माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE

Department of Electronics Engineering

Board of Studies Meeting of Electronics Engineering (MITS-DU) Session: Jan-June 2026

The Board of Studies (BoS) meeting of the Electronics Engineering department was held on 3rd Dec 2025 at 11:30 AM onwards. Following external and internal members have attended online meeting through google link : https://meet.google.com/cmd-cesh-wju

External Member:

1. Dr. Yogendra Kumar Prajapati, Professor, Department of Electronics and Communication Engineering, MNNIT, Prayagraj, U.P.

Internal Member:

1. Dr. Laxmi Shrivastava, Professor & Head
2. Dr. R. P. Narwaria, Associate Professor
3. Dr. Madhav Singh, Assistant Professor
4. Dr.Vikas Mahor, Assistant Professor
5. Dr. Hemant Choubey, Assistant Professor
6. Dr. Varun Mishra, Assistant Professor
7. Dr. Mukesh Kumar Mishra, Assistant Professor
8. Dr. Kumar Gaurav, Assistant Professor
9. Dr. Shailendra Singh, Assistant Professor

Agenda of the BoS Meeting

Minutes should have a summary/cover page mentioning all the significant changes made in the following given format :

Courses where revision was carried out*

Course name	Course Code	Year/Date of introduction	Year/Date of revision	Percentage of content added or replaced	Agenda Item No.	Page No.	Link of relevant documents/minutes
Electronic Circuits	14251202	2024	2025	60%	Item 3	10	**Annexure-II**
Signals and System	14251203	2024	2025	20%	Item 3	11	**Annexure-II**
Digital Circuits and Systems	14251204	2024	2025	20%	Item 3	12	**Annexure-II**

New Courses added*

Course name	Course Code	Activities/contents which have a bearing on increasing skill and employability.	Agenda Item No.	Page No.	Link of relevant documents/minutes
Electronics Engineering Material	14251201	Materials used in PCB manufacturing, substrates, soldering materials, thermal interface materials	Item 3	9	**Annexure-II**
Wireless Communication	14242203	Perform simulation and performance evaluation using MATLAB/Python. Work with industry tools such as HFSS, NS-3, GNU Radio, SDR.	Item 6	31	**Annexure-V**
System Design using Verilog	14242205	Simulate, verify, synthesize, and implement designs on FPGA hardware.	Item 6	35	**Annexure-V**
System Design Lab using Verilog	14242208	Verilog modules using behavioral, dataflow, and structural modelling.	Item 6	39	**Annexure-V**
Wireless Communication Lab	14242207	MATLAB/Simulink for communication system simulation. GNU Radio for SDR implementations.NS-3 for network simulation.	Item 6	40	**Annexure-V**

BoS Agenda Items

Item 1	To confirm the minutes of previous BoS meeting held in the month of June 2025. *The minutes of previous BOS held on 3rd June 2025 has been finalized.*
Item 2	To review and finalize the scheme structure of **B. Tech./B.Arch. II semester** for the **Batch admitted in 2025-26** academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) structure. *The scheme structure of B.Tech. II semester for the Batch admitted in 2025-26underthe Madhav Institute of Technology & Science-Deemed University (MITS-DU) has been discussed and finalized.* **Annexure-I**
Item 3	To review and finalize the syllabi of all courses of UG programmes - **B. Tech. and B.Arch. II Semester** (**for batch admitted in 2025-26**)along with their COs and CO-PO/PSO matrix. *The syllabi for all courses of B. Tech II Semester (for batch admitted in 2025-26) under the flexible curriculum along with their COs has been discussed and finalized.* **Annexure-II**
Item 4	To review and finalize the **Experiment list/ Lab manual and project list under Micro Project-II** for all the Laboratory Courses to be offered in **UG programmes – B.Tech. and B.Arch. II Semester** (**for batch admitted in 2025-26**) along with their COs and CO-PO/PSO matrix. *The Experiment list/ Lab manual for all the Laboratory Courses and Micro Project-II to be offered in B.Tech. II semester has been discussed and finalized*. **Annexure-III**
Item 5	To review and finalize the scheme structure of **B.Tech./B.Arch. IV semester** for the **Batch admitted in 2024-25** academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) structure. *The scheme structure of B.Tech. IV semester for the Batch admitted in 2024-25underthe Madhav Institute of Technology & Science-Deemed University (MITS-DU) has been discussed and finalized.* **Annexure-IV**
Item 6	To review and finalize the syllabi of all courses of UG programmes - **B. Tech. and B.Arch. IV Semester** (**for batch admitted in 2024-25**)along with their COs and CO-PO/PSO matrix. *The syllabi for all courses of B. Tech IV Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs has been discussed and finalized.* **Annexure-V**
Item 7	To review and finalize the **Experiment list/ Lab manual and project list under Macro Project-II** for all the Laboratory Courses to be offered in **UG programmes – B.Tech. and B.Arch. IV Semester** (**for batch admitted in 2024-25**) along with their COs and CO-PO/PSO matrix. *The Experiment list/ Lab manual and project list under Macro Project-II for all the*

	Laboratory Courses to be offered in UG programmes – B.Tech. IV Semester-Electronics Engineering (for batch admitted in 2024-25) along with their COs and CO-PO/PSO matrix has been discussed and finalized. **Annexure-VI**
Item 8	To review and finalize the list of additional courses for **Honours/Minors** to be offered from SWAYAM/NPTEL/Institute MOOC based platform for **UG programmes – B.Tech. and B.Arch., IV Semester** (**for batch admitted in 2024-25**). *The list of additional courses for Honours/Minors to be offered from SWAYAM/NPTEL/Institute MOOC based platform for UG programmes – B.Tech. and B.Arch., IV Semester (for batch admitted in 2024-25).* **Annexure-VII**
Item 9	To propose/update the list of **professional certification platforms** and **relating certifications** with specific domain/areas of certification. {representative list to be prepared} *The propose list of professional certification platforms and relating certifications with specific domain/areas of certification for B.Tech in Electronics Engineering finalized as per the discussion with BoS members.* **Annexure-VIII**
Item 10	To review and finalize the scheme structure &syllabi of PG Programmes, II semester (admitted in 2025-26 session) along with their COs. **NA**
Item 11	To review and finalize the syllabus/module content for **Classified Novel Engaging Courses** to be offered in PG programmes, II semester (2025-26 admitted batch). **NA**
Item 12	To review and finalize the courses and syllabi for all courses of PG Programmes including the System Development Projects(MCA/MBA), IV semester (2024-25 admitted batch) along with their Course Outcomes (COs). **NA**
Item 13	To review the CO attainments, identify gaps and suggest corrective measures for the improvement in CO attainment levels for the courses taught in **second** semester, **January-June** 2025 Session. *The review of the CO attainments, gaps and corrective measures for the improvement in the CO attainment for the B.Tech-Electronics Engineering II-Semester courses taught in July-June 2025 has been finalized as per the discussion with BoS members.* **Annexure-XII**
Item 14	To consider and review the curriculum feedback from various stakeholders, its analysis and impact report.{Curriculum offered under MITS –DU structure (i.e. 2024-25 admitted batch) to be considered} *Curricula feedback for B.Tech-Electronics Engineering from various stockholders includes Students, Faculty, Employer and Alumni has been discussed and action taken report has been finalized***.** **Annexure-XIII**
Item 15	BoS Agenda under RGPV Structure as per the Annexure-1.**Annexure-XIV**
Item 16	Any other Matter

Annexure-I

Item 2	To review and finalize the scheme structure of **B.Tech./ B.Arch. II semester** for the **Batch admitted in 2025-26** academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) structure. *The scheme structure of B.Tech. II semester for the Batch admitted in 2025-26 under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) has been discussed and finalized.*

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Scheme of Evaluation

B. Tech. II Semester (EL) ***(for batch admitted in academic session 2025-26)***

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation		L	T	P				
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work &Sessional									
1.	14251201	DC	Electronics Engineering Material	25	25	20	30	-	-	100	3	-	-	3	Face to Face	MCQ	2 Hrs
2.	14251202	DC	Electronic Circuits	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	14251203	DC	Signals and Systems	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	14251204	DC	Digital Circuits and Systems	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	14251205	BSC	Linear Algebra and Differential Equation	25	25	20	30	-	-	100	3	-	-	3	Face to Face	MCQ	2 Hrs
6.	14251206	DLC	Digital Logic Design Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	14251207	DLC	Problem Solving through Python Programming	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	14251208	SP	Semester Proficiency$	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	14251209	PBL	Micro Project-II#	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-

Recommended in the Board of Studies Meeting of Department of Electronics Engineering held on 3rd Dec 2025

10	14251210	ESC	Foundation Engineering Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
11	14251211	HSMC	Language Lab	-	-	-	-	70	30	100	-	-	2	1	Blended	AO	-
12	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	_	50	-	1	-	1	Interactive	SO	-
13	SIP1XXXX	SIP	Skill Internship Program (Soft Skill)	-	-	-	-	60	_	60	-	-	4	2**	Experiential	SO	-
Total				**125**	**125**	**100**	**150**	**510**	**150**	**1160**	**12**	**04**	**16**	**24**	-	-	-
14	14251212	MAC	**Sustainability & Environmental Science**	-	-	-	-	100	-	100	2	-	-	GRADE	Blended	SO	-
15	14251213	MWS	**Mandatory Workshop on Career Planning & Goal Setting at Department Level**											GRADE	Interactive	MCQ	-
Summer Semester of six-eight week duration will be conducted for makeup of I& II semester examination.																	

[$]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses ,

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

[#] Micro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

.[**] These credits will be transferred from **Skill Internship Program (Soft Skill)**.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
1	1	1	4	0	0	0	2	1	1	1	0	0	1	1	1

Mode of Learning										Mode of Examination			
Theory		NEC	Lab				Theory			NEC	Lab		Total Credits
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
15	0	1	1	1	3	3	6	9	0	1	3	3	46
62.5%	0%	4.16%	4.16%	4.16%	12.5%	12.5%	25%	37.5 %	0%	4.16%	12.5%	12.5%	Credits %

Recommended in the Board of Studies Meeting of Department of Electronics Engineering held on 3rd Dec 2025

Annexure-II

Item 3	To review and finalize the syllabi of all courses of UG programmes - **B. Tech. and B.Arch. II Semester** (**for batch admitted in 2025-26**)along with their COs and CO-PO/PSO matrix. *The syllabi for all courses of B. Tech II Semester (for batch admitted in 2025-26) under the flexible curriculum along with their COs has been discussed and finalized.*

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251201	DC	Electronics Engineering Materials	25	25	20	30	-	-	100	2	1	-	3

Electronics Engineering Materials (14251201)

Course Objectives: To introduce the student with different materials and their characteristics used in manufacturing various electrical and electronics equipment.

UNIT 1: Introduction to Engineering Materials: Classification of materials: metals, polymers, ceramics, composites, semiconductors, Crystal structure: lattice types (SC, BCC, FCC), Miller indices, crystal imperfections, Mechanical properties: stress–strain, hardness, toughness, ductility, fatigue.

UNIT 2: Electrical & Dielectric Materials: Conductors, resistors, insulators: properties and uses, Dielectric materials: polarization, dielectric constant, dielectric loss, Ferroelectric and piezoelectric materials, Applications: capacitors, insulators, sensors, actuators, energy storage devices.

UNIT 3: Semiconductor Materials & Processing: Classification: intrinsic & extrinsic semiconductors, Band structure, energy gap, carrier concentration, Doping: n-type and p-type, mobility, diffusion, Semiconductor materials: Si, Ge, GaAs, SiC, GaN, Semiconductor fabrication basics: oxidation, diffusion, deposition, photolithography.

UNIT 4: Semiconductor Devices & Applications: PN junction, diode characteristics & applications**,** Zener diode, rectifiers, voltage regulators**,** BJT & FET materials and behaviour**,** LED, LASER diode: materials, working and applications**,** Photoconductors, photodiodes, solar cells**,** Sensors and transducers based on semiconductor materials.

UNIT 5: Advanced Materials (Dynamic-Jan-June 2026): Smart materials, shape memory alloys, piezoelectric materials, Nano-materials: CNT, graphene, nanocomposites, Bio-materials and eco-friendly materials.

Textbooks

1. Materials Science and Engineering – William D. Callister
2. Electronic Materials and Devices – S.O. Kasap
3. Engineering Materials – V. Raghavan

References

1. Semiconductor Devices – S. M. Sze
2. Electronic Materials – Sedha
3. Materials Science – Van Vlack

COURSE OUTCOMES

CO1: Discuss the basic classification, structure and mechanical properties of engineering materials.
CO2: Describe electrical, dielectric, magnetic and optical material properties important in engineering applications.
CO3: Understand semiconductor materials, band theory, doping and material-dependent device behavior.
CO4: Analyze applications of semiconductor devices such as diodes, transistors, LEDs, sensors and photovoltaics.
CO5: Compare and evaluate advanced materials including composites, smart materials and nanomaterials for modern engineering needs.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	1	1	1	1	-	1	1	1	3	2	1
CO2	3	3	3	2	1	1	-	-	2	1	1	3	2	2
CO3	3	3	3	2	2	1	-	-	2	1	1	3	2	2
CO4	3	3	2	1	2	1	1	-	2	1	1	3	2	2
CO5	3	3	2	1	1	1	1	-	1	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251202	DC	Electronic Circuits	25	25	20	30	-	-	100	2	1	-	3

Electronic Circuits (14251202)

Course Objective: To understand different semiconductor circuits and grab the way to design circuits and perform measurements of circuit parameters.

Unit I: BJT as an Amplifier: BJT as an amplifier and switch, Small signal models and analysis (CB, CE, CC), Frequency response of CE amplifier, Calculation of cut off frequencies.

Unit II: MOSFET as an Amplifier: Small signal models and analysis (Common Gate, Common Source, Common Drain). Frequency response of CS amplifier, Calculation of cut off frequencies.

Unit III: Feedback Circuits and Oscillators: General feedback structure, Properties of negative feedback, Four basic feedback topologies and their analysis. Principleof sinusoidal oscillators, Types of oscillators: RC phase shift, Wein bridge, Hartley, Colpitts, Clapp and crystal oscillator.

Unit IV: Power Amplifiers: Introduction to power amplifier, Classification of power amplifier, Operation and efficiency of: Series fed class A, Transformer coupled class A, Class B push pull, Crossover distortion, Class AB push pull, Class C power amplifier.

Unit V: Multistage amplifier(Dynamic-Jan-June 2026): Cascade amplifier, Cascade configuration, Darlington pair and Bootstrapping technique.

Text Books:

1. Microelectronic Circuits: Theory and Application: Sedra& Smith,7th Edition, Oxford University Press.
2. Electronics Devices and Circuits: Boylested&Nashelsky,11th Edition, Pearson Education India

Reference Books:

1. Electrical Engineering material: A.J Dekker, 1st Edition, Prentice Hall of India.
2. Micro Electronics: Millman, & Grabel,2nd Edition, McGraw Hill Education
3. Integrated Electronics: Millman&Halkias, McGraw Hill Education.

Course Outcomes

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

CO1: Evaluate the small-signal behaviour and frequency response of BJT amplifiers including the determination of cut-off frequencies.
CO2: Analyze small-signal response of MOSFET and C-V characteristics MOS capacitor.
CO3: Examine different feedback topologies and oscillator circuits.
CO4: Evaluate the performance, efficiency, and distortion characteristics of power amplifiers
CO5: Analyze multistage amplifier configurations such as cascade, Darlington pair, bootstrapped, and cascade circuits.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	2	1	2	3	2	_	1	2	2
CO2	3	3	3	1	2	2	1	2	3	2	-	2	3	3
CO3	3	3	2	2	2	2	1	2	3	1	1	2	3	2
CO4	3	3	2	2	2	2	1	1	3	2	1	2	3	3
CO5	3	3	3	2	2	2	1	2	3	2	1	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor EvaluationII	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251203	DC	Signals and Systems	25	25	20	30	-	-	100	2	1	-	3

Signals and Systems (14251203)

Course objective: Coverage of continuous and discrete-time signals and systems, their properties and representations and methods that is necessary for the analysis of continuous and discrete-time signals and systems.

Unit-1 Introduction: Mathematical description of continuous and discrete-time signals, Signal definition and classification; complex exponential and sinusoidal signals, Standard signals: unit step, signum, ramp, impulse, impulse train, rectangular, triangular, sinc, and Gaussian pulses, Even/odd signals; periodic and non-periodic signals; signal energy and power, Basic signal operations: amplitude scaling, time shifting, differentiation, and integration, System modeling and system properties: homogeneity, additivity, linearity, time invariance, causality, stability, memory, and nonlinearity, Continuous and discrete-time LTI systems.

Unit 2 Fourier Series and Fourier Transform: Fourier Transform: Exponential Fourier series, and Trigonometric Fourier series, properties of Fourier series, Introduction to Fourier transform, Fourier Transforms of elementary functions. Properties of Fourier Transform.

Unit 3: Z Transforms: Introduction to Z-transform, relation between Laplace and Z-transform, relation between Fourier transform and Z-transform, ROC, properties of ROC, Properties of Z-transform, Inverse Z-transform, Unilateral Z-transform.

Unit-4 Continuous and Discrete system analysis: The Convolution Integral, and Convolution Sum, Impulse Response, Convolution and Properties, System Interconnections, Stability and Impulse Response, Response of Systems to Standard Systems, Realization of Differential Equations, Analysis of discrete time LTI system using Z-transform, Analysis of continuous time LTI system using Laplace transform.

Unit-5 Signals for Intelligent and Cyber-Physical Systems(Dynamic-Jan-June 2026): Speech and audio basic, Signals in cyber-physical systems, Image signal fundamentals, Signals in autonomous vehicles, Signal visualization using Python, Real-time signal processing.

Text Books:

1. Alan V. Oppenheim, Alan S. Willsky and S. Hamid Nawab, Signals and Systems, 2nd Edition, Pearson Education India.
2. Simon Haykin and Barry Van Veen,Digital Signals and Systems, 2nd Edition, Wiley India Pvt. Ltd.
3. B. P. Lathi, Signal Processing and Linear Systems, 1st Edition, Berkeley–Cambridge Press, 1998.

Reference Books:

1. Hwei P. Hsu, Signals and Systems (Schaum's Outlines), 2nd Edition, Tata McGraw Hill Education.
2. Douglas K. Lindner, Introduction to Signals and Systems, International Edition, McGraw Hill, 1999.
3. J. Nagrath, S. N. Sharan, R. Ranjan and S. Kumar, Signals and Systems, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. R. F. Ziemer, W. H. Tranter and D. R. Fannin, Signals and Systems: Continuous and Discrete, 4th Edition, Prentice Hall, 1998.

Course Outcomes

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

CO1. Describe continuous and discrete time signals mathematically.

CO2. Determine the spectral characteristics of signals using Fourier series and Fourier transform.

CO3. **Apply** z-transform for analysis of discrete time signals.

CO4. **Evaluate** the performance parameters of LTI systems.

CO5. **Explain** basic speech, audio, and image signals and their real-time processing in cyber-physical systems

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	1	2	2	2	3	1	3	2	1
CO2	3	3	3	3	3	2	2	2	3	3	2	3	3	3
CO3	3	3	3	3	3	3	2	1	3	3	3	3	3	3
CO4	3	3	3	3	2	3	2	1	3	3	3	3	3	3
CO5	3	3	2	1	2	3	2	1	2	3	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251204	DC	Digital Circuits and Systems	25	25	20	30	-	-	100	2	1	-	3

Digital Circuits and Systems (14251204)

Course Objective: To understand the concept of digital systems, design & analyze the combinational and sequential logic circuits.

Unit I: Boolean algebra and Logic Minimization: Minimization of Boolean functions, Canonical & standard form, Minimization techniques: Karnaugh's map method and Quine-McCluskey's method, Universal gates, NAND/NOR implementation of Boolean functions.

Unit II: Combinational Logic Circuits: Half & Full Adders and Subtractors, Serial and parallel adder, Carry look-ahead adders; Multiplexers; De-multiplexers; Encoders; Priority Encoder; Decoders; Code Converters; Parity generators and Checkers

Unit III: Sequential Circuits: Latches, Flip Flops- SR, JK, D & T Flip Flop and Race around condition, Master-Slave and edge triggered; Shift Registers; Counters: Synchronous and Asynchronous, design of ripple counter. Johnson counter, ring counter, sequence generator, Finite state Machine (Moore and Mealy).

Unit IV: Logic Families and PLDs: RTL, DTL, TTL, ECL, HTL and CMOS logic etc. Comparison of various logic families, Programmable Logic Devices (PLDs): Programmable Logic Array (PLA), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs) .

Unit V: Emerging digital trends and its necessity(Dynamic-Jan-June 2026): Advanced Logic: Optimization and Synthesis**,** Low-power and High speed CMOS design principles, Modern Memory and Storage Concepts.

Text Books:

1. Digital Design: M. Mano,4th Edition, Prentice Hall of India.
2. Logic & Computer Design Fundamental: M.Mano, 5th Edition, Pearson Education India.
3. Digital Circuits and Design: S. Salivahanan,5th Edition, Oxford University Press.

Reference Books:

1. Digital Electronics: W.H. Gothman, Prentice Hall of India.
2. Digital System Principles & Applications: R.J. Tocci,11th Edition, Pearson Education India.
3. Pulse, Digital & Switching Waveforms: Millman&Taub, McGraw Hill Education.

Course Outcomes

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

CO1. Apply Boolean algebra to formulate and implement logic functions using basic and universal gates.
CO2. Design and analyze combinational circuits, including adders, subtractors, multiplexers, decoders, and code converters.
CO3. Design and evaluate sequential circuits such as flip-flops, counters, and shift registers.
CO4. Analyze logic families and explain Programmable Logic Devices and its classifications.
CO5. Apply emerging digital design concepts such as low-power CMOS techniques, high-speed logic, and programmable logic devices (FPGA/CPLD) in modern embedded and computing systems.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	1	2	1	2	1	2	2	3	3	3
CO2	3	3	3	3	2	3	1	2	2	1	3	3	2	2
CO3	3	3	3	3	2	2	1	-	1	2	1	2	3	3
CO4	3	3	2	2	2	2	2	-	2	1	1	2	3	3
CO5	3	3	3	2	3	3	1	1	1	1	2	3	2	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251205	BSC	Linear Algebra & Differential Equations	25	25	20	30	-	-	100	2	1	-	3

Linear Algebra & Differential Equations (14251205)

Objective of Course

- To understand the concept Matrices and its applications
- To comprehend the various aspect of algebraic structures
- To learn various methods to solve first-order differential equations effectively
- To understand techniques for solving higher-order linear differential equations.
- To study the formulation and solution methods for partial differential equations.

Unit1: Linear Algebra-I

Matrix, Rank of Matrix, Echelon form, Normal form of matrix, Solution of simultaneous equation by elementary transformation, Consistency of equation, Eigen values and Eigenvectors, Normalized eigenvector, Cayley Hamilton theorem and its application to finding inverse of matrix.

Unit2: Linear Algebra-II

Introduction to Groups and its properties, Vector spaces, linear dependent vectors and linear independent vectors, linear combination of vectors, linear span of a set of vectors, basis and dimension of a vector space.

Unit3: First Order Ordinary Differential Equations

Ordinary differential equations of first order and first Degree: Separation of variables, Transformation of some equations in which variables are separable, Homogeneous Equations, Equations reducible to Homogenous form, Exact Differential Equations, Linear Differential Equation, Bernoulli's Equation.

Unit-4 Second and Higher Order Differential Equations

Linear higher order differential equation with constant coefficients, Determination of complementary Function (C.F.), Determination of Particular Integral (P.I.), Homogeneous linear differential equation: Cauchy Euler Equations, Legendre's Linear Equation .

Unit-5: Partial Differential Equations(Dynamic-Jan-June 2026):

Order and Degree of Partial Differential Equations, Classification of First order PDE, Origin of Partial Differential Equations, Linear Partial Differential Equations of order one: Lagrange's Method, Non-Linear Partial differential equations of order one: Four standard forms, Homogeneous Linear PDE with constant coefficient.

Course Outcome

After completing this course, student will be able to:

CO1: Solve matrix problems and apply eigenvalue/eigenvector concepts.

CO2: Analyze vector spaces and determine basis and dimension.

CO3: various types of first-order differential equations using appropriate methods.

CO4: Solve higher-order linear differential equations and apply them to real-life problems.

CO5: Formulate and solve partial differential equations using standard techniques.

Recommended Books:

1. E. Kreyszig. *Advance Engineering Mathematics*, John Wiley & Sons, 10th Edition (2011).
2. S. Lipschutz and M. Lipson, *Linear Algebra* (4th Edition), Schaum's Outline series, Mc- Graw Hill. (2009).
3. B. S. Grewal. *Higher Engineering Mathematics*, Khanna Publishers, 43rd Edition (2015)..
4. B.V. Ramanna. *Higher Engineering Mathematics*, McGraw Hill Education, 1st Edition (2017).
5. G. F. Simmons. *Differential Equations with Applications and Historical Notes* (2nd ed.). McGraw-Hill. (1991).
6. P. J. Olver .*Introduction to Partial Differential Equations*. Springer. (1993).

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	1	1	2	1	2	1	2	2	2	2	3
CO2	1	3	3	3	2	3	1	2	2	1	3	3	2	2
CO3	3	3	3	3	2	2	1	-	1	2	1	2	3	3
CO4	3	3	2	2	2	2	2	-	2	1	1	2	3	3
CO5	3	3	3	2	3	3	1	1	1	1	2	3	2	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Annexure-III

Item 4	To review and finalize the **Experiment list/ Lab manual and project list under Micro Project-II** for all the Laboratory Courses to be offered in **UG programmes – B.Tech.and B.Arch. II Semester** (**for batch admitted in 2025-26**) along with their COs and CO-PO/PSO matrix. *The Experiment list/ Lab manual for all the Laboratory Courses and Micro Project-II to be offered in B.Tech. II semester has been discussed and finalized.*

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251206	DLC	Digital Logic Design Lab					70	30	100	-	-	2	1

Digital Logic Design Lab (14251206)

Course Objective: Develop skills in designing and verification of logic gates, combinational digital circuits and sequential digital circuits.

List of Experiment

1. Identification and verification of the truth tables for logic gates – AND, OR, NOT.
2. Identification and verification of the truth tables for logic gates EX-OR, EX- NOR, NAND, NOR
3. Design and verification of half adder and full adder
4. Design and verification of half subtractor and full subtractor
5. Design and verification of R-S Flip-Flop
6. Design and verification of J-K Flip-Flop
7. Design and verification of parity generator/checker
8. Design and verification of ripple counter using J-K Flip-Flop.
9. Design and verification of 2 and 4-bit left/right shift registers.
10. Design and verification of SISO, SIPO, PISO and PIPO shift registers.

Course Outcomes:
After completing the lab, students will be able to
CO1. **Verify** the truth table of basic and universal gates.
CO2. **Design** adder &subtractor circuits.
CO3. **Verify** the truth table of flip-flops.
CO4. **Design** various types of Counters.
CO5. Design different types of shift registers.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	1	1	1	1	1	2	2	3	2
CO2	3	3	3	3	3	1	1	1	1	1	2	2	3	3
CO3	3	2	3	3	3	1	1	1	1	1	2	2	3	3
CO4	3	3	2	3	3	1	1	1	1	1	2	2	3	3
CO5	3	2	2	3	3	1	1	1	1	1	2	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject	Category	Subject Name	Theory Slot	Practical Slot	Total	Contact	

Code	Code								Marks	Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251207	DLC	Problem Solving through Python Programming					70	30	100	-	-	2	1

Problem Solving through Python Programming (14251207)

Course Objectives: Develop skills in modular programming and dividing the code into logical modules using Python.

List of Experiments

1. Write python programming to declare various data type and display its data type.
2. Write a Python program to read a list of numbers and sort them in ascending and descending order.
3. Write python programming to perform addition and subtraction and display the result.
4. Write python programming to perform multiplication and division and display the result.
5. Write a Python program to create a list, perform list operations (append, insert, pop, remove), and display the updated list.
6. Write a python programming to perform logical operations and display the result.
7. Write a Python program to read marks of students, store them in a list, and compute the average, highest, and lowest marks.
8. Write python programming to declare array and display its different index position.
9. Write python programming to declare a string then (a) Capitalize it, (b) convert into title format, (c) Swap the case of string.
10. Write a python programming to declare a string use slice object to slice the given sequence to perform addition, subtraction, multiplication and division of integer and floating values.

Course Outcomes

After completing the lab, students will be able to:

CO1. **Write** basic programs in Python.

CO2. **Perform** arithmetic calculations, evaluate logical expressions, and manipulate strings using built-in Python operations and functions**.**

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Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	1	1	1	1	1	2	2	3	2
CO2	3	3	3	3	3	1	1	1	1	1	2	2	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject	Category	Subject Name	Theory Slot	Practical Slot	Total	Contact	

Code	Code								Marks	Hr./week			Total Credits
			Minor Evaluation	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251209	PBL	Micro Project-II					70	30	100	-	-	2	1

Micro Project-II (14251209)

Course Objectives: To design an application-based project

1. LED Blinking Circuit – Blink an LED using a 555 timer or microcontroller.
2. Light-Activated Switch – Use an LDR to turn devices on/off based on light intensity.
3. Water Level Indicator – Monitor and display water levels using LEDs and float sensors.
4. Automatic Night Lamp – Automatically turn on a lamp in low light using an LDR.
5. Battery Level Indicator – Indicate battery levels using LEDs and voltage dividers.
6. Clap-Activated Switch – Control devices with a clap using a sound sensor.
7. Temperature-Controlled Fan – Adjust fan speed based on temperature using a thermistor.
8. Rain Detector – Detect rainfall using a rain sensor and trigger an alert.
9. Traffic Light Controller – Simulate traffic signals using LEDs and timers.
10. Digital Thermometer – Measure temperature using a thermistor and display it on an LCD
11. Burglar Alarm System – Trigger an alarm when motion is detected using a PIR sensor.
12. IR Obstacle Detection System – Detect obstacles using IR sensors and LEDs.
13. Soil Moisture Sensor Circuit – Monitor soil moisture to automate irrigation systems.
14. Electronic Dice – Create an electronic dice using LEDs and a random generator circuit.
15. Heartbeat Monitor – Measure and display heart rate using a pulse sensor.
16. DC Motor Speed Controller – Control motor speed using a potentiometer and PWM.
17. Power Supply Regulator Circuit – Design a stable voltage supply using regulators.
18. Solar Mobile Charger – Use solar panels to charge mobile devices.
19. Line Follower Robot – Build a robot that follows a black line using IR sensors.
20. Metal Detector – Detect metallic objects using an inductive sensor circuit.
21. To-Do List Application – Create a task management system for adding, viewing, and deleting tasks.
22. Temperature Converter – Convert temperatures between Celsius, Fahrenheit, and Kelvin.
23. Quiz Application – Develop a multiple-choice quiz with scoring and result display.
24. Random Password Generator – Generate secure random passwords using Python's random module.
25. Dice Rolling Simulator – Simulate the rolling of dice with random number generation.
26. Currency Converter – Convert between different currencies using an API.
27. Simple Chatbot – Build a rule-based chatbot for basic conversation using conditionals.
28. Age Calculator – Calculate age from the user's date of birth.
29. File Renaming Tool – Automate renaming multiple files in a directory.
30. Basic Alarm Clock – Set a timer to trigger an alarm using time and sound libraries.
31. Temperature and Humidity Monitor – Use a DHT11 sensor to display real-time temperature and humidity.
32. Obstacle Avoiding Robot – Employ an ultrasonic sensor to detect and avoid obstacles.
33. Soil Moisture Detection System – Monitor soil moisture levels and trigger a water pump when dry.
34. Motion-Activated Security Alarm – Use a PIR sensor to detect motion and trigger an alarm.
35. Fire Detection System – Detect fire using a flame sensor and sound an alert.
36. Smart Dustbin – Open a dustbin lid automatically using an ultrasonic sensor.
37. Gas Leakage Detection System – Use an MQ-2 sensor to detect gas leaks and trigger a buzzer.

38. Heartbeat Monitoring System – Measure heart rate using a pulse sensor and display the results.
39. Simple Calculator – Perform basic arithmetic operations to understand input/output and operators.
40. Number Guessing Game – Implement a random number guessing game using loops and conditionals.
41. Student Grade Calculator – Calculate grades based on input marks using decision-making statements.
42. Library Management System – Manage book records using file handling and structures.
43. Tic-Tac-Toe Game – Build a two-player game to practice arrays and game logic.
44. Bank Account Management System – Simulate banking operations using classes and OOP concepts.
45. Prime Number Finder – Identify prime numbers in a range using loops and mathematical logic.
46. Contact Management System – Store and manage contacts using structures and file handling.
47. Simple Voting System – Create a voting system with counters and conditional statements.
48. Rock, Paper, Scissors Game – Develop a game using random number generation and control flow.
49. Touch-Activated LED Light Using Transistor and Touch Plates.
50. Three-Level Battery Indicator Using Discrete Transistor Thresholds.
51. LDR-Controlled Automatic Night Lamp Using Transistor Switching
52. Thermistor-Based Temperature Alarm Using Transistor Triggering
53. Water Level Buzzer Using Conductivity Probes and Transistor Driver.
54. Two-Stage Transistor Mini Audio Amplifier for Small-Signal Gain.
55. Siren Generator Using Dual-Transistor Multivibrator Circuit.
56. Analog DC Motor Speed Controller Using Potentiometer and Power Transistor.
57. Reverse Polarity Protection Circuit Using Diode and LED Indicator.
58. Full-Wave Bridge Rectifier Using Four Discrete Diodes.
59. LED Light Chaser Using Dual-Transistor Multivibrator Sequencing.
60. Soil Moisture Detection Circuit Using Probes and Transistor Trigger.
61. Touch-Activated LED Switch Using Skin Resistance Trigger.
62. Delay-ON Timer Circuit Using RC Network and Transistor.
63. Transistor-Based Relay Driver for DC Load Switching.

Course Outcomes:

Students will be able to:

CO1: **Analyze** the electronic components, measuring instruments, and tools.
CO2: **Design** and simulate the schematic, layout using CAD software.
CO3: **Design** and fabricate PCBs for various electronic circuits individually and in a team.
CO4: **Troubleshoot** the program or circuit individually and in a team.
CO5: **Implement** mini project that benefits society.

Annexure-IV

Item 5	To review and finalize the scheme structure of **B.Tech./B.Arch. IV semester** for the **Batch admitted in 2024-25** academic session under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) structure. *The scheme structure of B.Tech. IV semester for the Batch admitted in 2024-25 under the Madhav Institute of Technology & Science-Deemed University (MITS-DU) has been discussed and finalized.*

माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
Deemed University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ GRADE

Scheme of Evaluation

B. Tech. IV Semester (EL) *(for batch admitted in academic session 2024-25)*

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation.	Duration of Major Evaluation.
				Theory Block				Practical Block									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation		L	T	P				
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment		Lab Work & Sessional									
1	14242201	**DC**	Digital Signal Processing	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2	14242202	**DC**	Microprocessor and Interfacing	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3	14242203	**DC**	Wireless Communication	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4	14242204	**DC**	Electromagnetic Theory	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5	14242205	**DC**	System Design using Verilog	25	25	20	30	-	-	100	3	-	-	3	Face to Face	MCQ	2 Hrs
6	14242206	**DLC**	Microprocessor and Interfacing Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7	14242207	**DLC**	Wireless Communication Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8	14242208	**DLC**	System Design Lab using Verilog	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
9	14242209	**SP**	Semester Proficiency$^{\$}$	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
10	14242210	**PBL**	Macro Project-II$^{\#}$	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
11	NECXXXXX	**NEC**	Novel Engaging Course (Activity Based Learning)	-	-	-	-	50	-	50	-	1	-	1	Interactive	SO	-
12	SIP3XXXX	**SIP**	Skill Internship Program	-	-	-	-	60	-	60	-	-	4	2**	Experien	SO	

Recommended in the Board of Studies Meeting of Department of Electronics Engineering held on 3rd Dec 2025

															tial		
Total				125	125	100	150	490	188	1110	11	05	14	23	-	-	-
13	14242211	**MAC**	Project Management, Economics & Financing	-	-	-	-	100	-	100	2	-	-	GRADE	Blended	SO	-
14	14242212	**MWS**	Mandatory Workshop on Intellectual Property Rights at Department Level											GRADE	Interactive	MCQ	-
Summer Semester of six-eight week duration will be conducted for makeup of previous semester examination.																	
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree																	

[$] Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

[#] Macro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

[**] These credits will be transferred from Skill Internship Program.

PC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
1	0	0	5	0	0	0	3	1	1	1	0	0	1	1	2

Mode of Learning							Mode of Examination						Total Credits
Theory		NEC	Lab				Theory			NEC	Lab		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	MCQ	OB	SO	AO	SO	
15	0	1	1	0	3	3	6	9	0	1	3	5	42
62.5%	0%	4.16%	4.16%	0%	4.16%	9.5%	25%	37.5 %	0%	4.16%	12.5%	20.83%	Credits %

Recommended in the Board of Studies Meeting of Department of Electronics Engineering held on 3rd Dec 2025

Annexure-V

Item 6	To review and finalize the syllabi of all courses of UG programmes - **B. Tech. and B.Arch. IV Semester** (**for batch admitted in 2024-25**)along with their COs and CO-PO/PSO matrix. *The syllabi for all courses of B. Tech IV Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs has been discussed and finalized.*

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242201	DC	Digital Signal Processing	25	25	20	30	-	-	100	2	1	-	3

Digital Signal Processing (14242201)

Course Objectives: Understanding of the fundamental concepts of digital signal processing, designing of digital filters, and brief knowledge about the DSP for next generation communication.

Unit I: Review of Transform Domain Techniques: Review of discrete time signals and systems, Properties and applications of discrete time Fourier transform, Review of Z transform, Analysis of minimum phase, maximum phase and inverse system.

Unit II: Discrete Fourier Transform (DFT): Introduction and properties of DFT, Computation of circular convolution using DFT, Decimation in time FFT algorithm, Decimation of frequency FFT algorithm with radix-2, and radix-4.

Unit III: Digital Filters (Part-I): Characteristics of practical frequency selective filters, Various signal flow graph structure of IIR filters. IIR Filter design: Overview of Butterworth, Chebyshev and Elliptic approximations, Design of discrete time IIR filters using Impulse invariant, and bilinear transformation methods, Spectral transformation of IIR filters.

Unit IV: Digital Filters Part-II: Introduction and Signal flow graph structure of FIR Filter. FIR Filter design: Symmetric, and Asymmetric FIR filters, Design of linear phase FIR filters using windows, and Frequency sampling method, Design of Optimum Equiripple linear phase FIR filters, Design of FIR differentiators.

Unit V: DSP for Next Generation Communication(Dynamic-Jan-June 2026): Qualcomm Hexagon DSP for 5G smart phones and modems, beamforming, channel estimation.

Text Books:

1. John. G. Proakis, “Digital Signal Processing”, 4th Edition, Pearson Education.
2. Oppenheim and Schafer, “Digital Signal Processing”, 2nd Edition, PHI Learning.

Reference Books:

1. Johnny R. Johnson, “Introduction to Digital Signal Processing”, 1st Edition, PHI Learning.
2. Rabiner and Gold, “Theory and Application of Digital Signal Processing”,3rd Edition, PHI Learning.
3. Ingle and Proakis, ”Digital Signal Processing- A MATLAB based Approach”, 3rd Edition, Thompson, Cengage Learning.

COURSE OUTCOME:-

Students will be able to:

CO1: Analyze the discrete-time signals, systems, DTFT and Z-transform concepts.
CO2: Apply DFT/FFT algorithms for efficient spectral analysis and convolution.
CO3: Design IIR filters using classical approximations and transformation methods.
CO4: Design FIR filters using window, frequency sampling, and equiripple techniques.
CO5: Apply DSP in beam forming and 5G communications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	1	1	1	-	1	1	1	3	2	1
CO2	2	3	3	2	1	1	1	-	2	1	1	3	2	2
CO3	3	2	3	2	2	1	-	-	2	1	1	3	2	2
CO4	3	3	2	1	2	1	1	-	2	1	1	3	2	2
CO5	3	3	2	1	1	1	1	-	1	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242202	DC	Microprocessor and Interfacing	25	25	20	30	-	-	100	2	1	-	3

Microprocessor and Interfacing (14242202)

Course objectives: To introduce the basic concepts of microprocessor and microcontroller and to develop assembly language programming skills along with their use in various applications.

Course Contents:

Unit I: Introduction to Microprocessor

Introduction to microprocessors and microcomputers, 8-bit/16-bit Microprocessor, Overview of Intel Pentium-I, Pentium i3, i5 and i7 Series Processor. Study of 8 bit Microprocessor, 8085 pin configuration, Internal Architecture and operations, Interrupts, Interrupts and interrupt service routine.

Unit II: 8085 Assembly language Programming and Timing diagram

8085 instruction set, Data transfer operations, Arithmetic operations, logic operations, Branch operations, 8085 assembly language programming, Debugging the program, Addressing modes of 8085. Counters and Time delays, Instruction cycle, Machine cycle, T-states, timing diagram for different 8085 arithmetic, logical and branch instructions.

Unit III: Peripheral ICs

Memory interfacing and various interfacings chips like: Programmable input/output ports 8155/8255(PPI), Programmable interval timer 8253/8254 (PIT), Programmable interrupt controller 8259 (PIC) and DMA controller 8257.

Unit IV: Architecture and Programming of 16-Bit Microprocessor

8086 Block diagram and Architecture, Pin configuration of 8086, Execution Unit (EU) and Bus Interface Unit(BIU), Minimum mode & Maximum mode operation, Memory segmentation, Instruction set and addressing modes of 8086, Introduction to 8086 assembly language programming.

Unit V: Advanced Microprocessor Architectures(Dynamic-Jan-June 2026):

Overview of ARM Architecture, ARM Processor Architecture, ARM Design, States, Registers, Modes, Conditional Execution, Pipelining, Vector Tables, Exception handling.

Text Books:

1. Ramesh. S. Gaonkar, "Microprocessor architecture Programming and Application with 8085" Penram International Publishing, 4th Edition.
2. B.Ram, "Fundamentals of microprocessors and microcomputer" Dhanpat Rai, 5th Edition.

Reference Books:

1. Douglas V Hall., "Microprocessor and Interfaing" Tata Mcgraw Hill
2. A.K. Ray and K. M. Bhurchandi , "Advance microprocessor and peripheral", Tata Mcgraw Hill

Course Outcomes

At the end of this course, students will be able to:
CO1: Analyze 8085 microprocessor architecture and operational principles.
CO2: Develop assembly language programs for problem-solving.
CO3: Integrate peripheral ICs into microprocessor-based systems.
CO4: Analyze x86 microprocessor architecture and operational principles.
CO5: Analyze the architecture and programming of advanced microprocessors.

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Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	1	1	1	1	-	1	1	1	3	2	1
CO2	3	3	3	2	1	1	-	-	2	1	1	3	2	2
CO3	3	3	3	2	2	1	-	-	2	1	1	3	2	2
CO4	3	3	2	1	2	1	1	-	2	1	1	3	2	2
CO5	3	3	2	1	1	1	1	-	1	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242203	DC	Wireless Communication	25	25	20	30	-	-	100	2	1	-	3

Wireless Communication (14242203)

Course Objective:

This course aims to build a strong foundation in random processes, noise modeling, and digital modulation techniques essential for wireless communication. It equips learners with the skills to analyze,and evaluate baseband and band-pass transmission schemes, assess system performance under noise, and fading channels.

Unit 1: Random Process and Spectral Density Functions: Probability and Random Variables, Gaussian Random Variables, Central Limit Theorem, Rayleigh distribution, Random Process: mean, correlation and covariance; non stationary, stationary, and ergodic processes; power spectral density; Gaussian Process, White Noise.

Unit 2: Digital Baseband Data Transmission for Wireless Communication: Baseband Transmission of Digital Data, Line Coding, Inter-symbol Interference Problem, Pulse Shaping: Nyquist Channel, Raised-Cosine Pulse Spectrum, Gaussian Pulse Shaping Filter, Baseband Transmission of M-Ary Data.

Unit 3: Digital Band-Pass Modulation Techniques for Wireless Communication: Basic digital modulations schemes, MSK, GMSK, and Digital QAM; coherent demodulation and detection; ***M***-ary Digital Modulation Schemes, PSD of Digital Carrier Modulation.

Unit 4: Performance Analysis of Digital Modulation : Bit Error Rate, Detection of a Single Pulse in Noise, Optimum Detection of Binary PAM, BPSK, BFSK, QPSK and QAM in Noise, Summary of Digital Performance.

Unit 5: Emerging Wireless Technologies (Dynamic-Jan-June 2026): 6G visions and System Design Considerations and Implications, orthogonal and non-orthogonal multiple access and massive MIMO.

Text Books:

1. A. Papoulis, and Unnikrishna Pillai, "Probability, Random Variables and Stochastic Processes", Fourth Edition, McGraw Hill, 2002.
2. Rappaport T.S., Wireless communications", Second Edition, Pearson Education, 2010.
3. B. P. Lathi&Zhi Ding: Modern Digital & Analog Communication Systems, 4th Edition, Oxford University Press
4. S. Haykin and Michael Moher: An Introduction to Analog & Digital Communications, 2nd Edition, Wiley India.

Reference Books:

1. Andreas. F. Molisch, Wireless Communications, John Wiley – India, 2006.
2. David Tse and PramodViswanath, Fundamentals of Wireless Communication, Cambridge University Press, 2005.
3. B. Sklar, "Digital Communication Fundamentals and Applications", 2nd Edition, Pearson Education, 2009.
4. Leon W. Couch, Digital and Analog Communication Systems, 6th Edition, Pearson Education, 2001

After completion of this course students will be able to:

CO1: Analyze random processes, noise models, and spectral density functions used in wireless communication.

CO2: Apply appropriate line coding, pulse-shaping, and ISI-mitigation methods to achieve efficient baseband transmission.

CO3: Apply digital band-pass modulation techniques and constellation mapping for wireless signal transmission.

CO4: Evaluate digital modulation performance through BER analysis and optimal detection methods in noisy environments.

CO5: Explore advanced wireless technologies including 6G, orthogonal and non orthogonal multiple access, MIMO, and cognitive radio.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	1	1	1	1	1	2	2	3	2
CO2	3	3	3	3	3	1	1	1	1	1	2	2	3	3
CO3	3	2	3	3	3	1	1	1	1	1	2	2	3	3
CO4	3	3	2	3	3	1	1	1	1	1	2	2	3	3
CO5	3	2	2	3	3	1	1	1	1	1	2	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242204	DC	Electromagnetic Theory	25	25	20	30	-	-	100	2	1	-	3

Electromagnetic Theory (14242204)

Course objectives: To develop an understanding of fundamental concepts of electromagnetic fields with an emphasis on wave propagation and to create ability to relate basic electromagnetic concepts to the performance of devices, circuits, and systems.

Unit I: Electrostatics: Coulomb's Law, Electric field intensity, Electric flux and flux density, Gauss law, Boundary relations, Electric potential, Divergence, Curl, Divergence and Stokes theorem, Electric field in dielectric and conductor, Continuity equation, Poisson's and Laplace's equations.

Unit II: Magnetostatics and Electrodynamics: Biot-Savart's Law, Magnetic Field intensity due to a finite and infinite wire carrying current; Magnetic field intensity on the axis of a circular loop carrying current; Magnetic flux Density; Magnetic Vector Potential; Magnetic force, force between current carrying wires, Ampere's circuital law; Boundary conditions for magnetic fields; Conduction current and displacement current densities; Faraday's Law, Maxwell's equations (differential and integral form) –for steady, time varying and time harmonic fields.

Unit III : Electromagnetic Wave Equation: General wave equation, Uniform plane wave in free space, Perfect dielectric, Lossy dielectric and conducting medium, Skin depth, Poynting vector and Poynting theorem. Wave Polarization- linear-elliptic-circular, Reflection of uniform plane waves, Normal incidence and Oblique incidence, Brewster angle, Total internal reflection.

Unit IV: **Transmission Line**: Transmission lines parameters, Equations of Voltage and Current on TX line, Propagation Constant and Characteristic Impedance, Input Impedance, and Reflection Coefficient and VSWR, Power Transfer, Lossless and Distortion less Transmission Lines, Smith Chart, Applications of Transmission Lines, Impedance Matching: Single and Double Stub Lines.

Unit V: Antenna for Next-Generation Systems (Dynamic, Jan-June 2026): Basics of Antenna, Microstrip Patch Antenna, Design of Embedded Chip Antennas.

Text Books:

1. Elements of Engineering Electromagnetic Third Edition- N.N. Rao- Prentice Hall, India.
2. Elements of Electromagnetics: Mathew N. O.Sadiku, 3rd Edition, Oxford Publication Press.
3. Electromagnetic - J.D. Kraus-McGraw Hill.

Reference Books:

1. Fields & Waves in Communication Electronics - S.Ramo, J.R. Whinnery& T. Van Duzer- John Wiley & Sons.
2. Electromagnetic Waves & Radiating Systems - E.C. Jordan & K.G. Balmain- Prentice
3. Networks, Lines, &Fields: J.D. Ryder, 2nd Edition, Prentice Hall of India.

Course Outcomes

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

CO1. Analyze the concepts of electrostatic fields in practical applications.
CO2. Apply Magnetic Field concepts and the maxwell equations to solve problems of time varying fields.
CO3. Analyze propagation, polarization and reflection of electromagnetic waves in a practical field. in different media.
CO4. Analyze the characteristics of transmission lines.

CO5. Design suitable antennas for next-generation systems such as IoT, 5G/6G, and smart devices.
CO6. Apply the concepts of Advanced Electromagnetics in various practical applications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	1	-	2	1	-	1	-	3	3	1
CO2	3	3	3	3	2	-	2	1	-	1	-	1	3	1
CO3	3	3	3	3	3	-	1	-	-	1	-	2	3	1
CO4	3	3	3	2	3	-	1	-	-	1	-	1	3	1
CO5	3	3	3	3	3	-	1	-	-	1	2	3	3	

1 - Slightly; 2 - Moderately; 3 Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242205	DC	System Design using Verilog	25	25	20	30	-	-	100	2	1	-	3

System Design using Verilog (14242205)

Course Objective: To develop students' ability to model, design, simulate, and verify digital systems using Verilog enabling them to apply modern HDL-based design and verification methodologies for efficient and reliable electronic system development.

Unit 1:Introduction to Verilog HDL: Verilog as HDL, Levels of Design Description, Concurrency, Program structure, Top-down and Bottom up design methodology, differences between modules and module instances, parts of a simulation, design block, stimulus block, Verilog Data types and Operators, system tasks, compiler directives. Modules and Ports: Modules, Ports, Hierarchical names. Gate-Level Modeling: Gate types, Gate delays.

Unit 2: Data flow Modelling: Continuous assignments, Delays, Expressions, Operators and Operands. Operator types, Examples. Behavioural Modelling: Structured procedures, Procedural assignments, Timing controls, Conditional statements, Multiway branching, Loops, Sequential and parallel Blocks, Generate blocks, Examples.

Unit 3: Task and Functions: Differences between tasks and functions, Tasks, Functions. Useful Modelling Techniques: Procedural continuous assignments, Overriding parameters, Conditional compilation and execution, Time scales, Useful system tasks. Timing and Delays: Types of delay models, Path delay modelling, Timing checks, Delay back annotation.

Unit 4: Test Benches: Basic test benches, Test bench structure, Constrained random stimulus generation, Object-oriented programming and Assertion-based verification.

Unit 5: System Verilog (Dynamic-Jan-June 2026): Adoption for Advanced Verification, UVM (Universal Verification Methodology), Verilog designs integrated with C/C++/System C-based HLS tools.

Text Books:

1. Verilog HDL: Samir Palnitkar, 2nd Edition, Pearson Education.
2. Digital System Design with System Verilog: Mark Zwolinski, 1st Edition, Pearson Education.

Reference Books,

1. Fundamentals of Digital Logic with Verilog Design: Stephen Brown and ZvonkoVranesic, 3rd Edition, McGraw-Hill.
2. Verilog HDL Synthesis-A practical Prime: J. Bhasker, 1st Edition, Star galaxy Press.

Course Outcomes

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

CO1: Explain the structure, syntax, and design methodologies of Verilog HDL along with gate-level and module-level modeling techniques.
CO2: Develop digital circuits using dataflow and behavioural modeling constructs including timing controls, conditional statements, loops, and generate blocks.
CO3: **Evaluate** digital system designs using tasks, functions, advanced modeling techniques, path delay modeling, timing checks, and delay back-annotation.
CO4: **Design** verification environments using structured test benches, and constrained-random stimulus.
CO5: **Construct** advanced verification frameworks using System Verilog features.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	2	2	1	2	3	1	_	1	2	2
CO2	3	3	2	2	2	2	1	2	3	2	_	2	3	3
CO3	3	3	2	3	2	2	1	2	3	1	1	2	3	2
CO4	3	2	3	3	2	2	1	1	3	2	1	2	3	3
CO5	3	2	3	3	2	2	1	2	3	2	1	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Annexure-VI

Item 7	To review and finalize the **Experiment list/ Lab manual and project list under Macro Project-II** for all the Laboratory Courses to be offered in **UG programmes – B.Tech. and B.Arch. IV Semester** (**for batch admitted in 2024-25**) along with their COs and CO-PO/PSO matrix. *The Experiment list/ Lab manual and project list under Macro Project-II for all the Laboratory Courses to be offered in UG programmes – B.Tech. IV Semester-Electronics Engineering (for batch admitted in 2024-25) along with their COs and CO-PO/PSO matrix has been discussed and finalized.*

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242206	DLC	Microprocessor and Interfacing Lab					70	30	100	-	-	2	1

Microprocessor and Interfacing Lab (14242206)

Course Objectives

This course gives the ability to the students to learn the assembly language programming of 8085 and 8086 microprocessor and their interfacing with different peripherals.

List of Experiments

1. Write an assembly language program to perform addition operation on two immediately given 8 bit numbers using 8085 microprocessor.
2. Write an assembly language program to perform addition operation on two numbers 8 bit numbers stored in memory using 8085 microprocessor.
3. Write an assembly language program to find whether the number is even or odd using 8085 microprocessor.
4. Write an assembly language program to obtain 2's complement of a given number using 8085 microprocessor.
5. Write an assembly language program to perform arithmetic operations of two BCD numbers using 8085 microprocessor.
6. Interface a Stepper Motor to the 8085 microprocessor system and write an 8085 assembly language program to control the Stepper Motor.
7. Write an assembly language program to generate standard waveforms using DAC and display waveforms on CRO with 8085 microprocessor.
8. Write an assembly language program to Multiply Two 16-Bit Numbers with 8086 microprocessor.
9. Write an assembly language program to find the square of a given number with 8086 microprocessor.
10. Write an assembly language program to Move a Block of Data from one memory location to another with 8086 microprocessor.

Course Outcomes:

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

1. **Execute** the assembly language programs for arithmetic and logical operations with 8085 and 8086 microprocessor.
2. **Design** an interfacing circuits using peripheral ICs with 8085 microprocessors.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	1	1	1	1	-	1	1	1	3	2	1
CO2	3	3	3	2	1	1	-	-	2	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242207	DLC	Wireless Communication Lab					70	30	100	-	-	2	1

Wireless Communication Lab (14242207)

Course Objective: This lab aims to develop hands-on skills in analyzing the error performance of digital modulation schemes and wireless communication systems. Students will simulate BER and SER characteristics for various modulation formats under AWGN, Rayleigh fading, ISI, OFDM, and MIMO channels, and gain practical experience in configuring 5G systems

List of Experiments

1. Determine the BER performance of BPSK in an AWGN channel.
2. Calculate the Symbol Error Rate (SER) for QPSK modulation.
3. Compute the Bit Error Rate (BER) for DPSK modulation.
4. Compute the Bit Error Rate for FSK modulation.
5. Evaluate the error rate for 16-QAM modulation with Gray mapping.
6. Calculate the Symbol Error Rate (SER) analysis for 16-QAM, 64-QAM, and 256-QAM modulation schemes in an OFDM system over an AWGN channel.
7. Configure and bring up the 5G Core, IMS, and gNodeB.
8. Compute the BER performance of BPSK using OFDM transmission.
9. Calculate the Bit Error Rate (BER) for BPSK modulation in a flat Rayleigh fading channel, both with and without beam forming.
10. Compute the BER for BPSK in a 2×2 MIMO Rayleigh fading channel.

Course Outcome:

CO1: Compute error rate for various modulation techniques across different channel models.

CO2: Demonstrate the setup of 5G Core and gNodeB.

CO3: Implement OFDM, MIMO, and beamforming for performance optimization.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	2	1	1	1	1	2	1	2	3	2
CO2	2	2	3	2	3	1	1	1	2	2	2	2	3	3
CO3	3	3	3	3	3	1	1	1	2	2	2	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242208	DLC	System Design Lab using Verilog					70	30	100	-	-	2	1

System Design Lab using Verilog (14242208)

Course Objectives: To enhance practical skills in hierarchical design, modular coding, and reusable hardware components using Verilog constructs

List of Experiments

1. Design and simulation of half adder, and full adder circuit using gate and data level modelling.
2. Design and simulation of half adder, and full adder circuit using behavioural level modelling.
3. Design and simulation of Flip-flops and Latches (JK, D, T, SR) using behavioural level modelling.
4. Design and simulation of 4-bit comparator using behavioural modelling and parameter statement.
5. Design and simulation of 8-bit adder circuit using structural modelling and generic statement.
6. Design and simulation of 4-bit Carry-Look ahead Adder.
7. Design and simulation of 4-bit Universal Shift Register.
8. Design and simulation of MOD-n UP/DOWN Counter.
9. FPGA Implementation of full adder circuit.
10. FPGA Implementation of Ring and Johnson Counter.

Course Outcomes:

After successful completion of the course, students will be able to:
CO1: **Design** combinational and sequential digital circuits using gate-level, dataflow, behavioral, and structural modeling in Verilog HDL.
CO2: **Implement** arithmetic and sequential circuits such as adders, comparators, shift registers, and counters using parameterized and modular Verilog constructs.
CO3: **Demonstrate** FPGA-based realization of digital circuits including adders and counters using industry-relevant hardware tools.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	2	1	1	1	1	2	1	2	3	2
CO2	2	2	3	2	3	1	1	1	2	2	2	2	3	3
CO3	3	3	3	3	3	1	1	1	2	2	2	3	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14242210	PBL	Macro Project-II					70	30	100	-	-	2	1

Macro Project-II (14242210)

Course Objective: To design and develop an application-oriented mini project demonstrating practical implementation of core concepts.

1. Smart Waste Segregation System.
2. Smart Drone Landing System Using Ultrasonic.
3. Indoor Localization Using Bluetooth Low Energy.
4. FSM-Based Digital Stopwatch with Start–Stop–Reset Functionality.
5. Design and Simulation of a 4-Stage Pipelined ALU.
6. Design and Verification of Dual-Port RAM (32×8) with Independent Access Ports.
7. Development of a Minimal RISC-Lite CPU Supporting Eight Instructions.
8. Vehicle Accident Detection Using Accelerometer and GSM Alerts.
9. Smart Trolley with Automatic Billing Using RFID.
10. Smart Street Garbage Bin Level Indicator.
11. Design of a 32-Bit Priority Encoder with Timing Optimization.
12. Smart Inventory Shelf Using Weight Sensors.
13. Smart Gas Leakage Detector with Automatic Valve Control.
14. Smart Dustbin with Auto-Lid and Fill-Level Alert.
15. IoT-Based Smart Street Lighting with Motion Sensing.
16. Intelligent Weather Station with Simple Prediction .
17. Real-Time Traffic Sign Detection on Raspberry Pi.
18. Traffic Signal Controller Using Moore FSM with Pedestrian Mode
19. Fall Detection Using IMU.
20. Smart Agriculture Node.
21. Design of a 32-Bit ALU with Status Flags.
22. Development of a Full-Duplex UART Transmitter–Receiver Module
23. Smart Attendance System With Face Recognition using ESP32-CAM and small dataset.
24. IoT Smart Wheelchair with Gesture Control .
25. Smart Door Lock with Multi-Security using RFID and OTP.
26. Implementation of a Configurable PWM Generator Using Verilog HDL.
27. Intelligent Traffic Light System using basic camera and simple vehicle count.
28. Smart Inventory Management with RFID and Cloud.
29. IoT Air Pollution Monitoring with Basic AQI Prediction .
30. Smart Water Distribution Automation with Flow Sensors.
31. Gesture Controlled Robot.
32. Real-Time Drowsiness Alert System using IR Eye Blink Detector.
33. IoT-Based Cold Chain Monitoring with Graph Analytics.
34. Home Energy Usage Analyzer with Simple Load Forecast using Small Dataset.
35. Solar Panel Monitoring Using ESP32 and Cloud Dashboard.
36. Smart Parking System using Ultrasonic Sensors.
37. IoT-Based Water Leakage Detection in Buildings.
38. IoT-Enabled Cold Storage Temperature Monitoring.
39. IoT-Based Smoke Detection System.
40. Intelligent Mini Weather Station using Temp/Humidity/Pressure.
41. Smart Water Meter with Real-Time Billing.
42. IoT-Based Aquaponics Monitoring & Auto-Control.
43. Smart Helmet with Accident Detection & Alerts.

44. IoT-Based Water Quality Monitor.
45. Smart Mini Energy Meter using basic consumption logging.
46. IoT-Based Air Pollution Monitor.
47. Wireless Door Lock with RFID Authentication.
48. Traffic Light System with Vehicle Counting using IR Sensors.
49. Smart Garden Irrigation System.
50. IoT Weather Logging System with Cloud Storage.
51. Low cost Smart Doorbell with ESP32 Camera .
52. LPG/Smoke Alarm System with Mobile Notification.
53. IoT-Based Room Occupancy Detection.
54. Smart Fan Speed Controller (Temp based).
55. ESP32-Based Clock with Internet Time Sync.
56. Smart Bicycle Anti-Theft Alarm.
57. Attendance System using RFID/NFC.
58. Smart Dustbin with Auto-Lid and Fill-Level Alert.
59. IoT Water Tank Level Controller using Ultrasonic.
60. RFID-Based Library Book Tracking.
61. Smart Panic Button for Elderly Safety.
62. Portable ECG Display System .
63. IoT Fire Alert System for Home Safety.
64. Contactless Digital Thermometer Using IR Sensor.
65. Simple Home Security System with Motion Alerts.

Course Outcomes:

Students will be able to:

CO1: **Analyze** the electronic components, measuring instruments, and tools.
CO2: **Design** and simulate the schematic, layout using CAD software.
CO3: **Design** and fabricate PCBs for various electronic circuits individually and in a team.
CO4: **Troubleshoot** the program or circuit individually and in a team.
CO5: **Implement** mini project that benefits society.

Annexure-VII

Item 8	To review and finalize the list of additional courses for **Honours/Minors** to be offered from SWAYAM/NPTEL/Institute MOOC based platform for **UG programmes – B.Tech. and B.Arch., IV Semester** (**for batch admitted in 2024-25**). *The list of additional courses for Honours/Minors to be offered from SWAYAM/NPTEL/Institute MOOC based platform for UG programmes – B.Tech. and B.Arch., IV Semester (for batch admitted in 2024-25) has been discussed and finalized.*

S.No	Category Code	Domain	Name of The course	Duration of the Course in weeks	Course		Name of the Mentor Faculty
					Start Date	End Date	
Electronics Engineering							
1	**Honors**	**Microelectronics and VLSI Design**	Semiconductor Device Modeling and Simulation	**12**	Jan 19, 2026	Apr 10, 2026	Dr. Hemant Choubey
2			Basic Overview of Semiconductor Device Processing and IC Fabrication	**12**	Jan 19, 2026	Apr 10, 2026	Dr.Kumar Gaurav
4		**Communication Systems and Networks**	Communication Networks	**12**	Jan 19, 2026	Apr 10, 2026	Dr.Madhav Singh
5			Network Security	**12**	Jan 19, 2026	Apr 10, 2026	Dr.Mukesh Kumar Mishra
6		**Signal Processing**	Signal Processing Techniques and Its Applications	**12**	Jan 19, 2026	Apr 10, 2026	Dr. Hemant Choubey
7			Biomedical Signal Processing	**12**	Jan 19, 2026	Apr 10, 2026	Dr. R.P Narwaria
8	**Minors**		Fundamentals of Semiconductor Devices	**12**	Jan 19, 2026	Apr 10, 2026	Dr. Madhav Singh
9			Integrated Circuits, Mosfets, OP-Amps and their Applications	**12**	Jan 19, 2026	Apr 10, 2026	Dr.Mukesh Kumar Mishra
10			Principles of Communication Systems - I	**12**	Jan 19, 2026	Apr 10, 2026	Dr. R.P Narwaria
11			Principles of Signals and Systems	**12**	Jan 19, 2026	Apr 10, 2026	Dr. Madhav Singh

Annexure-VIII

Item 9	To propose/update the list of **professional certification platforms** and **relating certifications** with specific domain/areas of certification. {representative list to be prepared} *The list of professional certification platforms and relating certifications with specific domain/areas of certification for B.Tech in Electronics Engineering is proposed as per the discussion with BoS members.*

S. No.	Name of Professional Certification platform	Link for professional certification platform	Details
1.	NPTEL / SWAYAM	https://swayam.gov.in/	All domain certification
2.	Coursera	https://www.coursera.org	
3.	EdX	https://www.edx.org/	
4.	Classcentral	https://www.classcentral.com/	
5.	Udemy	https://www.udemy.com	
6.	Chipedge	https://chipedge.com/	VLSI certification
7.	Exuberant solutions	https://exuberantsolutions.com/	Antenna certification
8.	Knowledge Academy	https://www.theknowledgeacademy.com/	Software certification
9.	CISCO CCNA	https://www.cisco.com/site/us/en/learn/training-certifications/certifications/enterprise/ccna/index.html	Communication and Networking certification

Annexure-IX

Item 10	To review and finalize the scheme structure &syllabi of PG Programmes, II semester (admitted in 2025-26 session) along with their COs. **NA**

Annexure-X

Item 11	To review and finalize the syllabus/module content for **Classified Novel Engaging Courses** to be offered in PG programmes, II semester (2025-26 admitted batch). **NA**

Annexure-XI

Item 12	To review and finalize the courses and syllabi for all courses of PG Programmes including the System Development Projects(MCA/MBA), IV semester (2024-25 admitted batch) along with their Course Outcomes (COs). **NA**

Annexure-XII

Item 13	To review the CO attainments, identify gaps and suggest corrective measures for the improvement in CO attainment levels for the courses taught in **second** semester, **January-June** 2025 Session.

https://drive.google.com/file/d/1w5XvF1gppPM9UkU3kuPDzxmKbNaeOxsb/view?usp=sharing

Annexure-XIII

Item 14	To consider and review the curriculum feedback from various stakeholders, its analysis and impact report. {Curriculum offered under MITS –DU structure (i.e. 2024-25 admitted batch) to be considered} *The curriculum feedback from various stakeholders has been analyzed and action taken was proposed.*

Alumni Feedback
https://drive.google.com/file/d/1jbGSZWWkaXYtzG7Bceu5a8OscLMuMzU8/view?usp=sharing

Employer Feedback
https://docs.google.com/document/d/1Vj7NfVKWzKwjPWrs-XVWAFTN7hXPcU73/edit?usp=sharing&ouid=101619927645802630196&rtpof=true&sd=true

Teacher Curriculum Feedback

https://drive.google.com/file/d/1rPaTE5hkgIzsA2SBJnMXXpBJtl5zk7PS/view?usp=sharing

Student Curriculum Feedback

https://drive.google.com/file/d/1Ptt2gY0nCS2M5sz3BUDocfPBYam7tOlb/view?usp=sharing

Annexure-XIV

Item 15	BoS Agenda under RGPV Structure as per the Annexure-1

https://drive.google.com/file/d/1tQxqTRJpl0gZr7KFgdBxykUxVUzxfSPd/view?usp=sharing