different transform technique
6	II/I	**Electronics Devices &Circuits Lab**	**CO1:** Analyze the characteristics of p-n junction diode and Zener diode and calculate the dynamic and static resistance in forward bias and reverse bias respectively
			CO2: Calculate the ripple factor and efficiency of Half Wave and Full wave rectifiers with and without filters.
			CO3: Analyze the characteristics of BJT in Common Emitter and Common Base configurations and calculate the corresponding h-parameters
			CO4: Analyze the characteristics of FET in Common Source configuration and calculate the gm and rd. CO 5 Calculate Bandwidth of BJT/FET amplifier from its frequency response.
			CO5: Obtain the characteristics of UJT and SC
7	II/I	**Digital System Design Lab**	**CO1:** Implement Boolean Expressions using universal logic gates .
			CO2: Design and verify Combinational logic circuits using IC's .
			CO3: Design and verify Sequential logic circuits using IC's

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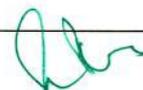Abdullapur (V), Abdullapurmet (M),
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			CO4:Implement Counters & Shift registers using FF's
8	II/I	Basic Simulation Lab	CO1: Synthesize a given waveform using standard test signals and sequences.
			CO2: Analyze the effect of various transformations applied on independent and dependent variables of a signal.
			CO3: Determine the symmetry (even/odd) of signals /sequences.
			CO4: Classify a system based on its characteristics and find its response for various excitations.
			CO5: Convert time domain signal into frequency domain using Fourier transform and plot its magnitude and phase spectrum.
9	II/II	Laplace Transforms, Numerical Methods & Complex Variables	CO1: understand the Laplace transforms techniques for solving ode's
			CO2: find the root of a given equation.
			CO3: calculate the value for the given data using interpolation
			CO4: analyze the numerical solutions for a given ode's
			CO5: analyze the complex function with reference to their analyticity, integration using cauchy'sintegral and residue theorems.
			CO6: understand taylor's and laurent's series expansions of complex function.
10	II/II	Electromagnetic Fields and Waves	CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields.
			CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
			CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
			CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems
11	II/II	Analog and Digital Communications	CO1::Analyze and design of various continuous wave and angle modulation and demodulation techniques
			CO2: Understand the effect of noise present in continuous wave and angle modulation techniques.

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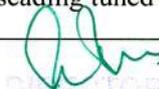Abdullapur (V), Abdullapurmet M,
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			CO3: Attain the knowledge about AM , FM Transmitters and Receivers
			CO4: Analyze and design the various Pulse Modulation Techniques.
			CO5: Understand the concepts of Digital Modulation Techniques and Baseband transmission
12	II/II	**Linear IC Applications**	**CO1:** Understand the internal operation of Op-Amp and its specifications.
			CO2: Analyze and design linear applications like adder, substractor, instrumentation amplifierand etc. using Op-Amp.
			CO3: Analyze and design nonlinear applications like multiplier, comparator and etc, using Op-Amp.
			CO4: Attain the knowledge of functional diagrams and applications of IC 555 and IC565 and applications
			CO5: Acquire the knowledge about the Data converters.
13	II/II	**Electronic Circuit Analysis**	**CO1:** Analyze single stage amplifiers at Mid-band, Low frequency and High frequency regions
			CO2: Analyze multistage amplifiers at Mid-band, Low frequency and High frequency regions.
			CO3: Design and analyze different types of feedback amplifiers and oscillators using transistors
			CO4: Analyze different types of power amplifiers and compare them in terms of efficiency.
			CO5: Analyze tuned amplifiers and the effects of cascading tuned amplifiers

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14	II/II	Analog and Digital Communications.	**CO1:**Analyze the spectrum of various analog modulation techniques
			CO2: Design a multiplexing system using FDM
			CO3: Examine various pulse modulation techniques
			CO4: Analyze different digital modulation and demodulation
15	II/II.	IC Applications Lab	**CO1:**Design analog circuits for practical applications using Op Amp IC-741
			CO2: Design waveform generators and PLL circuits using ICs
			CO3: Design multi vibrators using IC555 and Schmitt trigger using IC741
			CO4: Analyze the practical applications of Voltage Regulator using various ICs.
16	II/II	Electronic Circuits Analysis Lab	**CO1:**Design, simulate and verify basic amplifier circuits
			CO2: Design, simulate and verify feedback amplifiers and oscillators.
			CO3: Design, simulate and verify power amplifier circuits
			CO4: Design, simulate and verify Multivibrators and Sweep Circuits.
17	II/II	Gender Sensitization Lab	**CO1:**Develop a better understanding of important issues related to gender in contemporary India.
			CO2: Analyze basic dimensions of the biological, sociological, psychological and legal aspects of gender.
			CO3: Develop a sense of appreciation of women in all walks of life and will be equipped to work and live together as equals.
			CO4: Examine the new laws for women protection & relief, and empower students to understand and respond to gender violence
18	III/I	Microprocessors & Microcontrollers	**CO1:** Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.

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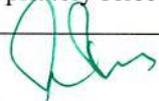Abdullapur (V), Abdullapurmet (M),
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			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
19	III/I	Data Communications and Networks	**CO1:**Analyze the Categories and functions of various Data communication Networks
			CO2: Design and analyze various error detection techniques
			CO3: Demonstrate the mechanism of routing the data in network layer
			CO4: Analyze the significance of various Flow control and Congestion control Mechanisms
			CO5: Analyze the Functioning of various Application layer Protocols.
			CO6: Analyze the features and operations of various user interface protocols.
20	III/I	Control Systems	**CO1:** Explain different ways of system representations such as Transfer function
			CO2: Apply various time domain and frequency domain techniques to assess the system performance
			CO3: Apply various control strategies to different applications like power systems, electrical drives etc
			CO4: Design various controllers and compensators to improve system performance
			CO5: Construct the State models for continuous & discrete time systems and comment on controllability and Observability of the system
			CO6: Compute the transfer function of system by different techniques.
21	III/I	Business Economics & Financial Analysis	**CO1:**Understand the various forms of business
			CO2:contrast of demand and supply
			CO3:change production, cost market structures and pricing
			CO4:study the firm's financial position
			CO5:Relate to analyze the financial statements of a company
22	III/I	Electronic Measurements and Instrumentati	**CO1:** Identify the various electronic instruments based on their specifications for carrying out a particular task of measurement.
			CO2: Measure various physical parameters by appropriately selecting the transducers.

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		on	**CO3**: Use various types of signal generators, signal analyzers for generating and analyzing Various real-time signals.
			CO4: Explain functioning, specification and applications of signal generators, signal analyzers for generating and analyzing various real-time signals.
23	III/I	Microprocessors & Microcontrollers Lab	**CO1:** Write programs in assembly language using the instruction set of 8086 through MASM software as well as using 8086 Kit.
			CO2: Interface different I/O devices with 8086 and establish communication between them.
			CO3: Write programs in assembly language using instruction set of 8051 and execute the same.
			CO4: Verify the operations of the timer, counter and serial port (UART) of 8051.
24	III/I	Data Communications and Networks Lab	**CO1:**Create and evaluate the performance of various LAN topologies
			CO2: Evaluate the performance of queue management, scheduling mechanisms and protocols
			CO3: Evaluate the performance of routing protocols and IEEE 802.x standards
			CO4: Analyze various protocols using packet capture monitoring tools.
25	III/I	Advanced Communication Skills Lab	**CO1:**Build sound vocabulary and use functional English effectively
			CO2: Analyze the given text and respond appropriately and develop efficacious writing skills
			CO3: Develop effective speaking skills and maximize job prospects
			CO4: Plan and make different forms of presentation using various techniques.
26	III/II	Antennas and Wave Propagation	**CO1:** Explain radiation mechanism and various parameters of an antenna.
			CO2: Design Loop, Helical, Horn and Yagi–Uda antennas.
			CO3: Explain the working principle of Microstrip, Reflector and Lens antennas.
			CO4:. Design different types of arrays and explain the test procedures involved in Antenna Measurements.

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			CO5: Explain the mechanisms of wave propagation and atmospheric effects on radio wave propagation
27	III/II	**Digital Signal Processing**	**CO1:** Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms
			CO3: Design a digital filter for a given specification.
			CO4: Understand the significance of various filter structures and effects of round off errors
28	III/II	**VLSI Design**	**CO1:** Explain MOS technology of NMOS, PMOS, CMOS and BiCMOS.
			CO2: Design stick diagrams and draw the layout of a logic circuit
			CO3: Analyze the architectural issues involved in subsystem design.
			CO4:. Design building blocks of data path subsystems and analyze simple memories using MOS transistors.
			C05: Apply concepts of VLSI design methodology and explain the test principles
29	III/II	**Embedded System Design**	**CO1:** To understand the selection procedure of Processors in the embedded domain
			CO2: Design Procedure for Embedded Firmware.
			CO3: To visualize the role of Real time Operating Systems in Embedded Systems.
			CO4: To evaluate the Correlation between task synchronization and latency issues.
30	III/II	**Disaster Preparedness planning Management**	**CO1:** Explain disaster management theory (cycle, phases, risk, crisis, emergency, disasters, resilience
			CO2: Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disast
			CO3:: Compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster

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			CO4: Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction
			CO5: Evaluate DM study including data search, analysis and presentation as a case study.
			CO6: Create Technological innovations in Disaster Risk Reduction: Advantages and problems
31	III/II	**Digital Signal Processing**	**CO1:** Generate sinusoidal and noise waveforms using different approaches
			CO2: Analyze Impulse and frequency response of various digital filters.
			CO3: Verify different algorithms of DSP through simulation
			CO4: Implement various DSP algorithms in hardware.
32	III/II	**e-CAD Lab**	**CO1:** Verify the functionality of digital circuits using Xilinx ISIM simulator
			CO2: Implement digital circuits on various FPGA boards using Xilinx tools
			CO3: Design layout for digital circuits and perform physical verification
			CO4: Analyze static timing, IR drop and crosstalk in digital circuit layouts
33	III/II	**Scripting Languages Lab**	**CO1:** Design and test programs to solve mathematical problems
			CO2: Develop programs Using Ruby Script
			CO3: Develop Programs Using TCL Script
			CO4: Develop Programs Using Perl Script
34	IV/I	**Microwave and Optical Communications**	**CO1:** Analyze various modes of microwave transmission lines.
			CO2: Examine various waveguide components and their applications.
			CO3: Analyze the characteristics of O-type and M-type microwave tubes
			CO4: Estimate S-parameters of multiport junction devices
			CO5: Measure various parameters using microwave bench
			CO6: Understand the mechanism of light propagation through Optical Fibers
	IV/I	**Professional**	**CO1:** understand the importance of professional practice and Law Ethics

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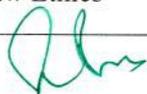Abdullapur (V), Abdullapurmet (M),
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35		**Practice, Law & Ethics**	
			CO2: Define the law of contract and its key elements of valid contract
			CO3:judge arbitration and conciliation and alternative Dispute resolution
			CO4: role play the labor and construction related laws
			CO5: Explain the students rights and Responsibility as an Employee
36	IV/I	**Network Security and Cryptography**	**CO1**: Describe network security fundamental concepts and principles
			CO2: Encrypt and decrypt messages using block ciphers and network security technology and protocols
			CO3: Analyze key agreement algorithms to identify their weaknesses
			CO4: Identify and assess different types of threats, malware, spyware, viruses, vulnerability
37	IV/I	**Digital Image Processing**	**CO1**:Remember Upon completing this course, the student will be able to Explore the fundamental relations between pixels
			CO2:Understand utility of 2-D transforms in image
			CO3:Apply processer the enhancement, segmentation
			CO4: Analyze restoration processes on an image.
			CO5:Evaluate Implement the various Morphological operations on an image
			CO6:Create the need of compression and evaluation of basic compression algorithms.
38	IV/I	**Artificial Intelligent**	**CO1**:Ability to formulate an efficient problem space for a problem expressed in natural language.
			CO2:Select a search algorithm for a problem and estimate its time and space complexities.
			CO3:Possess the skill for representing knowledge using the appropriate technique for a given problem
			CO4:Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.

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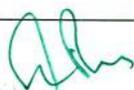R.R. Dist-501505.

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39	IV/I	Microwave and Optical Communications lab	CO1:Analyzethecharacteristicsofmicrowave sources and devices.
			CO2: Measure different parameters of various microwave devices.
			CO3: Measure the Scattering Parameters of various Tee Junctions
40	IV/I	Seminar	CO1:Identify emerging topic specific to the programmer
			CO2: Extract the information relevant to the chosen topic.
			CO3:Deliver the knowledge using multimedia
			CO4:Answer the queries with appropriate explanation and elaboration.
41	IV/1	Project Stage - I	CO1:Identify problem, conduct relevant literature survey and formalize it.
			CO2:Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes
			CO3:Implement the design and demonstrate the functionality of developed model
			CO4:Evaluate the results to derive the conclusion and provide scope for future enhancement.
42	IV/11	Radar Systems	CO1: Analyze the performance of Radar system and its parameters
			CO2: Analyze the functionality of CW and FMCW radar
			CO3: Classify the mechanism of detecting stationary and moving targets
			CO4: Compare the working mechanism of various tracking radars.
			CO5: Analyze the radar signals in noisy envionronment.
			CO6: Assess various components and parameters of Radar Receivers
43	IV/11	System on Chip Architecture	CO1: Remember SOC Architectural features.
			CO2: Understand to acquire the knowledge on processor selection criteria and limitations
			CO3: Apply to acquire the knowledge on processor selection limitations

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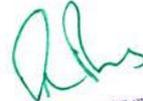Abdullapur (V), Abdullapurmet (M),
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			CO4: Analyze to acquires the knowledge of memory architectures on SOC.
			CO5: Evaluate to the interconnection strategies on SOC.
			CO6: Create to the interconnection strategies customization on SOC.
44	IV/11	**Database Management Systems**	**CO1:** Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques.
45	IV/11	**Project Stage – II**	**CO1:**Identify problem, conduct relevant literature survey and formalize it.
			CO2: Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes
			CO3: Implement the design and demonstrate the functionality of developed model
			CO4: Evaluate the results to derive the conclusion and provide scope for future enhancement.

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