Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Choice Based Credit System (CBCS) in the Light of NEP-2020
Diploma EEE All Branches w.e.f. 2024

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTET301		Signals and Systems	60	20	20	-	-	3	0	0	3

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
1. To introduce the basic concepts of signals and systems.
2. To learn the concepts and analyze signals in time and frequency domains.
3. To familiarize students with Laplace and Z-transform techniques.
4. To understand basics of random signals and their use in real systems.

Course Outcomes (COs):
After the successful completion of this course, the student will be able to:
1. Classify and represent different types of signals and perform fundamental signal operations.
2. Apply Fourier, Laplace, and Z-transform techniques to analyze continuous and discrete-time systems.
3. Evaluate the response and properties of LTI systems for deterministic and random signals.

Syllabus:
UNIT I   7 Hrs.

Introduction to signal and systems: Classification. definition and representation of various types of Signals. representation of basic time domain functions. Various signal operations: shifting. scaling and inversion. System properties: Linearity, Causality, time invariance and stability.

UNIT II   6 Hrs.

Signal Transformation: Fourier transformation of continuous and discrete time signals and their properties. Fourier transformation-analysis with examples and properties. Convolution in time and frequency domain with magnitude and phase response of LTI systems.

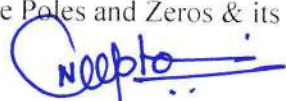**UNIT III**   6 Hrs.

Laplace Transform: Definition, Region of Convergence, Laplace Transform of some important functions, Convolution Integral and Inverse Laplace Transform. Properties of Laplace Transform. Concepts of s-plane Poles and Zeros & its Plot.

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COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
DTET301		Signals and Systems	60	20	20	-	-	3	0	0	3

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV   7 Hrs.

Z-Transforms: Basic principles of z-transform, z-transform definition, Relationship between z-transform and Fourier transform. Region of convergence and properties of ROC. Properties of z-transform. Poles and Zeros.

UNIT V   6 Hrs.
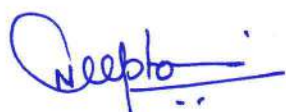
Random Signals & Systems: Definitions, mean values & moments, function of two random variables, concepts of correlation, spectral densities, response of LTI systems to random inputs.
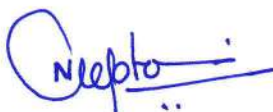
Text Books:
1. R. Kumar, *Signals and Systems*, PHI Learning, 2013.
2. P. Ramakrishna Rao, *Signals and Systems*, TMH Education, 2008.
3. A. Anand Kumar, *Signals and Systems*, PHI Learning, 2018.

Reference Books:
1. S. Sharma, *Signals and Systems*. New Delhi, India: S. K. Kataria & Sons, 2019.
2. K. Gopalan, *Signals and Systems*, Cengage Learning, 2011.
3. M. E. Van Valkenburg, *Network Analysis*, Pearson, 2015.
4. H. P. Hsu, *Signals and Systems (Schaum's Outline)*, Tata McGraw-Hill India, 2013.

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Choice Based Credit System (CBCS) in the Light of NEP-2020
Diploma in Mechatronics Engineering
(Common to MX/ET)
(2021-2024)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTMT302	DCC	Basic Digital Electronics	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
1. To present the Digital fundamentals, Boolean algebra, and its applications in digital systems
2. To present a problem oriented introductory knowledge of combinational digital circuits and its applications.
3. To explain the various semiconductor memories and related technology.
4. To introduce the sequential circuits involved in the making various digital circuits.

Course Outcomes (COs):
After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes.
The students will be able to:
1. Describe the number systems, conversions, and their applications.
2. Apply minimization techniques such as K maps, Tabular method etc. for the design of digital circuits.
3. Understand combinational and sequential circuits.
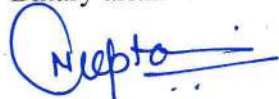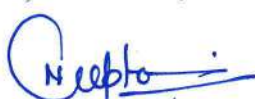4. Differentiate various type of memories and there use in different applications.

Syllabus

UNIT I
10 Hrs.

Binary Number System:
Binary arithmetic: addition, subtraction, multiplication and division, Complements: 1's, 2's, 9's

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and 10's. Subtraction using complements, Octal number system, Hexadecimal number system, Conversion among binary, octal, decimal, and hexadecimal number systems, Codes: BCD, Gray, Excess-3, the parity bit.

UNIT II   9Hrs.
Logic Gates and Boolean Algebra:
Primary Gates: symbol, operation and truth-table, NAND, NOR, EX-OR, EX-NOR gates: symbol, operation, truth- table, Positive and Negative logic, De Morgan's theorems, Universal Gate, Laws and theorems of Boolean algebra, simplification of Boolean expression, Sum of products (SOP) and product of sums (POS) expression, Karnaugh maps: Four variable K-maps and their simplification techniques, Don't care condition.

UNIT III   8Hrs.
Combinational Logic Circuits:
Arithmetic Circuits: Half adder, full adder, parallel binary adder, 1's complement subtractor circuit, 2's complement subtractor/adder circuits, 8421 adder, half and full subtractor, parallel binary subtractor, Binary to gray and gray to binary code converters, Decoder and Encoder, Multiplexer and Demultiplexers.

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Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV   7Hrs.
Memory and Programmable Logic:
Memory Classifications, RAM: Static and Dynamic, ROM: ROM, PROM, EPROM. Programmable Logic Array (PLA), Programmable Array Logic (PAL) and Structure. A/D and D/A Converter.

UNIT V   8Hrs.
Flip-Flops:
S-R latch, S-R flip-flops asynchronous and synchronous, timing diagram, truth table, excitation table, D flip floptiming diagram, truth table, excitation table T flip floptiming diagram, truth table, excitation table, J K flip flop timing diagram, truth table.

Text Books:
1. Mano M. M. and Ciletti M., "Digital Design", Pearson Education (2008) 4th ed.
2. Leach D. P., Malvino A. P., Saha G.," Digital Principles and Applications", TMH, (2014), 8th ed.

References:
1. Floyd T. L. and Jain R. P.," Digital Fundamentals", Pearson Education (2008) 10th ed.
2. Tocci R. and Widmer N., "Digital Systems: Principles and Applications", Pearson Education (2007) 10th ed.

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Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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List of Experiments:
1. To realize the basic logic gates.
2. To realize the NAND gate as a universal building block.
3. To realize the NOR gate as a universal building block.
4. To realize the HALF ADDER circuit
5. To realize the FULL ADDER circuit.
6. To realize the HALF SUBTRACTOR circuit.
7. To realize the AND-OR-INVERT circuit.
8. To realize the parity checker circuit.
9. To realize the exclusive-OR gate.
10. To realize the SR & JK flip-flop.

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Choice Based Credit System (CBCS) in Light of NEP-2020
BBA+MBA - II SEMESTER (2022-2026)

ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective
1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Examination Scheme
The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes
1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

COURSE CONTENT

UNIT I: Introduction to Environment Pollution and Control
1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

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Choice Based Credit System (CBCS) in Light of NEP-2020
BBA+MBA - II SEMESTER (2022-2026)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

*****Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT II: Climate Change and Environmental Challenges
1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

UNIT III: Environmental Management and Sustainable Development
1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

UNIT IV: Environmental Acts
1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

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Choice Based Credit System (CBCS) in Light of NEP-2020
BBA+MBA - II SEMESTER (2022-2026)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	
ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V: Role of Individuals, Corporate and Society
1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute, Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods
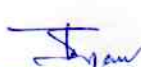
Suggested Readings:
1. Rogers, P.P., Jalal, K.F. , Boyd, J.A.(Latest Edition) . **An Introduction to Sustainable Development.** Earthscan
2. Kalam, A.P.J. (Latest Edition) . *Target 3 Billon: Innovative Solutions Towards Sustainable Development.* Penguin Books
3. Kaushik , A. and Kaushik (Latest Edition). *Perspectives in Environmental Studies.* New Delhi:
New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). *Environmental Studies.* S.K. Kataria and Sons.New Delhi
5. Bharucha, E. (Latest Edition). *Environmental Studies for Undergraduate Courses.* New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). *Environmental Science: towards a sustainable future* .New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). *Environmental Studies.* New York: Oxford University Press.

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COURSE CODE	CATE-GORY	COURSE NAME	THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTMEMT308	DCC	Basics of Mechanics and Thermal Energy	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

(A) This course aims at introduction of basics of engineering mechanics and basic concepts, laws & principles of thermodynamics. (B) It also covers the concept of Force, Pressure, stresses, zeroth, first and second law of thermodynamics. (C) It also includes the basic principles and applications of air standard cycles and engines.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes.
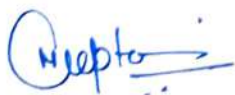1. To understand the basics of engineering mechanics.
2. To understand the application of forces, pressure and stresses.
3. To understand the laws of thermodynamics and its applications.
4. To understand the working and applications of various air standard cycles.
5. To understand the working and applications of I.C. Engines.

Syllabus

UNIT I   8 Hrs.
Static Forces: Introduction to Engineering Mechanics; Classification of Engineering Mechanics; Statistics, Dynamics, Kinematics, Kinetics etc.; Fundamental Laws of Mechanics.

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DTMEMT308	DCC	Basics of Mechanics and Thermal Energy	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT II   10 Hrs.

Force, Pressure and Stress; Free Body Diagram; Bow's Notation, Characteristics and Effects of a Force;System of Forces, Resolution of a Force, Composition of Forces, Resultant / Equilibrant of forces; Law of Parallelogram of Forces, Law of Triangle of Forces, Polygon Law of Forces;Lami's Theorem, Equilibrium of a Body Under Two/ Three/More Than Three Forces;Law of Superposition of Forces.

UNIT III   10 Hrs.

Basic concepts of thermodynamics: Thermodynamic definition, Systems, Characteristics of system boundary and control surface,Thermodynamic properties; definition and units, specific properties, pressure, specific volume, Thermodynamic state, state point, state diagram, path and process, quasi-static process, cyclic and non-cyclic; processes; Zeroth law of thermodynamics.

UNIT IV   9 Hrs.

First and Second Law of Thermodynamic: Statement of the First law of thermodynamics, Extension of the First law to control volume; steady flow energy equation (SFEE), applications. Limitations of first law of thermodynamics, Thermal reservoir, heat engine and heat pump theirefficiency, and COP. Kelvin-Planck statement of the Second law of Thermodynamics; Clausius statement of Second law of Thermodynamics, PMM I and PMM II, Numerical problems.

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Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V   8 Hrs.
I.C. Engine-Introduction to I.C. Engines, classification of I.C. Engine Components, working of two stroke and four- stroke cycle engines.
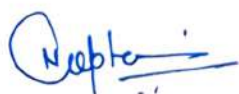**Air Standard cycles**-Definition andworking principle of Carnot, Otto, Diesel and Dual air Standard cycle. Calculate efficiency, their comparison and limitation of each cycle.

Text Books:
1. Prasad I.B., Applied Mechanics, Khanna Publication.
2. R.K. Rajput, Engineering Mechanics S. Chand & Co.
3. R.C. Hibbler –Engineering Mechanics: Statics & Dynamics.
4. Engineering Thermodynamics by P.K. Nag, McGraw-Hill Education 2011.

References:
1. Thermal Engineering by R.K. Rajput, Laxmi Publication House, 2010.
2. Engineering Thermodynamics by Onkar Singh.New Age International Publication,2013.
3. A Textbook of Engineering Thermodynamics by V.M. Domkundwar, Dhanpat Rai & Company, 2008.
4. Engineering Thermodynamics by Jones and Dugan, PHI Learning Pvt. Ltd. 2001.

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Choice Based Credit System (CBCS) Scheme in light of NEP2020
Diploma in Mechanical Engineering
SEMESTER III (2024-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
DTME308	AEC	COMPUTER AIDED DRAFTING LAB	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

Students will be skilled in creating and editing 2D shapes, managing layers for mechanical assemblies, using blocks and templates, and setting up prints while adhering to industry standards.
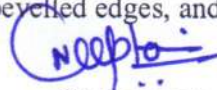
Course Outcomes (COs):

After completion of this course the student are expected to be able to demonstrate following knowledge skills and attitudes. The student will be able to
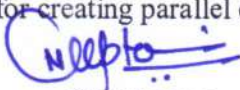
1. Students will be able to create and edit 2D shapes and objects.
2. Students will effectively organize mechanical assembly drawings by creating and managing layers for different components.
3. Students will be proficient in creating and utilizing blocks, attributes, and templates to streamline the drafting process.
4. Students will dimension mechanical drawings, customize dimension styles, set up prints, and collaborate on drawings, adhering to industry standards.
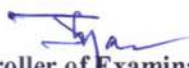
List of Practical's:

1. Create a detailed 2D drawing of a mechanical part using basic drawing commands (line, circle, arc).

2. Design a complex mechanical component using advanced draw commands like polyline, spline, region, and boundary.

3. Modify an assembly drawing by using commands such as fillet for rounding edges, chamfer for bevelled edges, and offset for creating parallel curves.

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4. Organize a mechanical assembly drawing by creating layers for different components (e.g., bolts, nuts, plates) and assign appropriate colours and linetypes.

5. Create static blocks of standard mechanical parts (e.g., bolts, nuts) and dynamic blocks of parts that can change sizes (e.g., adjustable clamps).

6. Use the Autodesk Design Center to import standard parts (e.g., bearings) into a new drawing. Customize a tool palette with frequently used mechanical components.

7. Add annotations and specifications to a mechanical drawing using single-line and multi-line text commands. Create and apply different text styles for clarity.

8. Apply different hatch patterns to sectional views of mechanical components. Edit hatch properties to distinguish between different materials.

9. Dimension a mechanical drawing (e.g., an engine part) using linear, radial, and angular dimensions. Customize dimension styles to adhere to industry standards.

10. Add multileader annotations to highlight specific features in a mechanical drawing, such as material type or surface finish. Customize the multileader style.

11. Create an isometric drawing of a mechanical assembly (e.g., a gearbox) using isometric snap and grid to represent 3D objects on a 2D plane.

12. Import a raster image of a hand-drawn mechanical sketch into AutoCAD, scale it, and trace over it to create an accurate vector drawing.

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13. Set up a layout with multiple viewports to display different views (e.g., front, top, and side) of a mechanical part. Customize the plot settings and plot the drawing to a PDF or printer.

Reference Books:
1. *AutoCAD 2024: A Problem-Solving Approach, Basic and Intermediate by Sham Tickoo, CADCIM Technologies.*
2. *AutoCAD 2024 For Dummies by Bill Fane and David Byrnes, Wiley.*
3. *Mastering AutoCAD 2024 and AutoCAD LT 2024 by Brian C. Benton and George Omura, Sybex.*

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