ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2024-25

ELECTRONICS & TELECOMMUNICATION ENGINEERING

SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	24ET301T	Microprocessors & Interfacing	3	1	-	4	20	20	60	100	3
2.	PCC	24ET301P	Microprocessors & Interfacing Lab	-	-	2	1	..	25	25	50	….
3.	ESC	24ET302T	Problem Solving Using Python	3	-	-	3	20	20	60	100	3
4.	ESC	24ET302P	Problem Solving Using Python Lab	-	-	2	1	..	25	25	50	…
5.	PCC	24ET303T	Sensors & Actuators	2	-	-	2	10	10	30	50	1.5
6.	PCC	24ET304T	Signals & Systems	3	1	-	4	20	20	60	100	3
7.	SEC	24ET341P	Career Development – III	-	-	2	1	…	50	-	50	-
8.	ELC	24ET305P	Micro Project I*	-	-	2	1	….	50	--	50	-
9.	VEC	24ET306T	Economics & Management	3	-	-	3	20	20	60	100	3
10.	MDM	24ET331M	MDM – I (Refer from MDM Basket)	2	-	-	2	10	10	30	50	1.5
			Total	16	2	8	22	100	250	350	700	

MDM I	
24ET331M	Electronics Devices & Applications

Chairman - BoS	Dean – Academics	July 2024	2.1	Applicable for 2025-26
		Date of Release	Version	

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET301T	Microprocessors & Interfacing	3	1	-	4	40	60	100

Course Objectives	Course Outcomes
1.To study fundamentals of microprocessor systems. 2. To study architecture of microprocessor and to understand the concept of memory organization, stack memory, Assembly language programming. 3. To study different interrupt techniques. 4. To study interfacing of microprocessor with different peripheral devices.	After completion of the course students are able to, 1. Understand the organization of a computer system. 2. Demonstrate 8085 addressing modes, instructions, timing diagrams, and simple assembly programs using stack and subroutines. 3. Apply advanced 8085 instructions, explain interrupts, and evaluate data transfer methods (serial/parallel, sync/async). 4. Analyze IN/OUT instructions, explain 8255 & 8253/54 architecture, and design basic interfacing circuits. 5. Understand 8086/8088 architecture, memory organization, and interrupts; apply instructions and addressing modes in programming.

UNIT- I: Fundamentals of Microprocessor-based Systems	**[9 Hrs]**
Computer organization with MPU, Bus systems (Data, Address, Control), Intel 8085A architecture, 8085A pin diagram, Flag register structure, Memory organization, Linear decoding, Absolute decoding	
Unit –II: Instruction Set and Programming Basics	**[9 Hrs]**
Addressing modes, 8085A instruction set, Timing diagrams, Stack concepts, PUSH & POP instructions, CALL & RETURN instructions, Stack manipulation, Simple and nested subroutines, Basic assembly language programs	
Unit –III: Advanced Programming and Data Transfer	**[9Hrs]**
Advanced instructions in 8085A, Programming techniques, Interrupt system in 8085, Data transfer methods: Serial communication, Parallel communication, Synchronous communication, Asynchronous communication	
UNIT- IV: Interfacing and Peripheral Devices	**[9 Hrs]**
IN/OUT instructions, Timing diagrams of I/O operations, Programmable Peripheral Interface (PPI) 8255: Block diagram,Pin functions, Features, Modes of operation, Interfacing with 8085. Programmable Interval Timer 8253/8254: Block diagram, Pin functions, Features, Modes of operation, Interfacing with 8085	
Unit -V: Intel 8086/8088 Microprocessor and Programming	**[9 Hrs]**
Architecture of 8086/8088, Pin diagram and functions, Key features of 8086/8088, Operating modes, Memory organization and interfacing, addressing modes in 8086, Complete instruction set, Interrupt structure	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Microprocessor Architecture, Programming and Applications with the 8085	Ramesh S. Gaonkar	6th	Penram International Publishing
2	Advanced Microprocessors and Peripherals	K. M. Bhurchandi, A. K. Ray	3rd	McGraw Hill Education
3	Microprocessors and Interfacing: Programming andHardware	Douglas V. Hall	2nd	McGraw Hill Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The 8086 Microprocessor: Programming & Interfacing	Kenneth J. Ayala	Revised	Cengage Learning
2	Fundamentals of Microprocessors and Microcontrollers	B. Ram	Latest	Dhanpat Rai Publications
3	Microprocessor and Microcontroller Systems	Krishna Kant	1st	PHI Learning Pvt. Ltd.

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET301P	Microprocessors & Interfacing Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. Develop an understanding of the architecture, instruction set, and working principles of the 8085 and 8086 microprocessors. 2.Provide hands-on experience in Assembly Language Programming (ALP) for performing arithmetic, logical, data transfer, and sorting operations. 3. Familiarize students with interfacing techniques using peripheral devices such as the 8255 PPI and trainer kits for practical applications.	After completion of the course students are able to, 1. Demonstrate the fundamental knowledge of 8085 and 8086 microprocessor architecture, instruction formats, and their trainer kits. 2. Apply assembly language programming concepts to implement arithmetic, logical, relational, and sorting operations on microprocessors. 3. Analyse and implement interfacing techniques with peripherals such as 8255 to design simple microprocessor-based applications. 4. Develop problem-solving skills and debugging ability through simulation and execution of microprocessor-based assembly programs.

Minimum 8 practical based on the syllabus.

Sr.NO	List of the experiment
1	Introduction of 8085 Microprocessor and Its Trainer kit
2	Assembly Language Programming in 8085 Microprocessor: Arithmetic Operation
3	Assembly Language Programming in 8085 Microprocessor: Data Transfer
4	Assembly Language Programming in 8085 Microprocessor: Arithmetic Operation
5	Assembly Language Programming in 8085 Microprocessor: Logical (Rotate) Operation
6	Assembly Language Programming in 8085 Microprocessor: Relational Operation
7	Assembly Language Programming in 8085 Microprocessor: Sorting Operation
8	Assembly Language Programming in 8085 Microprocessor: 8255 Interfacing
9	Assembly Language Programming in 8086 Microprocessor based Data Transfer instructions
10	Assembly Language Programming in 8086 Microprocessor: Arithmetic Operations

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Microprocessor Architecture, Programming and Applications with the 8085	R. Gaonkar	2014	Prentice Hall
2.	Advanced Microprocessor and peripherals	K. M. Bhurchandi and A. K. Ray	3rd	Mc Graw Hill

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET302T	Problem Solving using Python	3	-	-	3	40	60	100

Course Objectives	Course Outcomes
1. To introduce fundamental concepts of algorithmic problem-solving and basic programming constructs using Python. 2. To develop proficiency in Python programming by implementing conditionals, loops, functions, and object-oriented programming concepts. 3. To apply file handling, exception handling, and recent Python libraries for real-world problem-solving.	After completion of the course students are able to, 1. Develop algorithmic solutions using pseudo-code and flowcharts, applying iteration and recursion techniques. 2. Demonstrate the use of Python's modules for problem-solving. 3. Implement conditionals, loops, and function-based programming, including recursion and string manipulations. 4. Analyze dictionaries, list comprehensions, and object-oriented programming concepts such as inheritance and polymorphism. 5. Apply file handling and exception handling techniques in Python and explore the basics of Pandas and recent trends in Python.

Unit I:	**[10Hrs]**
Algorithmic Problem Solving: Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).	
Unit II:	**[10Hrs]**
Python interpreter and interactive mode: values and types: int, float, Boolean, string, and list; variables, expressions, statements, Tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments	
Unit III:	**[9Hrs]**
Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional **Iteration:** state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices	
Unit IV:	**[9Hrs]**
Dictionaries: operations and methods; advanced list processing – list comprehension; Object Oriented Programming**:** Classes and objects-inheritance, polymorphism.	
Unit V	**[7Hrs]**
File Handling and Exception Handling: Overview of exception classes and Types: try, except, finally: File processing: reading and Writing files, Introduction to Pandas, Recent Trends in Python,	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Python Programming using problem solving Approach,	Reema Theraja,	1	Oxford University Press
2	A Byte of Python By	C. H. Swaroop,	2014	GitBook

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Python: The Complete Reference	Martin C. Brown	--	Mc. Graw Hill Education.

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET302P	Problem solving using Python Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. Develop Practical Coding Skills: Enable students to gain hands-on experience in writing and executing Python programs 2. Apply Problem-Solving Techniques: Encourage students to use Python to solve real-world problems by applying control structures, data structures, and functions. 3. Introduce Advanced Python Concepts such as object-oriented programming, regular expressions, and data visualization, preparing them for practical applications in their field.	After completion of the course students are able to, 1. To write and execute Python programs demonstrating correct usage of basic syntax, data types, and operators. 2. To demonstrate the ability to implement control structures such as loops and conditional statements to solve problems efficiently. 3. To adept at defining and calling functions, passing arguments, and returning values, as well as creating and using Python modules for modular programming. 4. To create and manipulate fundamental data structures and applying them to solve practical problems. 5. To demonstrate an understanding programming tasks and real-world applications.

Sr.NO	List of the experiment
1	Writing simple programs to demonstrate basic syntax and data types.
2	Practice programs for input/output operations and type conversions.
3	Programs to demonstrate control structures
4	Programs to demonstrate loops.
5	Writing functions for various mathematical and logical operations.
6	Creating and using modules in Python.
7	Programs to manipulate strings and use string methods.
8	Creating and manipulating lists, tuples, dictionaries, and sets.
9	Real-world applications of data structures in solving problems.
10	Creating classes and objects, and implementing OOP concepts.
11	Writing programs for file handling and exception management.
12	Using regular expressions to search and manipulate text.

Books and References

S.N	Title	Authors	Edition	Publisher
1	Python: The Complete Reference	Martin C. Brown	-	Mc. Graw Hill Education.

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET303T	Sensors & Actuators	2	-	-	2	20	30	50

Course Objectives	Course Outcomes
1. Understand basics of sensors, transducers, and measurement systems. 2. Study various types of sensors and their applications. 3. Learn about actuators and sensor-actuator integration.	Students are able to, 1. Explain sensor principles and characteristics. 2. Identify and apply suitable sensors for various domains. 3. Describe actuator types and sensor-actuator systems.

Unit I : Basics of Sensors and Transducers	**[8Hrs]**
Introduction to Sensors and Transducers, Sensor Characteristics, Generalized Measurement System, Transduction Principle	
UNIT 2: Different Types of Sensors and Their Applications	**[12 Hrs]**
Mechanical and Displacement Sensors, Temperature and Pressure Sensors, Light and Optical Sensors, Magnetic and Proximity Sensors, Agricultural Sensors, Special Sensors, Application Domains, Smart sensors	
UNIT 3: Actuators and Their Applications	**[10 Hrs]**
Introduction to Actuators, Non-Electrical Actuators, Micro and Smart Actuators, Sensor–Actuator Integration & Applications	

Text Books

S.N	Title	Authors	Edition	Publisher
1	A course in Electrical and Electronics Measurements and Instrumentation	A. K. Sawhney	17	Dhanpat Rai & Co.
2	Sensors and Transducers	D. Patranabis	2	PHI

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Instrumentation Measurement and Analysis	B.C. Nakra and K.K. Chaudhry	4	McGraw Hill

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET304T	Signals & Systems	3	1	-	4	40	60	100

Course Objectives	Course Outcomes
1. The primary objective of this course is to provide a thorough understanding and analysis of signals and systems 2. Understand different concepts in the context of signals & systems and lay down the foundation for advanced courses in telecommunication engineering	After completion of the course students are able to, 1. Define & classify signals along with their mathematical representation, basic operations on signals and their properties 2. Define & classify systems along with properties, interconnection their block diagram representation and description by use of differential and difference equations 3. Analyze periodic and aperiodic signals using Fourier Series and Fourier Transform 4. Analyze continuous time LTI systems using Laplace transform 5. Analyze and explain Sampling theory involved in analysis of signals

Unit I: SIGNALS	**[10Hrs]**
Basics of Signals & Systems: Introduction, Continuous-Time and Discrete-Time Signals, Examples and Mathematical Representation, Classification of signals, Basic Operations on Signals, Elementary Signals, singularity functions	
Unit II: SYSTEMS	**[8Hrs]**
Continuous-Time LTI Systems: Classification of Systems, The Convolution Integral, Properties of LTI Systems, interconnection of systems in series / parallel, Relations between LTI system properties and impulse response, Step response, Causal LTI Systems Described by Differential and Difference Equations, Block Diagram Representations of First-Order Systems	
Unit -III FOURIER SERIES & FOURIER TRANSFORM	**[10Hrs]**
Fourier Series representation of periodic signals: Fourier Series Representation of Continuous-Time Periodic Signals, Convergence of the Fourier Series, Representation of Aperiodic Signals: The Continuous-Time Fourier Transform, The Fourier Transform for Periodic Signals, Properties of the Continuous-Time Fourier Transform, The Magnitude-Phase Representation of the Fourier Transform of LTI Systems	
UNIT- IV: LAPLACE TRANSFORM	**[9Hrs]**
Representing signals by using CT complex exponential: Laplace transforms, poles and zeros, the region of Convergence, Inverse Laplace Transform, properties of Laplace Transform, the unilateral Laplace transform, properties of the unilateral Laplace transform, inversion of the the unilateral Laplace Transform, the bilateral Laplace transform, properties of the bilateral Laplace transform, inversion of the the bilateral Laplace Transform, Analysis and Characterization of LTI Systems Using the Laplace	
Unit -V: SAMPLING THEORY	**[8 Hrs]**
Introduction, Representation of a Continuous-Time Signal by Its Samples, The Sampling Theorem, Impulse-Train Sampling, Sampling with a Zero-Order Hold, Reconstruction of a Signal from Its Samples Using Interpolation, oversampling and under sampling, The Effect of Under sampling: Aliasing, Anti- Aliasing filter, Reconstruction: Ideal Inter polators, zero order hold and first order hold	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Signals and Systems	Alan V. Oppenheim, Alan S. Willsky	2	Pearson Education
2	Signals and Systems	Simon Haykin, Barry Van Veen	2	Wiley
3	Signals and Systems	A. Anand Kumar	1	PHI

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Linear Systems & Signals	B.P. Lathi	2	Oxford University Press, 2004
2	Signals , Systems and Transforms	Charles Phillips	3	Pearson
3	Fundamentals of Signals and Systems	Michel J. Robert	--	MGH International

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ET331M	MDM I Electronics Devices and Applications	2	-	-	2	20	30	50

Course Objectives	Course Outcomes
1. To introduce the fundamental concepts of electronic components, devices, and circuits used in engineering systems. 2. To develop the ability to design and analyse simple analog and digital circuits using operational amplifiers, timers, and logic gates. 3. To explore the interdisciplinary applications of electronics and familiarize students with basic automation using microcontrollers.	At the end of the course, students will be able to: 1. Explain basic electronic components and devices with their applications. 2. Apply op-amps, timers, logic gates, and microcontrollers to design simple circuits. 3. Analyse applications of electronics in interdisciplinary engineering fields.

UNIT 1: Fundamentals of Electronic Components and Devices	**[9Hrs]**
Overview of electronics in engineering systems, Introduction to passive components: Resistors, Capacitors, Inductors – types and applications, Semiconductor basics: Diodes, Zener diodes, LEDs – working principles and simple circuits, Transistors (BJT & MOSFET): , Introduction and use as switches and amplifiers, Concept of power supplies and voltage regulation	
UNIT 2: Circuit Building Blocks and Digital Fundamentals	**[12 Hrs]**
Operational Amplifiers: Basics and simple applications (buffer, comparator), IC 555 Timer: Astable and monostable modes, Introduction to Number Systems and Boolean Algebra, Logic Gates: AND, OR, NOT, NAND, NOR – truth tables and basic circuits, Introduction to microcontrollers (Arduino/Raspberry Pi): Concept and role in system automation	
UNIT 3: Interdisciplinary Applications of Electronics	**[9 Hrs]**
Role of electronics in: Mechanical Engineering: Speed sensors, temperature controllers, vibration monitors, Civil Engineering: Structural monitoring, smart lighting, water level alarms, Computer & IT: IoT devices, embedded systems, user interface electronics, Electrical Engineering: Energy monitoring, converters, power electronics, Biomedical Engineering: Health sensors, wearable electronics, basic diagnostic tools	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Electronic Devices and Circuit Theor	Robert L. Boylestad, Louis Nashelsky	10	Pearson Education
2	Principles of Electronics	V.K. Mehta, Rohit Mehta	4	S. Chand & Company Ltd.

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Electronic Principles	Albert Malvino, David Bates	8	McGraw Hill Education

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24ET306T	Economics & Management	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To provide awareness about Industrial economics, management, banking practices and their impact on business.	1. Apply managerial economics concept in business analysis and business decision making. 2. Explain relationships between production and costs and understand different forms of market structures. 3. Assess impact of macroeconomics and government policies on business and economy. 4. Recognize the functions of management and marketing management for business decisions. 5. Explore role of financial management in business and decision making.

Unit I	**[9Hrs]**
Economics, Classification of economics, Industrial economics, Consumer demand, Law of Demand, Determinants of demand, Demand forecasting, Law of supply, Utility, Law of diminishing marginal Utility, Types of Elasticity of demand	
Unit II	**[9Hrs]**
Concept of Production, Factors of Production, Laws of return, Cost concepts and types of cost, cost curves, Market Structures- Perfect competition, Monopoly, Oligopoly, and Monopolistic competition.	
Unit III	**[9Hrs]**
The functions of central bank, Inflation, Deflation, Recession. Measures to control Inflation, National income, GDP, GNP, Liberalization, Privatization and Globalization	
Unit IV	**[9Hrs]**
Definition of management, functions of management – planning, organizing, directing, Controlling, human resources Management, Marketing Management, Concepts of Marketing, Marketing mix, Methods of pricing, channels of distribution, advertising and sales promotion.	
Unit V	**[9Hrs]**
Financial Management, nature and scope of financial management, Sources of finance, Types of capital, Brief outline of profit and loss account, balance sheet, Budgets and types of budgets, Ratio analysis	

Text Books

S. N	Title	Authors	Edition	Publisher
1.	Managerial Economics	D.N. Dwivedi	8th	Vikas Publishing
2.	Modern Economic Theory	K.K. Dewett	2005	S. Chand Publisher

Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Industrial Organization and Industrial economics	T.R. Banga, S.C. Sharma	2006	Khanna Publishers
2.	Industrial Management	Dr.I.K. Chopde, Dr.A.M. Sheikh	Revised edition	S. Chand Publisher