ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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

B. Tech. Scheme of Examination & Syllabus 2022-23

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET501T	Microprocessor and Microcontroller	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
1. To study fundamentals of microprocessor and microcontroller systems. 2. To study architecture of microprocessor & to understand the concept of memory organization, stack memory, Assembly language programming. 3. To study different interrupt techniques. 4. To study interfacing of microprocessor & microcontroller with different peripheral devices.	1. Explain internal architecture, Memory organization, Instruction set of 8086/8088 microprocessors, Pentium and different peripheral devices. 2. Develop program and interfacing of 8086 with differentperipheral devices. Design Interfacing of 8086 with Timer, USART peripheral devices, the concept of 8087 Numeric- coprocessor & its use in practical application. 3. Explain the concept of internal architecture, Memoryorganization and Instruction set of 8051microcontroller Develop assembly language program and embedded c program for 8051 microcontroller. 4. Illustrate the Interfacing of 8051 with different peripheral devices.

Unit 1 : Intel 8086/8088 microprocessor & Programming: 8086/8088 microprocessor	**[8Hrs]**
Pin diagram, Architecture, features and operating modes, Clock generator 8284, memory organization & interfacing, Addressing modes, complete instruction set, Interrupt structure	
Unit 2 : 8086 ALP & Peripheral Interfacing	**[8Hrs]**
8086 ALP & Peripheral Interfacing : Assembly language programming of 8086, I/O interfacing, Interfacing of peripherals like 8255 PPI, multiplexed 7-seg display & matrix keyboard interface using 8255, Programmable interval timer/counter 8254; 8087 Numeric co-processor; Architecture, interfacing with 8086, instruction set.	
Unit 3: Introduction to 8051 microcontrollers	**[8Hrs]**
Pin diagram, architecture, features & operation, Ports, memory organization, SFR's, Flags, Counters/Timers, Serial ports. Interfacing of external RAM & ROM with 8051. 8051 Interrupt structure, Interrupt vector table with priorities, enabling & disabling of interrupts	
Unit 4: 8051 Microcontroller & Programming	**[8Hrs]**
Instruction set of 8051; data transfer, logical, arithmetic & branching instructions, Addressing modes, Assembly language programming examples, introduction to Embedded C, programming examples	
Unit 5 : 8051 Timers	**[6Hrs]**
8051 Timers , Serial and interfacing: Counter/Timer programming in various modes. Serial communication, Operating modes, serial port control register, Baud rates. Interfacing keyboard, LED display, ADC & DAC interface, stepper motor interface,Embedded C programming examples	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming & Interfacing of 8086/8088	D.V. Hall		TMH.
2	Microprocessor 8086/8088 Family Programming & Interfacing	Liu & Gibson		
3	The 8051 Microcontroller and Embedded system	M.A. Mazidi & J.G. Mazidi	3	Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Microcontrollers	Peatman	3	Mc Graw Hill
2	Introduction to Microprocessors for	P. K. Ghosh, P. R.		PHI Publication

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET501P	Microprocessor and Microcontroller Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To perform a practical on microprocessor and microcontroller based system. 2. To study assembly language programming skills. 3. Interface different peripherals with microprocessor and microcontroller with its use.	1. Outline the procedure for execution Programs on 8086,8051 trainer 2. Demonstrate the concept of Assembly languages structure and programming skills 3. Develop interfacing of various peripherals with 8086 and 8051. 4. Simulate the programs on different software platforms Design and develop the Mini project based on real life problems..

Sr. No	Name of Practical
1	To study 8086 microprocessor programming on kit and MASM software.
2	Write a program for addition, subtraction, multiplication and division of 16-bit numbers on 8086 trainer kit and MASM software
3	Write a program for addition of two 32-bit numbers on 8086 microprocessor trainer kit and MASM software
4	Write an ALP to find the largest number from a set of 10 data bytes. Assume that the series is stored at memory location 5000: 4000 H.
5	Write a program to add ‘n’ 8-bit numbers on 8086 microprocessor trainer kit and MASM software.
6	Write a program to compare two data strings on 8086 microprocessor trainer kit and MASM software.
7	Write a separate program for addition, subtraction, multiplication and division of 8-bit numbers on using Keil and on 8051 Micro-controller Trainer kit.
8	Write a program to transfer block of ten bytes of data stored from location 40H onwards to destination location 50H onwards on 8051 microcontroller.
9	Implement the interfacing of LED's with 8051 micro-controller and WAP to blinking the LED.
10	Implement the interfacing of 7 segment display with 8051 micro-controller and WAP to display 0 to9 digit continuously.

Reference : Lab Manual

Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming & Interfacing of 8086/8088	D.V. Hall		TMH.
2	Microprocessor 8086/8088 Family Programming & Interfacing	Liu & Gibson		
3	The 8051 Microcontroller and Embedded system	M.A. Mazidi & J.G. Mazidi	3	Pearson Education

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B. Tech. Scheme of Examination & Syllabus 2022-23

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET502T	Object Oriented Programming and Data structure	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
1. Comprehend Core OOP Principles. **2.** Develop Robust Problem-Solving Skills. **3.** Design and Implement Data Structures Implementation. **4.** Understand and Apply Advanced Algorithms.	1. Apply OOP Concepts. 2. Implement Inheritance and Polymorphism. 3. Design and Implement Data Structures. 4. Analyze Sorting and Searching Algorithms.

Unit 1: Data abstraction and Overloading	**[6Hrs]**
Overview of C++ – Structures – Class Scope and Accessing Class Members – Reference Variables – Initialization – Constructors – Destructors – Member Functions and Classes – Friend Function – Dynamic Memory Allocation – Static Class Members – Overloading: Function overloading and Operator Overloading.	
Unit 2: Inheritance and Polymorphism	**[6Hrs]**
Base Classes and Derived Classes – Protected Members – Casting Class pointers and Member Functions – Overriding – Public, Protected and Private Inheritance – Constructors and Destructors in derived Classes – Implicit Derived – Class Object To Base – Class Object Conversion – Composition Vs. Inheritance – Virtual functions – This Pointer – Abstract Base Classes and Concrete Classes – Virtual Destructors – Dynamic Binding.	
Unit 3: Introduction to Data structures	**[6Hrs]**
Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists - Stack ADT – Queue ADT -Trees-Application of Trees- Graph Traversals – Representation of Graphs – Breadth-first search – Depth-first search.	
Unit 4: Sorting and searching	**[6Hrs]**
Sorting algorithms: Insertion sort - Quick sort – Merge sort – Searching: Linear search – Binary search.	

Text Books :

S.N	Title	Authors	Edition	Publisher
1	C++ Primer	Stanley B. Lippman	5th Edition	Addison-Wesley
2	Data Structures Using C++	D.S. Malik	2nd Edition	Course Technology
3	The C++ Standard Library: A	Nicolai M. Josuttis	2nd Edition	Addison-Wesley
4	Algorithms in C++	Robert Sedgewick	3rd Edition	Addison-Wesley

Reference Books :

S.N	Title	Authors	Edition	Publisher
1	The C++ Programming Language	Bjarne Stroustrup	4th Edition	Addison-Wesley
2	Data Structures and Algorithm Analysis in C++	Mark A. Weiss	4th Edition	Pearson Education
3	Object-Oriented Programming in C++	Robert Lafore	4th Edition	Sams Publishing
4	Effective C++: 55 Specific Ways to Improve Your Programs and Designs	Scott Meyers	3rd Edition	Addison-Wesley

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET502P	Object Oriented Programming and Data structure Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. Hands-on Experience with OOP Concepts. 2. Develop Practical Problem-Solving Skills. 3. Implement and Manipulate Data Structures. 4. Practical Application of Algorithms. 5. Enhance Code Reusability and DebuggingSkills.	1. Implement Object-Oriented Programming concepts such as classes, objects, inheritance, polymorphism, and encapsulation in C++. 2. Develop the ability to apply OOP techniques to solve complex, real-world problems effectively in a lab setting. 3. hands-on experience in designing, implementing, and manipulating various data structures 4. implement, optimize, and evaluate the performance ofsorting and searching 5. Write modular, reusable, and maintainable code, improving debugging and testing skills.

Experiments based on the following topics,

1	Implementing Structures
2	Class and Object Creation
3	Constructors and Destructors
4	Function and Operator Overloading
5	Single Inheritance
6	Multiple Inheritance
7	Stack ADT
8	Queue ADT
9	Quick Sort
10	Binary Search

Text Books :

S.N	Title	Authors	Edition	Publisher
1	C++ Primer	Stanley B. Lippman	5th Edition	Addison-Wesley
2	Data Structures Using C++	D.S. Malik	2nd Edition	Course Technology
3	The C++ Standard Library: A Tutorial and Reference	Nicolai M. Josuttis	2nd Edition	Addison-Wesley
4	Algorithms in C++	Robert Sedgewick	3rd Edition	Addison-Wesley

Reference Books :

S.N	Title	Authors	Edition	Publisher
1	C++ Primer	Stanley B. Lippman	5th Edition	Addison-Wesley
2	Data Structures Using C++	D.S. Malik	2nd Edition	Course Technology

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET503T	Analog and Digital Communication	3	-	0	3	30	70	100

Course Objectives	Course Outcomes
1. To study basic components of digital communication systems. 2. To understand the designing aspects of optimum receivers for digital modulation techniques. 3. To study the analysis of error performance of digital modulation techniques. 4. To study the designing of digital communication systems under given power, spectral and error performance constraint.	After completion of the course students are able to, 1. Explain the working principles of basic building blocks of analog communication system. 2. Explain the working principles of basic building blocks of a digital communication system. 3. Demonstrate and elaborate the concept of source and waveformcoding techniques 4. Illustrate digital modulation techniques. 5. Demonstrate and elaborate the concept of channel coding and decoding techniques, and describe spread spectrum analysis.

UNIT- I:	**[10 Hrs]**
Base band & Carrier communication, Introduction of modulation, Equation of modulation, Generation of AM (DSBFC) and its spectrum, Modulation Index, Power relations applied to sinusoidal signals, Comparison of AM, FM and PM, Pulse Analog modulation: PAM PWM & PPM.	
Unit –II:-	**[10 Hrs]**
Model of digital communication system, Gram Schmitt Orthogonalization procedure, signal space concept, Geometric interpretation of signals. PCM – Generation & reconstruction, Bandwidth requirement of PCM, Differential PCM, Delta Modulation & Adaptive DM. (Only Block diagram treatment).	
Unit –III:-	**[10 Hrs]**
Source coding Theorem, Shannon Fano Coding, Huffman coding-Z encoding algorithm, Rate distortion theory for optimum quantization, scalar & vector quantization. Waveform coding methods: ADPCM, Adaptive Sub-Band & Transform coding, LP & CELP coding.	
UNIT- IV:	**[8 Hrs]**
Coherent Binary: QPSK, MSK, Gaussian MSK, DPSK, Memory less modulation methods, linear modulation with Memory, nonlinear modulation methods with memory: CPFSK, CPM.Binary: QPSK, MSK, Gaussian MSK, DPSK, CPFSK, CPM.	
Unit -V:	**[10 Hrs]**
Introduction to Galois field, Construction of Galois field GF (2 m) & its basic properties. Types of error control: Forward error correction (FEC), Automatic repeat request system (ARQ). Convolution encoding and decoding distance properties, Viterbi algorithm and Fano algorithm. Spread - Spectrum methods: - Study of PN sequences, direct sequence methods, Frequency hop methods, slow and fast frequency hop.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Digital communication	Simon Haykin		WEP
2	Error Control Coding	Shu Lin & Daniel		TMH
3	Digital Communication	J.S.Chitode		

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Communication Systems	Simon Haykin	Fourth Edition	John Wiley & Sons
2	Principles of Communication Systems	Taub & Schilling		Tata McGraw-Hill

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET503P	Analog and Digital Communication Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To study the concept of communication based on RF-AF in digital domain. 2. To study the role of sampling factor for analyzes the digital communication systems 3. To study & Design the digital communication systems. 4. To study line coding and its application.	After completion of the course students are able to, 1. Test the concept of the analog communication-based systems and techniques 2. Examine and analyze the digital communication-based circuit design 3. Design and conduct experiments for testing digital communication circuits and systems. 4. Analyze the different coding technique for design and modeling of digital communication. 5. Formulate and solve digital communication circuits and systems problems.

List of Practical's

1.	To generate Amplitude Modulated wave using different techniques and plot its waveform.
2.	To generate Frequency Modulated wave using different techniques and plot its waveform.
3.	To study generation of SSB-SC using balanced modulator
4.	To study generation of DSB-SC signal.
5.	To Study and perform Error Detection and Correction codes.
6.	To study the performance of adaptive Delta modulator/Demodulator circuits.
7.	To study and observe the effect of signal Distortion using EYE-Diagram.
8.	To Study and perform generation & reception of BPSK & perform its spectral analysis.
9.	To Study and perform generation & reception of FSK & perform its spectral analysis.
10.	To Study and perform generation & reception of QPSK & perform its spectral analysis.
11.	To Study and perform generation & reception of MSK & perform its spectral analysis.
12.	To Study and perform generation & reception of DPSK & perform its spectral analysis.
13.	Write and execute Scilab/Matlab code for generation of BPSK / Prepare Simulink Model for BPSK.

Reference : Lab Manual

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET504T(i)	Professional Elective - I (Antenna and Wave Propagation)	2	-	0	2	15	35	50

Course Objectives	Course Outcomes
1. To acquaint students with various basics of waveguides, transmission line characteristics, radiating elements, antennas, their principle of operation, analysis and their applications. 2. The student will able to understand the features of Antenna array, Micro-strip antenna and reflector antenna.	After completion of the course students are able to, 1. Examine transmission line characteristics. 2. Design & analyze the wired antenna parameters. 3. Design and characterize antenna arrays. 4. Analyze and illustrate the operation of aperture antenna, reflector antenna and micro-strip Antennae.

UNIT- I: Transmission lines	**[6 Hrs]**
Transmission line equations and their solution. Transmission line parameters, characteristic impedance, propagation constant, attenuation constant and phase constant, waveformdistortion,distortionlesstransmission lines, reflection coefficient and VSWR. Equivalent circuits of transmission lines, open and short circuited lines, smith chart.	
Unit –II:- Linear wire antennas	**[6 Hrs]**
Retarted Potential, Infinitesimal dipole, its radiation field, radiation resistance, near field, far field directivity, finite length dipole, half wave length dipole, Monopole and their application, folded dipole.	
Unit –III:- Antenna Array	**[6 Hrs]**
Array of two isotropic point sources, non – isotropic sources, principle of pattern multiplication, linear arrays of n elements, broadside, End fire, radiation Pattern, directivity, Beam width and null directions, array factor, Antenna analysis using Binomial Array & Dolph-Tschebyscheff. Log-periodic and Yagi-Uda antennas	
UNIT- IV: Microstrip antennas & Reflector Antennas	**[6 Hrs]**
Radiation Mechanism of Microstrip antenna, feeding methods. Rectangular & circular patch antenna. Simple reflectors, the design of a shaped Cylindrical reflector, Radiation patterns of Reflector Antennas, Dual shaped Reflector Systems, Plane reflector, Corner reflector, parabolic reflector, horn antenna, aperture antenna.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Antenna Theory analysis and design	Costantine A. Balanis	2	John Wiley ublication
2	Antenna and Wave propagation	K.D. Prasad	2	Satya Prakashan
3	Electromagnetic	Jordan Balmann,	1	Prentice Hall of India

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Antenna & Wave Propagation	Sisir K Das		Mc Graw Hill
2	Antenna and wave Propagation	Harish A. R		Oxford University
3	Antennas and Radio Propagation,	R.E. Collins,		Mc Graw -Hill

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET504T(ii)	Program Elective - I (Computer Communication Networks)	2	-	0	2	15	35	50

Course Objectives	Course Outcomes
1. To understand the basic concept of computer communication network 2. To recognize the computer network layer 3. To describe IP addressing scheme & Hardware aspect of network communication. 4. To clarify network security & administration	1. Illustrate the requirement of theoretical & practical aspect of computer network. 2. Explain the different wired & wireless LAN standards. 3. Classify various protocols used in network layer, application layer for routing, streaming and transport layer for reliable and unreliable data communication. 4. Explain and analyze the concept of computer network security using different tools

Unit 1: Introduction to Computer Networks	**[4 hrs]**
Uses of computer Network, Network Software-design Issues for layers, Service primitives and relationship of services to Protocols, Reference models-OSI &TCP/IP, Network architectures introduction.	
Unit -II Physical and Data Link layer	**[7 hrs]**
Physical layer-Data rate limits, Transmission media, Switching systems, Datagram Switching & Virtual circuit switching, Structure of circuit and packet switch, cable modem and DSL technologies, SONET basics, Selection of IEEE std 802.1. Data link layer: Framing, Flow & Error control Protocols, Multiple access techniques random access, controlled access & Channelization Problems - Aloha, CSMA, ARQ.	
Unit -III Transport Layer, Network Layer and Application Layer	**[9 hrs]**
Transport layer: Process to process delivery, Connection oriented & Connectionless Transport, UDP, TCP, congestion control and Quality of Service. Network Layer: IPv4 address, IPv4, IPv6 address, Address mapping-ARP, RARP & DHCP, IPv4 datagram detail format, IPv6 datagram detail format, ICMP, IGMP, Network layer issues like Delivery, forwarding, intra-domain and Inter-domain routing. Application layer : Application layer protocols and applications like Ping, FTP, telnet, http (www), SMTP, SNMP, Trace route, TFTP, BOOTP, DNS, NFS, RPC, X-server, E-mail, Introduction to streaming Audio/Video,P2P file sharing	
UNIT- IV: Basics of Network Security and Network administration	**[4 hrs]**
Network security: Introduction to Cryptography, Secret key algorithm, public key algorithm, Secret key algorithm, public key algorithm, Basics of Security Requirements/Services/Dimensions. Network Administration: UTP Cabling for PC to PC communication, Network tester, network monitoring, Protocol Analyzer, Network Simulation, internet access through Dialup/DSL/Leased Line/Mobile handset.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Data Communications and Networking	Behrouz A. Forouzan	4th	Tata McGraw Hill
2	Computer Networks	Andrew Tenenbaum	4th	Pearson Education
3	Computer Networking- A top Down Approach	Kurose & Ross	3rd	Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	TCP/IP protocol Suit	Behrouz A. Forouzan	3rd	Tata McGraw Hill
2	TCP/IP illustrated Volume - I & II	Stevens		Pearson education.

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22ET561O	Open Elective - I Industrial Applications of Microcontrollers	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
1. The students' knowledge should get updated with the latest industrial trends in technology 2. The student can creatively use the capabilities of modern microcontrollers & latest technical advancements.	After completion of the course students are able to, 1. Explain the architecture of modern microcontrollers 2. Develop a circuit consisting of external elements connected to microcontroller I/O ports 3. Design the application by using embedded peripherals 4. Compare and choose the proper communication interface for the application to be designed 5. Outline the automation system for an application consisting of external elements

UNIT- I: Architecture and basic characteristics of microcontrollers	**[7 Hrs]**
Selection of microcontrollers, Architecture & Characteristics of Arduino, Introduction to ESP 32 & ARM based Microcontrollers. setting up the Arduino board, creating sketches, using Libraries, using example codes, Debugging Using the Serial Monitor & ICE (In-Circuit Emulator)	
Unit –II:- Input-output ports & Interface	**[8 Hrs]**
Architecture of the universal I/O ports subsystem (PIO) used in microcontrollers. Analog Inputs- Thermocouple, Strainguage, Microcontroller pin configuration programming. A/D converter (ADC) & D/A Converters(DAC) used in microcontrollers. Sensors: Temperature sensors, Humidity sensors, Proximity sensors, Ultrasonic sensor, Accelerometer, and gyro Casestudy of all faults diagnostic system for industrial encoders	
Unit –III:- Memory System ,Clock generator and timers/counters:	**[8 Hrs]**
Flash memory subsystem, EEPROM. Interrupts system, Architecture of timers/counters subsystem (TC) used in microcontrollers,Use of the TC subsystem to generate square waveforms of given parameters and measure frequency, duty factor, and time shift of waveforms. Pulse width Modulation (PWM). TC subsystem interrupts.**Case study of Power Harmonic Analyzer**	
UNIT- IV: Communication Interfaces:	**[8 Hrs]**
USART, I2C (TWI) and SPI standards, The architecture of USART, TWI and SPI controllers used in microcontrollers, Registersand software handling of above interfaces for Arduino, Handling of the interrupts generated by USART, TWI and SPI controllers.USB to TTL converter module.Examples on I2C(Interfacing RTC), SPI(Serial Eprom),Case study of Electronic Chlorophyll Reader	
Unit -V: Industrial Automation	**[6 Hrs]**
Basic block diagram, PLC & SCADA, Concepts of DCS, Process Boiler Automation, Machine control Automation, PLC and Microcontroller based instrumentation Systems, HMI display with touch screen, Modbus, PROFINET. Arduino Libraries for implementing MQTT & REST protocols for IoT.	

Text Books:

S.N	Title	Authors	Edition	Publisher
1	Arduino Cookbook	Michael Margolis	1	O'Reilly Media
2	Microcontrollers, Architecture,	Rajkamal	1	Pearson
3	Industrial Automation Using PLC	Rajesh Mehra, Vikrant	2	Paperback Bunko

Reference Books:

S.N	Title	Authors	Edition	Publisher
1	Microcontrollers			https://www.farnell.com/datasheets/1682209.pdf
2	UNO R3 Arduino			https://docs.arduino.cc/hardware/uno-rev3
3	Audrino			https://www.ti.com/microcontrollers-mcus-

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Chairman - BoS	Dean – Academics	Date of Release	Version	

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AS501T	Economics and Management	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
● The course examines how the economics, business and industrial management practices are related and how business decision is taken.	● Apply managerial economics concept in business analysis and business decision making. ● Explain relationships between production and costs and understand different forms of market structures. ● Asses impact of macroeconomics and government policies on business and economy. ● Recognize the functions of management and marketing management for business decisions. ● Explore role of financial management in business and decision making.

Unit I	**[8Hrs]**
Economics, Classification of economics, Industrial economics, Applications of Industrial economics. Types of Business structures, 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	**[8Hrs]**
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. Business cycles, optimum size of firm.	
Unit III	**[8Hrs]**
The functions of central bank, Inflation, Deflation, Recession. Measures to control Inflation, National income, GDP, GNP, Monetary and fiscal policy of government. Liberalization, Privatization and Globalization	
Unit IV	**[8Hrs]**
Definition of management, functions of management – planning, organizing, directing, Controlling, Introduction to human resources Management, Marketing Management, Concepts of Marketing, Marketing mix, Methods of pricing, Marketing mix. channels of distribution, advertising and sales promotion.	
Unit V	**[8Hrs]**
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, Principles of costing	

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
3.	Industrial Management	Dr.I.K. Chopde, Dr.A.M. Sheikh	Revised edition	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

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22AS502T	English for Engineers	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
To provide students with the skills and knowledge of communication in a business environment.	**At the end of the course, students will be able to:** 1. develop an understanding of basic grammar concepts and their applications. 2. prepare and equip themselves for competitive exams 3. deliver effective presentations in a professional environment, tackle group discussions and face interviews. 4. acquire hands-on experience in writing business letters 5. display written communication in line with different workplace requirements.

Unit I : Functional Grammar	**[6Hrs]**
1. Subject-Verb Agreement 2. Preposition, Pronoun and Articles 3. Tenses 4. Direct – Indirect Speech 5. Transformation of sentences – Simple, Complex, Compound and Degrees of comparison 6. Active and Passive Voice	
Unit II : English for Competitive Exams	**[5Hrs]**
1. Sentence improvement and construction 2. Paragraph ordering 3. One word substitution 4. Verbal Analogies 5. Idioms	
Unit III : Verbal Ability	**[4Hrs]**
1. Reading Comprehension 2. Listening to Conversation (formal and Informal) and Announcements. 3. Integrated Writing – Read, and listen to a short excerpt and write a response. 4. Speaking – Podcast, Group Discussion, Presentations and Mock Interviews	
Unit IV : Formal Correspondence	**[4Hrs]**
1. Describing, summarizing, comparing graphs or illustrations 2. Basic patterns of Business Letter Writing 3. Approaches to writing – Direct, Indirect and persuasive styles. 4. Cover letter, Resume, Applications.	
Unit V : Communication at Workplace	**[5Hrs]**
1. Drafting emails and reports 2. Circular and notices. 3. Meeting etiquette and recording Minutes of the Meeting 4. Writing a Press Release	

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Functional English for Technical Student	Dr. Pratibha Mahato and Dora Thompson	2020	Himalaya Publishing House
2.	Communication Skills for Engineer	C. Muralikrishna and Sunita Mishra	2022	Pearson
3.	Effective Technical Communication	Barun K Mitra	1	Oxford University Press
4.	Basic Business Communication	Lesikar, R. & Flately	9	Tata McGraw Hill

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FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
22H104	Foundational Humanities Elective- Development of Societies	2	-	-	-	Audit		

Course Objectives	Course Outcomes
This course will provide a natural link between engineering and humanities.	At the end of the course, students will be able to: 1. develop a larger view of social structures and systems. 2. understand the political systems and their comparative study. 3. Aware themselves of various economic systems and sustainable development. 4. understand the interaction of political and economic strategies. 5. apply learnt concepts and generate and evaluate models of development in current context.

Unit I Social Development	**[5Hrs]**
1. Concepts behind the origin of Family, Clan and Society 2. Different Social Systems 3. Relation between Human being and Society 4. Comparative studies on different models of Social Structures and their evolution	
Unit II Political Development	**[4Hrs]**
1. Ideas of Political Systems as learnt from History 2. Different models of Governing system and their comparative study	
Unit III Economic Development I	**[4Hrs]**
1. Birth of Capitalism, Socialism, Marxism	
Unit IV Economic Development II	**[7Hrs]**
1. Concept of development in pre-British, British and post British period- Barter, Jajmani 2. E. F. Schumacher's idea of development, Buddhist economics. Gandhian idea of development. Swaraj and Decentralization	
Unit V Economic Development III	**[4Hrs]**
1. Economic Development 2. Idea of development in current context.	

S.N	Title	Authors	Edition	Publisher
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