

Department of Electronics Engineering

Minutes of the Board of studies meeting held on 25.11.2019

Syllabi

Scheme

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Electronics Engineering

Minutes of the Board of studies meeting on 25.11.2019

Following persons were present in the meeting:

1.	Dr. Rekha Gupta	Chairperson, Associate Professor and Head
2.	Prof. N. S. Raghava	External Member, Professor, ECE Deptt., DTU, Delhi
3.	Prof. Alok Jain	V.C. nominee R.G.P.V, Professor, SATI, Vidisha
4.	Prof. Jyoti Singhai	External Member, Professor, MANIT, Bhopal
5.	Prof. P K Singhal	Professor
6.	Dr. V. V. Thakare	Associate Professor
7.	Dr. L. Shrivastava	Associate Professor
8.	Dr. R P Narwaria	Assistant Professor
9.	Dr. Karuna Markam	Assistant Professor
10.	Mr. Madhav Singh	Assistant Professor
11.	Ms. Pooja Sahoo	Assistant Professor
12.	Mr. D. K. Parsedia	Assistant Professor
13.	All NPIU faculty members	

Following external members were absent:

1. Er. Gaurav Tripathi: Sr. Enterprise Architect, Architecture & Technology Services (ATS) HCL Technologies, HCL Technologies SEZ, Sector 126 Noida.
2. Er. Pankaj Agarwal: Assistant Engineer Hydil colony Test Lab 5 Bulandsahar UP, UP Power Corporation Limited.

At the onset, the chairperson welcomed external members to the meeting of BOS and placed the agenda for the deliberation of the members. The following deliberations were made as per the items of circulated agenda:

1	To review and finalize the list and syllabi for all Departmental Elective (DE) Courses of VI Semester under the flexible curriculum along with their COs. The list and syllabi of all Departmental Elective (DE) Courses of VI Semester under the flexible curriculum along with their COs were discussed and finalized.
2	To review and finalize the list of Courses from SWAYAM/NPTEL/MOOC Platform to be offered in online mode under DE category for credit transfer in the VI Semester.

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	The panel of examiners (UG & PG Level) for conducting practical examinations has been recommended.
11	To finalize the 'Collaborative Course' to be offered in VI semester (under DE Category) this is to be run jointly with industry person. The 'Collaborative Course' to be offered in VI semester (under DE Category) which is to be run jointly with industry person has been finalized.
12	Curricula feedback from various stakeholders, its analysis and impact Curricula feedback from various stakeholders, its analysis and impact has been discussed.
13	Any other matters

1. Dr. Rekha Gupta *P. Gupta 25.11.19*
 2. Prof. N. S. Raghava *N. S. Raghava 25/11/19*
 3. Prof. Alok Jain *A. Jain 25/11/19*
 4. Prof. Jyoti Singhai *J. Singhai*
 5. Prof. P. K. Singhal *P. K. Singhal*
 6. Dr. V. V. Thakare *V. V. Thakare 25/11/19*
 7. Dr. L. Shrivastava *L. Shrivastava 25-11-19*
 8. Dr. R P Narwaria *R. P. Narwaria 25/11/19*
 9. Dr. Karuna Markam *K. Markam 25/11/19*
 10. Mr. Madhav Singh *M. Singh 25/11/19*
 11. Ms. Pooja Sahoo *P. Sahoo*
 12. Mr. D. K. Parsedia *D. K. Parsedia 25/11/19*
- R. K. Pareek 25/11/2019*
- D. K. Parsedia 25/11/19*
- P. Sahoo 25/11/19*

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 DEAN (ACADEMICS)
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Department of Electronics Engineering**Agenda of BoS**

S. No.	Item No.	Go to Section
1	Item 1: To review and finalize the list and syllabi for all Departmental Elective (DE) Courses of VI Semester under the flexible curriculum along with their COs	<u>Item 1</u>
2	Item 2: To review and finalize the list of Courses from SWAYAM/NPTEL/MOOC Platform to be offered in online mode under DE category for credit transfer in the VI Semester	<u>Item 2</u>
3	Item 3: To review and finalize the Courses & Syllabi to be offered under Open Category (OC) Courses for VI semester students of other departments along with their COs	<u>Item 3</u>
4	Item 4: To propose the list of "Additional Courses" which can be opted for getting an (i) Honours (ii) Minor Specialization <i>[These will be completed through SWAYAM/NPTEL/MOOC based Platforms during VI semester]</i>	<u>Item 4</u>
5	Item 5: To explore and prepare the tentative list of Departmental Elective (DE) Courses (along with COs) for VII semester (including the DE course to be run through SWAYAM/NPTEL/MOOC based platform)	<u>Item 5</u>
6	Item 6: To prepare the syllabi of Mandatory Course (MC) titled "Intellectual Property Rights" (IPR) of VII semester under the flexible curriculum <i>[This will be prepared & recommended by Institution Level Committee/Academic Development Cell]</i>	--
7	Item 7: To prepare and recommend the Experiment list/ Lab manual for Laboratory Courses to be offered in VII semester	<u>Item 7</u>
8	Item 8: To review the 'Question Paper Analysis' (of mid/end semester examination) conducted for Jan-June 2019 Session <i>[On the basis of COs and other parameters separately]</i>	<u>Item 8</u>
9	Item 9: To identify gaps in CO attainment levels for Jan-June 2019 semester and propose corrective measures for improvement.	<u>Item 9</u>

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10	Item 10: To propose and recommend the panel of examiners (UG & PG Level) for conducting practical examinations.	--
11	Item 11: To finalize the 'Collaborative Course' to be offered in VI semester (under DE Category) which is to be run jointly with industry person	<u>Item 11</u>
12	Item 12: Curricula feedback from various stakeholders, its analysis and impact	--
13	Item 13: Any other matters	--

Department of Electronics Engineering

Branch: Electronics Engineering/Electronics and Telecommunication Engineering

Item 1 of BOS Agenda is written below with discussion to the BOS member;

Item 1:	To review and finalize the list and syllabi for all Departmental Elective (DE) Courses of VI Semester under the flexible curriculum along with their COs
	The syllabi for all Departmental Electives (DEs) courses up to VI Semester, to be offered under the flexible curriculum have been discussed and finalized.

Syllabus Departmental Electives (DEs)

S.No	Elective	Subject Code	Subject Name
1	Department Elective-1(DE-1)		Optical Communication
			Antenna and Wave Propagation
			Telecommunication Switching and Networks

**** (Syllabus equivalent to one credit will be covered by industry person)**

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B.Tech. VI Semester (Electronics Engineering/Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/ week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
	DE-1	Optical Communication	70	20	10	-	-	100	2	-	-	2

Optical Communication

Course objectives: This course gives information to the students about the basics of signal propagation through optical fibers, fiber fabrication, fiber losses, device components of optical fiber communication and optical networks.

Unit I - Overview of Optical Fiber Communications: Optical laws and definitions, Optical fiber modes and configurations, Mode theory, Step Index and Graded Index (GI) fibers, Single mode and Multimode, Derivation for numerical aperture, V number and modes supported by step index fiber, Mode field diameter, Modes supported by GI fibers.

Unit II - Fabrication and Coupling of Optical Fiber: Fiber materials: Glass fiber, Active glass fiber, Plastic optical fiber, Fiber fabrication techniques: Outside vapour phase oxidation, Vapour phase axial deposition, Modified chemical vapour deposition, Plasma activated chemical vapour deposition, Fiber splicing techniques, Optical fiber connectors and couplers.

Unit III - Optical Sources and Detectors: Introduction to optical sources, LED'S, LASER diodes, Model reflection noise, Power launching and Coupling, Population inversion, Photo-detectors, PIN, Avalanche detector, Response time, Avalanche multiplication noise.

Unit IV - Signal Degradation in Optical Fibers: Signal degradation in optical fibers, Attenuation losses, Signal distortion in optical wave guides, Material dispersion, Wave guide dispersion, Chromatic dispersion, Inter-modal distortion, Pulse broadening in Graded index fibers, Mode coupling.

Unit V - Optical Communication and Networks: Coherent optical fiber communication, Modulation techniques for Homodyne and Heterodyne systems, Rise time budget and link power budget, eye pattern, optical network elements and topologies, SONET / SDH.

Reference Books:

1. Optical Fiber Communication – By G. Keiser , Tata McGraw-Hill Education
2. Optical Fiber Communication- By John M. Senior, Prentice Hall

Course Outcomes:

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

CO1: Explain the basic elements of optical fiber transmission.

CO2:Discuss fiber fabrication, splicing and optical connectors.

CO3:Describe the working of optical sources and optical detectors.

CO4:Calculate the channel impairments like losses and dispersion.

CO5:Discuss Coherent optical transmission system and optical networks.

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B.Tech. VI Semester (Electronics Engineering/Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/ week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
	DE-1	Antenna and Wave Propagation	70	20	10	-	-	100	2	-	-	2

ANTENNA AND WAVE PROPAGATION

Course objectives: To develop the students' basic understanding of antenna operation and develop the students' ability to calculate and interpret basic antenna performance parameters.

Unit I Introduction to antenna: Definition of antenna parameters – Radiation Density, Radiation Intensity, Gain, Directivity, Radiation Resistance, Band width, Beam width, Input Impedance, Effective Height, Effective aperture, Network theorems applied to antenna, Self and mutual impedance of antenna.

Unit II Radiation Fields of Wire Antennas: Radiation from current element, Short dipole, Quarter wave Monopole and Half wave Dipole, Loop antenna, Helical antenna.

Unit III Antenna Arrays

Antenna arrays of point sources, Two element array, End fire and Broad side arrays, Principle of Pattern multiplication, Uniform linear arrays of N-elements, Linear arrays with non-uniform amplitude distribution (Binomial distribution and Chebyshev optimum distribution). Arrays of two-driven half wave length elements (Broad side and end fire case).

Unit III Aperture and special Antennas: Radiation from rectangular apertures, Horn antenna, Reflector antenna, Babinet's principles and complimentary antennas, Slot antennas, Log periodic antenna, Yagi uda antenna, Travelling wave antenna, Image antenna.

Unit V Propagation of radio wave: Modes of propagation , Structure of atmosphere , Ground wave propagation , Tropospheric propagation , Duct propagation, Flat earth and Curved earth concept, Sky wave propagation – Virtual height, Critical frequency , Maximum usable frequency – Skip distance, Fading , Multi hop propagation.

Reference Books:

1. Antenna theory- J.D. Kraus, 4th edition, Tata Mc-Graw Hill
2. Electromagnetic Fields & Radiating System - Jordan & Balmain, 2nd edition, PHI
3. Antennas(for all applications)- Kraus, Marshfka, khan, Tata Mc-Graw Hill
4. Antenna Wave Propagation-K D Prashad, New Delhi : Satya Prakashan

Course Outcome:

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

- CO1. Evaluate various parameters of the antenna.
- CO2. Analyze the design parameters and radiation mechanism of wire antennas.
- CO3. Design antenna array for the given radiation characteristics.
- CO4. Analyze the design parameters and radiation characteristics of Aperture and special antennas.
- CO5. Describe effects of earth and its atmosphere on radio wave propagation.

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B.Tech. VI Semester (Electronics Engineering/Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/ week			Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
	DE-I	Telecom Switching and Networks	70	20	10	-	-	100	2	-	-	2

Telecommunication Switching and Networks

Course Objectives: To introduce fundamentals functions of a telecom switching office, namely, digital multiplexing, digital switching and digital subscriber access and to introduce a mathematical model for the analysis of telecommunication traffic.

Unit 1 Introduction: Evolution of Telecommunications, Simple Telephone Communication, Manual switching system, Strowger Switching System, Crossbar Switching System, major telecommunication Networks (PSTN, ISDN, WLAN, Ad Hoc Network).

Unit 2 Switching: Circuit Switching, Store and Forward Switching, Electronic Space Division Switching, Stored Program Control, Centralized SPC, Distributed SPC, Enhanced Services, Two stage networks, three stage network n-stage networks. Time multiplexed Space Switching, Time Multiplexed time switching, combination Switching, Three stage combination switching, n-stage combination switching.

Unit 3 Traffic Engineering: Network Traffic load and parameters, Grade of service and blocking probability, Modeling Switching Systems, Incoming Traffic and Service Time Characterization, Blocking Models and Loss Estimates, Delay systems

Unit 4 Telephone Networks: Subscriber Loop Systems, Switching Hierarchy and Routing, Transmission Plan, Transmission Systems, Numbering Plan, Charging Plan, Signaling Techniques, In channel signaling, common channel signaling, Cellular mobile telephony.

Unit 5 Data networks: Data transmission in PSTNs, Modems, ISO-OSI/TCP-IP Reference Model, Satellite based data networks, Data network standards (ISDN, DSL / ADSL, Token Ring, Token BUS , Bluetooth , WLAN, ZigBee, SONET / SDH).

Text Book :

1. Thiagarajan Vishwanathan, "Telecommunication Switching Systems and Networks"; PHI Publications.

Reference Books:

1. J. E. Flood, "Telecommunications Switching, Traffic and Networks", Pearson Education.
2. John C. Bellamy, "Digital Telephony", Third Edition; Wiley Publications

Course Outcomes

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

- CO1. Describe fundamentals of telecommunication systems and associated technologies
- CO2. Design multi stage switching structures involving time and space switching stages
- CO3. Analyze and evaluate the fundamental telecommunication traffic models.
- CO4. Examine the working of Telephone Networks.
- CO5. Demonstrate broad knowledge of fundamental principles and technical standards underlying Data Networks.

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VI Semester (Department of Electronics Engineering)

Syllabus of Open Category Courses

Open Category Course

Intelligent Control (OC-1)

Embedded Systems (OC-2)

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B.Tech. VI Semester (Electronics Engineering/Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/ week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
	OC-1	Intelligent Control	70	20	10	-	-	100	2	-	-	2

Intelligent Control

Course Objectives: The main objective of this course is to develop the basic understanding of an Intelligent control i.e. control system with optimization and prediction using Artificial Neural Network to the students.

Unit 1 - Adaptive Control: Introduction, Close loop and open loop adaptive control, Self-tuning controller, Parameter estimation using least square and recursive least square techniques, Gain Scheduling, Model Reference Adaptive Control.

Unit 2- Artificial Neural Network (ANN) Based Control: Introduction to ANN, Different activation functions, Different architectures and different learning methods, Back Propagation and Radial Basis Function networks.

Unit 3- Modeling of Control System: Representation and identification, Modeling the plant, Control structures – supervised control, Model reference control, Internal model control, Predictive control, Indirect and direct adaptive controller design using neural network.

Unit 4- Fuzzy Logic Based Control: Introduction to crisp sets and fuzzy sets, basic fuzzy set operation, Introduction to fuzzy logic modeling and control of a system, basic construction of fuzzy controller – fuzzy PI, PD and PID controller.

Unit 5- Genetic Algorithm/Hybrid Control: Basic concept of Genetic Algorithm (GA) and detailed algorithm steps, adjustment of free parameters, Solution of typical control problems using Genetic Algorithm.

Text Books:

1. Astrom .K, Adaptive Control, Second Edition, Pearson Education Asia Pvt. Ltd, 2002.
2. Shivanandan, Introduction to Artificial Neural Network with MATLAB 6.0.1, Third Edition, Mcgraw Hill India Ltd, 2015.
3. T. J. Ross, Fuzzy logic with Fuzzy Applications, Mc Graw Hill Inc, 1997.

Reference Books:

1. Klir G.J and Folger T.A, Fuzzy sets, Uncertainty and Information, Prentice Hall of India, New Delhi 1994.
2. N.K. Bose and P. Liang, Neural Network fundamentals with graphs, algorithms and applications, Mc Graw Hill, 1996.
3. Chang C. Hong, Tong H. Lee and Weng K. Ho, Adaptive Control, ISA press, Research Triangle Park, 1993.
4. David E. Goldberg, Genetic Algorithms.

Course Outcomes:

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

- CO1. **Explain** the fundamental principle behind adaptive control.
- CO2. **Estimate** various parameter of control system using artificial neural network.
- CO3. **Apply** the concept of artificial neural network to the field of control.
- CO4. **Optimize** the throughput of the system using optimization methods like Genetic algorithm.
- CO5. **Design** fuzzy logic based control system.

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B.Tech. VI Semester (Electronics Engineering/Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/ week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
	OC-2	Embedded Systems	70	20	10	-	-	100	2	-	-	2

Embedded Systems

Course objectives: To introduce the basic concepts of microcontroller and to develop assembly language programming skills along with the introduction of microcontroller applications.

Unit I Introduction: Embedded system architecture, classification, challenges and design issues, fundamentals of embedded processor and microcontrollers, Von Neumann/Harvard architectures, CISC vs. RISC, microcontrollers types and their selection, Overview of the 8051 family, architecture, pin description, Flags, Register Banks, Internal Memory Organization, I/O configuration, Special Function Registers, addressing modes.

Unit II Assembly programming and instruction of 8051: An Overview of 8051 instruction set, Introduction to 8051 assembly programming, Assembling and running an 8051 program, Data types and Assembler directives, Arithmetic, logic instructions and programs, Jump, loop and call instructions, IO port programming.

Unit III 8051 Timer, Serial port, interrupt Programming: Basics of Timers/Counters, Programming 8051 timers/Counter, basics of serial communication, 8051 connection to RS232, 8051 serial port programming, basics of 8051 Interrupts, 8051 interrupts programming: Timer interrupts, external hardware interrupts and serial communication interrupt, 8051 Interrupt priority.

Unit IV Interfacing real world devices with 8051 microcontroller: Memory address decoding, 8051 interfacing with memory, 8051 interface with 8255 PPI and various interfacings like: LCD and Matrix Keyboard interfacing with 8051 microcontroller, ADC, DAC and Temperature Sensor interfacing with 8051 microcontroller, Stepper motor interfacing.

Unit V Interfacing real world devices with Arduino : Overview of Arduino, Configuration, Interfacing, Board layout, Atmega328 specifications, Interfacing of Arduino with LED, Switches, Light dependent resistor (LDR), PWM, 16*2 LCD, Serial, L293D for motor interfacing, ADC.

Text Book:

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. Mckinlay, "The 8051 Microcontroller and Embedded Systems using Assembly and C" Pearson Education India, 2nd Edition


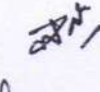

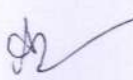




Reference Books:

1. Kenneth Ayal, "The 8051 Microcontroller", Architecture, Programming and Applications.
2. Subrata Ghoshal, "Embedded Systems and Robots, Projects using the 8051Microcontroller".

Course Outcomes

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

- CO1. Explain the architecture of embedded system and 8051.
- CO2. Develop assembly language programming skills for 8051.
- CO3. Analyze the concept of Timers/Counters, Serial communication and interrupt handling processes of 8051 microcontroller.
- CO4. Interface memory and I/O devices with 8051 microcontroller.
- CO5. Interface Arduino with LED, Switches, Light dependent resistor (LDR), PWM, 16*2 LCD, Serial, L293D for motor interfacing, ADC.

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Subject Name: Satellite and Radar Communication Systems

Course Outcomes

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

- CO1. Explain basic concepts and terminologies of satellite communication.
- CO2. Calculate the link power budget.
- CO3. Analyze the different multiple Access schemes for Satellite communication.
- CO4. Classify different propagation effects in satellite.
- CO5. Distinguish different satellite system.
- CO6. Describe the Satellite broadcasting systems.

Subject Name: Wireless and Adhoc Networks

Course Outcomes:

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

- CO1. Describe the adhoc networks characteristics and adhoc mobility models.
- CO2. Discuss the challenges in designing MAC routing protocol and their schedule algorithm, IEEE standards.
- CO3. Illustrate the types of routing protocols used for unicast and multicast routing also Hybrid, Energy aware routing algorithm.
- CO4. Classify the Transport layer and its protocols, network security solution and routing mechanism.
- CO5. Discuss Cross Layer Design and Integration of Ad Hoc for 4G.

Subject Name: Microcontroller and Embedded Systems

Course Outcomes

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

- CO1. Explain the architecture of embedded system and 8051.
- CO2. Develop assembly language programming skills for 8051.
- CO3. Analyze the concept of Timers/Counters, Serial communication and interrupt handling processes of 8051 microcontroller.
- CO4. Interface memory and I/O devices with 8051 microcontroller.
- CO5. Interface Arduino with LED, Switches, Light dependent resistor (LDR), PWM, 16*2 LCD, Serial, L293D for motor interfacing, ADC.

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Department of Electronics Engineering

Branch: Electronics Engineering/ Electronics and Telecommunication Engineering

Item 7 of BOS Agenda is written below with discussion to the BOS member:

Item 7:	To prepare and recommend the Experiment list/ Lab manual for Laboratory Courses to be offered in VII semester
	The Experiment list/ Lab manual for Laboratory Courses to be offered in VII semester have been recommended.

VLSI Design Lab (Lab-1)

Course Objectives

To learn the fundamental principles of CMOS VLSI circuit design using SYMICA EDA CAD tool.

List of Experiments:

Digital CMOS logic circuit design using SYMICA CAD tool:

1. Write and simulate basic CMOS logic Gates: AND, OR, NOT.
2. Write and simulate CMOS logic universal gates: NAND and NOR.
3. Write and simulate CMOS logic 2:1 MUX.
4. Write and simulate CMOS logic 2 x 4 Decoder.
5. Write and simulate CMOS logic Half-Adder and Full Adder.
6. Write and simulate CMOS logic RS, JK and D flip-flops.

Gate level design using SYMICA CAD tool:

1. Write and simulate a Verilog program for the following combinational designs:
 - a) 2 to 4 decoder
 - b) 8 to 1 multiplexer
 - c) 4 bit binary to gray converter
2. Write and simulate a Verilog code to describe the functions of a full adder using three modeling styles.
3. Write and simulate a model for 32 bit ALU.

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DEPARTMENT OF ELECTRONICS ENGINEERING

Branch: Electronics Engineering/ Electronics and Telecommunication Engineering

Item 8 of BOS Agenda is written below with discussion to the BOS member:

Question Paper CO Analysis - End Semester May-June 2019

Year	Course Code	Course Name	CO						Remarks
			CO1	CO2	CO3	CO4	CO5	CO6	
2 nd Year	130304	Analog Electronics	-	-	-	-	-	-	CO not mapped in Question Paper
	200404	Stochastic Processes	20	20	20	20	20	-	OK
	140403/200403	Communication Network	17	2.8	20	20	22.8	17.4	CO2 not properly mapped
	140401/200401/ BELL/BETL-402/ ELL-405	Electronics-II	20	20	20	11.4	8.6	20	OK
	140303/200303	Network Theory	8.57	11.43	20	20	20	20	OK
	140402/200402	Analog communication	4.7	27.2	8.1	20	20	20	CO1 not properly mapped
	BELL/BETL-405	Signals & Systems	16.67	23.33	20	10.5	9.5	20	OK
	BELL/BETL-404	Network Synthesis & Filter Design	7.6	12.4	20	20	20	20	CO1 not properly mapped
3 rd Year	BELL/BETL/ELL-601	Antenna & Wave Propagation	13.3	6.67	20	-	40	20	CO4 not mapped
	BELL/BETL/ELL-605	Industrial Electronics	9.5	30.5	20	20	4.5	15.5	CO5 not properly mapped
	BETL/ELL-603	Data Communication	17.1	22.8	20	15.7	16.6	7.8	CO6 not properly mapped
	BELL/BETL/ELL-602	Digital Signal Processing	20	20	20	20	10.5	9.5	OK
	BETL/BELL/ELL-604	Electronics System Design	20	20	20	20	-	-	CO is not defined for Q-5

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4 th Year	BELL/BETL/ELL-702	Microwave Engineering	20	10	10	20	20	20	OK
	BELL/BETL/ELL-705	ATM Network	20	20	20	20	20	-	OK
	BELL/BETL/ELL-704	VLSI Design	-	-	-	-	-	-	CO not mapped in Question Paper
	BELL/BETL/ELL-703	Cellular Mobile Communication	13.33	26.67	20	6.67	13.33	20	CO4 not properly mapped
	BELL/BETL-701	Advanced Control System	20	20	20	2.8	17.2	20	CO4 not properly mapped
	BETL/ELL-801	Fiber Optics & Optical communication	20	20	9.5	12.3	18.2	20	OK
	BETL/ELL-802	Satellite Communication	6.67	20	20	20	20	13.33	CO1 not properly mapped
	BETL/ELL-803	TV & Radar Engineering	20	40	-	-	26.67	13.33	CO3 and CO4 not mapped in Question Paper
	BELL/BETL/ELL-804	Neural Network & Fuzzy Systems	4.28	6.19	26.19	23.33	14.28	16.66	CO1 and CO2 not mapped properly
	BELL/ELL-710	CMOS technology	-	-	-	-	-	-	CO not mapped in Question Paper

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Question Paper Analysis on the basis of difficulty level-End Semester May-June 2019

* Note: Percentage of choice is 33% as per RGPV norms.

Year	Course Code	Course Name	% of Numerical & Theoretical Questions	% of Questions			Remark
				Easy	Moderate	Difficult	
2 nd Year	130304	Analog Electronics	18.1 & 81.9	32.6	43.8	23.6	Less Numerical problems
	200404	Stochastic Processes	34.28 & 65.72	20	63.8	16.2	OK
	140403/200403	Communication Network	40.9 & 59.1	51.42	28.57	20.01	OK
	140401/200401/ BELL/BETL-402/ ELL-405	Electronics-II	21.9 & 78.1	26.67	48.57	24.76	Less Numerical problems
	140303/200303	Network Theory	30.5 & 69.5	20.9	65.57	13.33	Less Numerical problems
	140402/200402	Analog communication	31.4 & 68.6	26.67	60	13.33	Less Numerical problems
	BELL/BETL-405	Signals & Systems	59 & 41	20	33.33	46.67	OK
	BELL/BETL-404	Network Synthesis & Filter Design	20 & 80	41.9	38.1	20	Less Numerical problems
3 rd Year	BELL/BETL/ELL-601	Antenna & Wave Propagation	20 & 80	28.57	51.43	20	Less Numerical problems
	BELL/BETL/ELL-605	Industrial Electronics	26.67 & 73.33	30.5	47.6	21.9	Less Numerical problems
	BETL/ELL-603	Data Communication	16.2 & 83.8	40.9	28.5	30.4	Less Numerical problems
	BELL/BETL/ELL-602	Digital Signal Processing	74.28 & 25.72	21.9	58.1	20	OK
	BETL/BELL/ELL-604	Electronics System Design	36.2 & 63.8	27.62	52.38	20	OK
4 th Year	BELL/BETL/ELL-702	Microwave Engineering	22.8 & 77.2	40	53.33	6.67	Less Numerical problems
	BELL/BETL/ELL-705	ATM Network	00 & 100	63.8	36.2	00	No Numerical problem/ Theoretical Subject

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BELL/BETL/ELL-704	VLSI Design	16.2 & 83.8	52.4	22.8	24.8	Theoretical Subject
BELL/BETL/ELL-703	Cellular Mobile Communication	33.33 & 66.67	23.8	47.6	28.6	OK
BELL/BETL-701	Advanced Control System	40 & 60	18.1	33.33	48.57	OK
BETL/ELL-801	Fiber Optics & Optical communication	12.4 & 87.6	14.2	47.6	38.2	Less Numerical problems
BETL/ELL-802	Satellite Communication	26.67 & 73.33	33.33	45.71	20.96	OK
BETL/ELL-803	TV & Radar Engineering	0 & 100	47.6	27.6	24.8	No Numerical Problem
BELL /BETL/ELL-804	Neural Network & Fuzzy Systems	41.9&58.1	18.1	21.9	60	OK/ Tough paper
BELL/ELL-710	CMOS technology	20 & 80	57.1	19	23.9	OK/ Theoretical Subject

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Question Paper Analysis on the basis of difficulty level–Mid Semester-1(Jan-June 2019)

* Note: Percentage of choice is 33% as per RGPV norms.

Semester	Course Code	Course Name	% of Numerical & Theoretical Questions	% of Questions			Remark
				Easy	Moderate	Difficult	
IV SEM	200404	Stochastic Processes	93.75 & 6.25	25	37.5	37.5	OK
	140403/200403	Communication Network	56.25 & 43.75	81.25	18.75	0	OK
	140401/200401/ BELL/BETL-402/ ELL-405	Electronics-II	50 & 50	25	25	50	OK
	140402/200402	Analog communication	50 & 50	18.75	43.75	37.5	OK
	140404	Electronics Measurement & Instrumentation	43.75 & 56.25	37.5	25	37.5	OK
VI SEM	BELL/BETL/ELL-601	Antenna & Wave Propagation	12.5 & 87.5	25	43.75	12.5	Missing option in Q.4/ Less numerical
	BELL/BETL/ELL-605	Industrial Electronics	56.25 & 43.75	25	56.25	18.75	OK
	BETL/ELL-603	Data Communication	18.75 & 81.25	31.25	50	18.75	Less numerical
	BELL/BETL/ELL-602	Digital Signal Processing	75 & 25	25	37.5	37.5	OK
	BETL/BELL/ELL-604	Electronics System Design	43.75 & 56.25	25	37.5	37.5	OK
VIII SEM	BETL/ELL-801	Fiber Optics & Optical communication	18.75 & 81.25	62.5	18.75	18.75	Less numerical
	BETL/ELL-802	Satellite Communication	93.75 & 6.25	31.25	31.25	37.5	OK
	BETL/ELL-803	TV & Radar Engineering	56.25 & 43.75	62.5	18.75	18.75	OK
	BELL /BETL/ELL-804	Neural Network & Fuzzy Systems	37.5 & 62.5	25	0	75	Tough paper

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Question Paper Analysis on the basis of difficulty level–Mid Semester-II (Jan-June 2019)

* Note: Percentage of choice is 33% as per RGPV norms.

Semester	Course Code	Course Name	% of Numerical & Theoretical Questions	% of Questions			Remark
				Easy	Moderate	Difficult	
IV SEM	200404	Stochastic Processes	93.75 & 6.25	25	37.5	37.5	OK
	140403/200403	Communication Network	56.25 & 43.75	18.75	62.5	18.75	OK
	140401/200401/ BELL/BETL-402/ ELL-405	Electronics-II	0 & 100	62.5	37.5	0	No numerical/ Easy paper
	140402/200402	Analog communication	12.5 & 87.5	12.5	50	37.5	Less numerical
	140404	Electronics Measurement & Instrumentation	37.5 & 62.5	18.75	43.75	37.5	OK
VI SEM	BELL/BETL/ELL-601	Antenna & Wave Propagation	37.5 & 62.5	50	50	-	Less Numerical problems/ Easy paper
	BELL/BETL/ELL-605	Industrial Electronics	37.5 & 62.5	50	31.25	18.75	OK
	BETL/ELL-603	Data Communication	18.75 & 81.25	62.5	37.5	-	Easy paper
	BELL/BETL/ELL-602	Digital Signal Processing	68.75 & 31.25	31.25	50	18.75	CO not mapped
	BETL/BELL/ELL-604	Electronics System Design	18.75 & 81.25	25	56.25	18.75	Less Numerical
VIII SEM	BETL/ELL-801	Fiber Optics & Optical communication	18.75 & 81.25	50	50	-	Less Numerical problems/ Easy paper
	BETL/ELL-802	Satellite Communication	31.25 & 68.75	37.5	50	12.5	OK
	BETL/ELL-803	TV & Radar Engineering	18.75 & 81.25	50	31.25	18.75	Less Numerical
	BELL /BETL/ELL-804	Neural Network & Fuzzy Systems	0 & 100	12.5	50	37.5	No numerical problems

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Question Paper Analysis on the basis of difficulty level –End Semester May-June 2019

PG : Microwave Engineering

Communication Control & Networking

* Note: Percentage of choice is 33% as per RGPV norms.

S. No.	Course Code	Course Name	% of Numerical & Theoretical Questions	% of Questions			Remark
				Easy	Moderate	Difficult	
1	600202/MCCL-922/CCN-2402	Digital Control System	62.8 & 37.2	11.4	28.5	60.1	OK
2	600201/MCCL-924/CCN-2404	Advanced Microprocessor & Embedded Systems	10 & 90	14.2	77.1	8.7	OK
3	610202/MMWL-922/MW-2412	Microwave Measurement	12.4 & 87.6	28.5	58.1	13.4	Less Numerical problems
4	610201/MMWL-921/MW-2411	Antenna theory	43.8 & 56.2	14.2	42.8	43	OK
5	600203/610205/MCCL-923/MMWL-925/MW/CCN-2403	Information & Coding Theory	55.2 & 44.8	11.4	21.9	66.7	OK
6	600103/610105/MCCL-914/MMWL-913/MW/CCN-1413	R.F Circuits	44.8 & 55.2	20.9	52.3	26.8	OK
7	600204/610204/MCCL-924/MMWL-924	Microwave Circuits Design	60 & 40	29.5	34.2	36.3	OK
8	600301/610301/MCCL-931/MMWL/MW/CCN-3401	Advanced Communication Systems	19 & 81	25.7	67.62	6.64	Less Numerical problems
9	610103/MMWL-915/MW-1412	Advanced Electromagnetic	20 & 80	66.67	26.67	6.66	Less Numerical problems
10	600205/610203/MCCL-925/MMWL-923/MW/CCN-2409	Digital Signal Processing	59 & 41	21.91	49.52	28.57	OK

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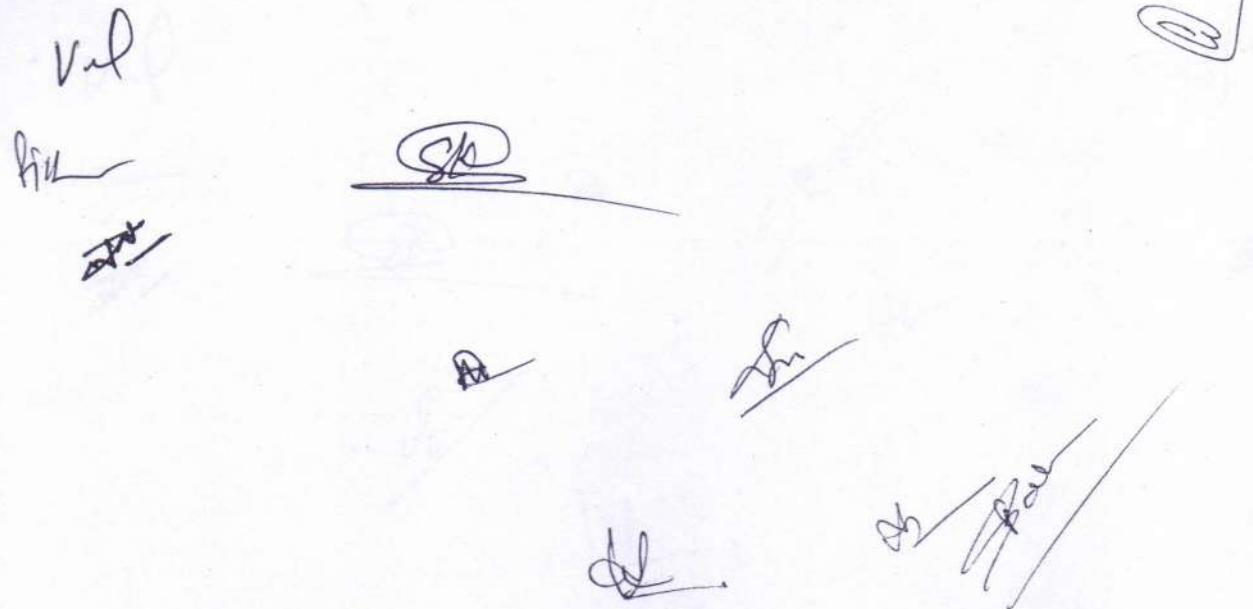
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Question Paper Analysis on the basis of difficulty level –Mid Semester-1 (Jan-June 2019)

* Note: Percentage of choice is 33% as per RGPV norms.

S. No.	Course Code	Course Name	% of Numerical & Theoretical Questions	% of Questions			Remark
				Easy	Moderate	Difficult	
1.	600202/MCCL-922/CCN-2402	Digital Control System	56.25 & 43.75	12.5	62.5	25	OK
2.	600201/MCCL-924/CCN-2404	Advanced Microprocessor & Embedded Systems	18.75 & 81.25	18.75	43.75	37.5	Less Numerical Problems
3.	610201/MMWL-921/MW-2411	Antenna theory	50 & 50	12.5	50	57.5	OK
4.	MW-610202	Microwave Measurement	0 & 100	62.5	37.5	-	Easy Paper
5.	600203/610205/MCCL-923/MMWL-925/MW/CCN-2403	Information & Coding Theory	43.75 & 56.25	6.25	37.5	56.25	OK
6.	600204/610204/MCCL-924/MMWL-924	Microwave Circuits Design	37.5 & 62.5	25	56.25	18.75	OK
7.	600205/610203//MMWL 923 /MW/CCN-2409	Digital Signal Processing	25 & 75	31.25	50	18.75	Less numerical



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DEPARTMENT OF ELECTRONICS ENGINEERING

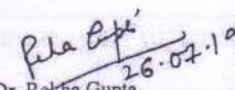
ACTION TAKEN

- Though Question Paper is a confidential document, a general faculty meeting has been conducted to discuss the question paper analysis report. Faculty members were briefed about issues like some paper were easy, having less numerical problems and COs were not properly mapped.
- Faculty members were also briefed about the BLOOM's taxonomy and rules regarding CO mapping.
- A copy of End semester question paper analysis has been provided to Exam Controller for further needful actions.


Awadhesh Gupta


Arpita Singhal


Dr. Vandana Vikas Thakre


Dr. Rekha Gupta
26.07.19
(HoD)

Department of Electronics Engineering

Item 9 of BOS Agenda is written below with discussion to the BOS member;

Item 9:	To identify gaps in CO attainment levels for Jan-June 2019 semester and propose corrective measures for improvement.
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CO Attainment Targets for Jan-June 2019

Semester - 4	*140402/*200402 Electronics – II	CO1	Analyze the characteristics of an amplifier.	60
		CO2	Design the tuned amplifier with the given parameters.	60
		CO3	Compare various power amplifiers.	60
		CO4	Design the multistage amplifiers.	60
		CO5	Design the various electronics circuits using Operational amplifier.	60
		CO6	Design the active filters based on given specifications.	60
	*140403/*200403 Analog Communication	CO1	Apply the concept of multiplexing and modulation in communication engineering.	60
		CO2	Analyze the amplitude modulation and angle modulation with their waveforms	60
		CO3	Explain the generation and detection for various modulation techniques.	60
		CO4	Explain the working of transmitter and receiver	60
		CO5	Evaluate the statistical parameters for general PDF/CDF	60
		CO6	Evaluate the effects of noise on different modulation techniques	60
	*140404/*200404 Communication Networks	CO1	Compute the various parameters of different passive networks.	60
		CO2	Design the symmetrical and asymmetrical attenuators.	60
		CO3	Synthesize the network for a given positive and minimum positive real function.	60
		CO4	Design passive filters for the given specifications.	60
		CO5	Analyze the characteristics of various transmission lines.	60
		CO6	Calculate the impedance and SWR graphically /analytically.	60
	*140405 Electronics Measurement and Instrumentation	CO1	Discuss various performance characteristics of an instrument	60
		CO2	Explain the working principle and applications of various bridges in measurement.	60
		CO3	Differentiate various transducers	60
		CO4	Analyze the working principle of various digital instruments and display devices.	60

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Semester - 6	*200405 Stochastic Process	CO5	Measure different parameters using various CROs.	60
		CO6	Design the A/D and D/A converter.	60
		CO1	Analyze the different probability distribution functions.	60
		CO2	Calculate Statistical parameters.	60
		CO3	Perform transformation of random variables.	60
		CO4	Analyze joint distribution of continuous and discrete random variables.	60
		CO5	Classify strict sense stationary and wide sense stationary random processes	60
	CO6	Analyze the behavior of LTI system with random processes.	60	
	BELL/BETL 601 Antenna and Wave Propagation	CO1	Analyze the radiation characteristics of dipole antennas of various lengths.	60
		CO2	Evaluate various parameters of the antenna.	60
		CO3	Design antenna array for the given radiation characteristics.	60
		CO4	Analyze the effect of earth on antenna radiation properties.	60
		CO5	Analyze the design parameters, radiation mechanism, and applications of various practical antennas.	60
CO6		Describe effects of earth and its atmosphere on radio wave propagation.	60	
BELL/BETL 602 Digital Signal Processing	CO1	Differentiate between continuous and discrete time signal & systems.	60	
	CO2	Analysis of discrete time systems using z-transform.	60	
	CO3	Design of simple digital filters by placing poles and zeros and their structure implementation.	60	
	CO4	Compute discrete Fourier transform and its efficient implementation using fast algorithm.	60	
	CO5	Design of Linear Phase FIR filters.	60	
	CO6	Design IIR filter to meet specified magnitude/phase response characteristics	60	
BELL/BETL 603 Data Communication	CO1	Explain the evolution of computer network and basic concepts of data communication system	60	
	CO2	Describe the services of the DATA link layer provided in controlling transmission errors and flow of data	60	
	CO3	Analyze the various techniques to alleviate the problem of medium allocation in broadcast network like ALOHA, CSMA etc.	60	
	CO4	Explain the principle and protocol for route calculation and be able to perform such calculation in Network layers	60	
	CO5	Explain the services and features of transport layer of data networks	60	
	CO6	Describe the skills of synchronization in data communication	60	

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Semester - 8	BELL/BETL 604 Electronics System Design	CO1	Design regulated power supply.	60
		CO2	Design single stage and multi stage amplifier using BJT.	60
		CO3	Design oscillators using BJT.	60
		CO4	Design of the basic Op-Amp Circuits.	60
		CO5	Design digital circuits such as flip slop, registers, and counters.	60
		CO6	Design analog to digital converter and digital to analog converter.	60
	BELL/BETL 605 Industrial Electronics	CO1	Analyze the characteristics of different power semiconductor devices.	60
		CO2	Design phase controlled rectifier circuits.	60
		CO3	Design inverter and chopper circuits.	60
		CO4	Analyze different cyclo converters & AC voltage controllers with their applications.	60
		CO5	Express the principle of different types of recordings.	60
		CO6	Characterize the concept of microphones and speakers.	60
	BELL/BETL 801 Fiber optics & optical communication	CO1	Learn the basic elements of optical fiber transmission link, fiber modes configurations and fabrication techniques.	65
		CO2	Classify various optical sources, fiber splicing techniques, optical connectors with their principles	65
		CO3	Analyze different optical receivers and their noise performances	65
		CO4	Calculate the channel impairments like losses and dispersion	65
		CO5	Discuss Coherent optical transmission system, the installation and performance verification of digital optical fiber link	65
		CO6	Discriminate between different amplifiers and learn variety of networking aspects, FDDI, SONET, WDM	65
BELL/BETL 802 Satellite Communication		CO1	Explain basic concepts and terminologies of satellite communication	65
		CO2	Calculate the link power budget.	65
		CO3	Analyze the different multiple Access schemes for Satellite communication.	65
		CO4	Classify different Propagation effects in satellite	65
		CO5	Solve problems related to channel coding techniques.	65
		CO6	Distinguish different satellite system	65
BELL/BETL 803 TV and RADAR Engg.	CO1	Explain the various components of the composite video signal, TV camera tube, and picture tube.	60	
	CO2	Characterize various types of monochrome and color television systems.	60	
	CO3	Analyze basic factors required for successful transmission and reception of TV signals.	60	
	CO4	Explain the advanced topics in digital television and High definition television.	60	

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CO Attainment for Jan-June 2019

Semester - 4	*140402/*200402 Electronics – II	CO1	Analyze the characteristics of an amplifier.	54
		CO2	Design the tuned amplifier with the given parameters.	79
		CO3	Compare various power amplifiers.	66
		CO4	Design the multistage amplifiers.	62
		CO5	Design the various electronics circuits using Operational amplifier.	64
		CO6	Design the active filters based on given specifications.	58
	*140403/*200403 Analog Communication	CO1	Apply the concept of multiplexing and modulation in communication engineering.	70
		CO2	Analyze the amplitude modulation and angle modulation with their waveforms	60
		CO3	Explain the generation and detection for various modulation techniques.	41
		CO4	Explain the working of transmitter and receiver	67
		CO5	Evaluate the statistical parameters for general PDF/CDF	62
		CO6	Evaluate the effects of noise on different modulation techniques	76
	*140404/*200404 Communication Networks	CO1	Compute the various parameters of different passive networks.	72
		CO2	Design the symmetrical and asymmetrical attenuators.	71
		CO3	Synthesize the network for a given positive and minimum positive real function.	66
		CO4	Design passive filters for the given specifications.	74
		CO5	Analyze the characteristics of various transmission lines.	74
		CO6	Calculate the impedance and SWR graphically /analytically.	75
	*140405 Electronics Measurement and Instrumentation	CO1	Discuss various performance characteristics of an instrument	75
		CO2	Explain the working principle and applications of various bridges in measurement.	77
		CO3	Differentiate various transducers	58
		CO4	Analyze the working principle of various digital instruments and display devices.	62
		CO5	Measure different parameters using various CROs.	81
		CO6	Design the A/D and D/A converter.	28
	*200405 Stochastic Process	CO1	Analyze the different probability distribution functions.	79
		CO2	Calculate Statistical averages.	50
		CO3	Evaluate transformation of random variables.	64
		CO4	Classify random processes	37
		CO5	Analyze the behavior of LTI system with random	48

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Semester - 6	BELL/BETL 601 Antenna and Wave Propagation		processes.	
		CO1	Analyze the radiation characteristics of dipole antennas of various lengths.	57
		CO2	Evaluate various parameters of the antenna.	69
		CO3	Design antenna array for the given radiation characteristics.	58
		CO4	Analyze the effect of earth on antenna radiation properties.	33
		CO5	Analyze the design parameters, radiation mechanism, and applications of various practical antennas.	77
		CO6	Describe effects of earth and its atmosphere on radio wave propagation.	81
	BELL/BETL 602 Digital Signal Processing	CO1	Differentiate between continuous and discrete time signal & systems.	54
		CO2	Analysis of discrete time systems using z-transform.	54
		CO3	Design of simple digital filters by placing poles and zeros and their structure implementation.	45
		CO4	Compute discrete Fourier transform and its efficient implementation using fast algorithm.	31
		CO5	Design of Linear Phase FIR filters.	37
		CO6	Design IIR filter to meet specified magnitude/phase response characteristics	30
	BELL/BETL 603 Data Communication	CO1	Explain the evolution of computer network and basic concepts of data communication system	43
		CO2	Describe the services of the DATA link layer provided in controlling transmission errors and flow of data	42
		CO3	Analyze the various techniques to alleviate the problem of medium allocation in broadcast network like ALOHA, CSMA etc.	47
		CO4	Explain the principle and protocol for route calculation and be able to perform such calculation in Network layers	50
		CO5	Explain the services and features of transport layer of data networks	43
		CO6	Describe the skills of synchronization in data communication	30
	BELL/BETL 604 Electronics System Design	CO1	Design regulated power supply.	83
		CO2	Design single stage and multi stage amplifier using BJT.	69
		CO3	Design oscillators using BJT.	78
		CO4	Design of the basic Op-Amp Circuits.	76
		CO5	Design digital circuits such as flip slop, registers, and counters.	59
CO6		Design analog to digital converter and digital to analog converter.	52	
BELL/BETL 605 Industrial	CO1	Analyze the characteristics of different power semiconductor devices.	37	

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	Electronics	CO2	Design phase controlled rectifier circuits.	40
		CO3	Design inverter and chopper circuits.	26
		CO4	Analyze different cyclo converters & AC voltage controllers with their applications.	26
		CO5	Express the principle of different types of recordings.	25
		CO6	Characterize the concept of microphones and speakers.	31
		Semester - 8	BELL/BETL 801 Fiber optics & optical communication	CO1
CO2	Classify various optical sources, fiber splicing techniques, optical connectors with their principles			81
CO3	Analyze different optical receivers and their noise performances			41
CO4	Calculate the channel impairments like losses and dispersion			61
CO5	Discuss Coherent optical transmission system, the installation and performance verification of digital optical fiber link			43
CO6	Discriminate between different amplifiers and learn variety of networking aspects, FDDI, SONET, WDM			31
BELL/BETL 802 Satellite Communication	CO1		Explain basic concepts and terminologies of satellite communication	64
	CO2		Calculate the link power budget.	48
	CO3		Analyze the different multiple Access schemes for Satellite communication.	46
	CO4		Classify different Propagation effects in satellite	67
	CO5		Solve problems related to channel coding techniques.	40
	CO6		Distinguish different satellite system	83
BELL/BETL 803 TV and RADAR Engg.	CO1		Explain the various components of the composite video signal, TV camera tube, and picture tube.	55
	CO2		Characterize various types of monochrome and color television systems.	86
	CO3		Analyze basic factors required for successful transmission and reception of TV signals.	77
	CO4		Explain the advanced topics in digital television and High definition television.	94
	CO5		Evaluate the various performance factors related to the RADAR.	76
	CO6		Explain target detection and tracking using radar systems.	82
BELL/BETL 804 Neural Network and Fuzzy systems	CO1		Explain the basic concepts of neural networks	71
	CO2		Analyze the concept of human neural structure & ANN.	66
	CO3		Analyze the various feed forward/ feedback neural networks.	60
	CO4		Examine different learning methodologies.	57
	CO5		Explain the concept of fuzziness involved in various	54

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			systems and fuzzy set theory. .	
		CO6	Analyze the application of fuzzy logic control to real time systems.	60

Department of Electronics Engineering

List of subjects and their CO whose target level is not achieved (Session Jan-June 2019)

Semester	Subject Name	CO attainment (TARGET NOT ACHIEVED)	Action Taken
IV	*140402/*200402 Electronics – II	CO1, CO6	<ul style="list-style-type: none"> • Additional Classes which will focused on specific CO • More tutorials • Solutions of previous year question papers
	*140403/*200403 Analog Communication	CO3	
	*140405 Electronics Measurement and Instrumentation	CO3, CO6	
	*200405 Stochastic Process	CO2, CO4, CO5	
VI	BELL/BETL 601 Antenna and Wave Propagation	CO1, CO3, CO4	<ul style="list-style-type: none"> • Additional classes by expert • Take care of CO distribution during question paper setting • Better attainment of these CO can be achieved by improving their weightage in question paper • In house workshop for CO revision and question paper setting
	BELL/BETL 602 Digital Signal Processing	All CO	
	BELL/BETL 603 Data Communication	All CO	
	BELL/BETL 604 Electronics System Design	CO5, CO6	
	BELL/BETL 605 Industrial Electronics	All CO	
VIII	BELL/BETL 801 Fiber optics & optical communication	CO1, CO3, CO5, CO6	<ul style="list-style-type: none"> • In house workshop for CO revision and question paper setting
	BELL/BETL 802 Satellite Communication	CO2, CO3, CO5	
	BELL/BETL 803 TV and RADAR Engg.	CO1	
	BELL/BETL 804 Neural Network and Fuzzy systems	CO4, CO5	

Department of Electronics Engineering

Branch: Electronics Engineering/ Electronics and Telecommunication Engineering

Item 11 of BOS Agenda is written below with discussion to the BOS member;

Item 11:	To finalize the 'Collaborative Course' to be offered in VI semester (under DE Category) which is to be run jointly with industry person
	The 'Collaborative Course' to be offered in VI semester (under DE Category) which is to be run jointly with industry person has been finalized.

List of Departmental Electives (DEs) Collaborative Courses

S.No	Elective	Subject Code	Subject Name
1	Department Elective-1(DE-1)		**Optical Communication

** (Syllabus equivalent to one credit will be covered by industry person)

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

(Department of Electronics Engineering)

Date: 18/11/19

Panel of External Examiners for UG & PG Practical Exam

S. No.	Name of External Examiner	Designation	Postal Address	Contact No.
1.	Dr. S. Indu	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
2.	Dr. Asok De	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
3.	Dr. Rajeev Kapoor	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
4.	Dr. O. P. Verma	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
5.	Dr. N. S. Raghava	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
6.	Dr. Rajeshwari Pandey	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
7.	Dr. Neeta Pandey	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
8.	Dr. D. R. Bhaskar	Professor	Department of Electronics and Communication	



			Engineering, DTU Delhi - 110042	
9.	Dr. Dinesh Kumar	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
10.	Dr. Jeebananda Panda	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
11.	Dr. Rajesh Rohila	Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
12.	Dr. M. S. choudhary	Associate Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
13.	Dr. Gurjit Kaur	Associate Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
14.	Dr. Poornima Mittal	Associate Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
15.	Rajesh Birok	Associate Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
16.	Alok Kumar Singh	Associate Professor	Department of Electronics and Communication Engineering, DTU Delhi - 110042	
17.	Dr. Poonam Sinha	Associate Professor	Barkatullah University, Hoshangabad Road, Bhopal- 462026	9826871398
18.	Dr. S. N. Sharma	Associate Professor	Department of Electronics and Communication Engineering, SATI, Vidisha 464001	07592250356

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19.	Dr. Alok Jain	Professor	Department of Instrumentation, SATI, Vidisha, Netaji Subhash Marg, Civil Lines, Vidisha-464001(M.P.)	9425463116
20.	Dr. Shailendra Singh	Professor	NITTTR, Shamla Hills, Bhopal-462002	9425011658
21.	Dr. Aditya Trivedi	Professor	AVB IIITM Gwalior	
22.	Dr. K. V. Arya	Professor	AVB IIITM Gwalior	
23.	Dr. Jyoti Singhai	Professor	MANIT, Bhopal-462003	
24.	Dr. R. S. Tomar	Professor	LNMIT Jaipur	
25.	Dr. Rakesh Singhai	Professor	RGPV Airport Bypass Road, Gandhi Nagar, Bhopal-462036	9406540888
26.	Dr. D. K. shrivastav	Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH-25, Jhansi, 284128 (U.P.)	9415179133
27.	Dr. Neeraj Shrivastava	Associate Professor	Department of Electronics & Communication RJIT, Tekanpur	8989563787 9425754197
28.	Dr. Vivek Singh Kushwah	Associate Professor	Department of Electronics & Communication, AMITY University, Gwalior 474001 (M.P.)	8989563787
29.	Dr. S.K. Jain	Associate Professor	SGSITS, Indore	9993769632
30.	Dr. D. C. Dubkariya	Associate Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH-25, Jhansi, 284128 (U.P.)	9415194924
31.	Mr. Sunil Kumar Singh	Associate Professor	Jabalpur Engineering College, Gokalpur, Jabalpur-482011 (M.P.)	
32.	Dr. Vimalesh Singh	Associate Professor	Manav Rachna University, Faridabad, Haryana	
33.	Dr. Deepak Nagaria	Associate Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH-25, Jhansi, 284128 (U.P.)	9412903700
34.	Dr. Mahendra Kumar	Associate Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH-25, Jhansi, 284128 (U.P.)	9450079696
35.	Dr. Shahnaz Ayub	Associate Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH	9415587596

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36.	Sayoug Rawat	Associate Professor	Manipal University, Jaipur	Sayoug Eawat
37.	Dr. Ranjeet Singh	Associate Professor	ITM University Gwalior	Dr. Ranjeet Singh
38.	Rinkoo Bhatia	Associate Professor	Amity University Gwalior	Rinkoo Bhatia
39.	Dr. Sarthak Singhal	Assistant Professor	MNIT, Jaipur	Dr. Sarthak Singhal
40.	Dr. Anupam Vyas	Assistant Professor	BU, Jhansi	
41.	Mr. Amit Naik	Assistant Professor	SGSITS Indore	
42.	Mr. Dheeraj Singh Rajput	Assistant Professor	GEC Sagar	9584120261
43.	Dr. Sudhir Keshari	Assistant Professor	Govt. Engg. College Bharatpur	
44.	Dr. Ravi Gupta	Assistant Professor	Govt. Engg. College Bharatpur	
45.	Dr. Aruna Pathak	Assistant Professor	Govt. Engg. College Bharatpur	
46.	Mr. Puneet Narayan	Assistant Professor	Govt. Engg. College Bharatpur	
47.	Mr. Devendra Kumar	Assistant Professor	RJIT Tekanpur	9926882527
48.	Mr. Sandeep Agrawal	Assistant Professor	RJIT Tekanpur	
49.	Dr. Narendra Singh Beniwal	Assistant Professor	Bundelkhand Institute of Engineering and Technology, Kanpur Road, NH	9415179843
50.	Dr. G. S. Tomar	Ex-Director	THDC Institute of Hydro Power Engineering and Technology, Bhagirathipuram, Tehri, Govt. Of Uttarakhand 249124	9425744460

Panel of External Examiners for UG Practical Exam

1.	Mr. Mahendra Pandey	Assistant Professor	RJIT Tekanpur	9425122359
2.	Mr. Vikas Sharma	Assistant Professor	Rewa Engg. College Rewa	
3.	Mr. Gaurav Bharadwaj	Assistant Professor	RJIT Tekanpur	
4.	Mr. Amit Shrivastav	Assistant Professor	NRICEM Gwalior	
5.	Mr. Ashish Dubey	Assistant Professor	SRCEM Banmore	
6.	Mr. Gajendra	Assistant	SRITT Banmore	9827579912

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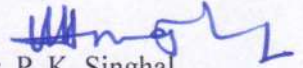
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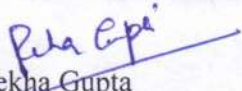
	Kulshreshtha	Professor		
7.	Mr. Ranjeet S. Bhadauria	Assistant Professor	IPS Gwalior	9926257872
8.	Mr. Manoj Ojha	Assistant Professor	SIMT Mathura	
9.	Mr. Vineet	Assistant Professor	ITM, GWALIOR	7898806424
10.	Mr. Kapil Jain	Assistant Professor	ITM, GWALIOR	
11.	Mr. Abhay Vidyarthi	Assistant Professor	ITM, GWALIOR	
12.	Prashant Badal	Assistant Professor	SRCEM Banmore	
13.	Ajay Dadoriya	Assistant Professor	Amity University Gwalior	
14.	Saurabh sharma	Assistant Professor	ITM, GWALIOR	



Dr. R. P. Narwaria
Examination committee Member



Dr. P. K. Singhal
Examination committee Member



Dr. Rekha Gupta
Examination committee Chairperson
Head, Department of Electronics

Dr. Manjaree Pandit
Dean Academics

Dr. R.K. Pandit
Director




25/11/19

