Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Microprocessors & Interfaces**	Course Code: **C022511(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT I: Introduction to Basic Microprocessors: Historical Background, the Harvard and Princeton architecture, The Microprocessor-Based Personal Computer Systems. The Microprocessor 8085, 8088 basics and comparison (Block & Pin diagram only).

UNIT II: Microprocessor Architecture 8086: 8086 basic block diagram, Internal Microprocessor Architecture, Real Mode Memory Addressing, Registers, pin configuration, segmentation. Data Movement Instructions: MOV, PUSH/POP, Load-Effective Address, String Data Transfers, Miscellaneous Data Transfer Instructions, Segment Override Prefix, Assembler Details. Arithmetic and Logic Instructions: Addition, Subtraction and Comparison, Multiplication and Division, BCD and ASCII Arithmetic, Basic Logic Instructions, Shift and Rotate, String Comparisons. Program Control Instructions: The Jump Group, Controlling the Flow of the Program, Procedures, and Introduction to Interrupts, Machine Control and Miscellaneous Instructions. Assembler directives, assembler instructions, Assembly Language Programming.

UNIT III: Assembly Language programming : Assembly Language programming with C/C++, Interrupt and Timing diagrams: Using Assembly Language with C/C++ for linking C/C++ into assembly language, Basic Programs – Use of BIOS and DOS Interrupts in assembly & C/C++, Interrupts of 8086 microprocessors, Timing diagram of 8086 microprocessor.

UNIT IV: Memory and I/O Interfacing: Minimum and Maximum mode configuration of 8086, Memory Interface with 8086 microprocessor, Address Decoding. Basic I/O Interface: Introduction to I/O Interface, I/O Port Address Decoding. I/O Interface using peripheral devices: The Programmable Peripheral Interface 8255, Programmable Interval Timer 8254. Direct Memory Access: Basic DMA Operation and Definition.

UNIT V: Advanced Microprocessors: 80386- Features, block diagram, data types, supported registers, memory system, real mode and protected mode operation, descriptors, cache register, control register, paging mechanism, virtual mode, and protection mechanism for operating system. Comparative Study of Modern Microprocessor (Web based Reference for study): Pentium Pro (Pentium II, Pentium III, Pentium IV), Core i3,i5,i7 and Atom processors.

Text Books:

1. Barry B Brey: The Intel Microprocessors, 8th Edition, Pearson Education, 2009. (Listed topics only from the Chapters 1 to 13)
2. Ramesh S. Gaonkar : Microprocessor Architecture, programming and Application with 8085, 4th Edition, Wiley,2012

Reference Books:

1. Douglas V. Hall: Microprocessors and Interfacing, Revised 2nd Edition, TMH, 2006.
2. James L. Antonakos: The Intel Microprocessor Family: Hardware and Software Principles and Applications, Cengage Learning, 2007.
3. Nilesh B. Bahadure: Microprocessors: The 8086/8088, 80186/80286, 80386/80486 and the Pentium family, 2nd edition (2014), Prentice Hall of India (PHI).
4. K. Udaya Kumar & B.S. Uma Shankar: Advanced Microprocessors & IBM-PC Assembly Language Programming, TMH 2003.
5. Microprocessor: Theory and Applications- Intel and Motorolla, Rafiquuzzaman, PHI.

Course Outcomes [After undergoing the course, students will be able to:]

1. Apply basic concepts of digital fundamentals to Microprocessor based personal computer system.
2. Identify a detailed software& hardware structure of the Microprocessors.
3. Design, write and test assembly language programs of moderate complexity.
4. Illustrate how the different peripherals are interfaced with Microprocessor
5. Apply concepts of microprocessor for developing system to solve real world problems.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Computer Networks**	Course Code: **C022512(022)**
Total / Minimum-Pass Marks (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction: OSI, TCP/IP and other networks models, Network Topologies WAN, LAN, MAN. Transmission media copper, twisted pair wireless, switching and Multiplexing and De-multiplexing, Networking Devices.

UNIT-II Data link layer: Framing, Error detection and correction, Flow Control. Multiple Access Protocols – Data Link Layer Addressing, ARP, RARP, DHCP, Ethernet standards. Media Access Control Protocols. MAC addresses. Wireless LANS. High Level Data Link Control, Asynchronous Transfer Mode.

UNIT- III Network Layer: Internet Protocol (IP), IPv4 and IPv6, Sub-netting and Super-netting, ICMP, Unicast Routing Protocols: Link State Routing, Distance Vector Routing, Hierarchical Routing, RIP, OSPF, BGP Multicast Routing, Multicast Routing Protocols: DVMRP, MOSPF, CBT, PIM, MBONE, Mobile IP, IPsec.

UNIT-IV Transport Layer: Transport Layer Services Connectionless Protocols: UDP, UDP segment, Reliable Data Transfer. Connection-Oriented Protocols: TCP Segment Structure, RTT estimation, Flow Control, Connection Management, Congestion Control, Integrated and Differentiated Services: Intserv – Diffserv.

UNIT-V Application Layer: Principles of Network Applications, The Web and HTTP, FTP, Electronic Mail, SMTP, Mail Message Formats and MIME, DNS, Socket Programming with TCP and UDP. Multimedia Networking: Internet Telephony, RTP, RTCP, RTSP. Network Security: Principles of Cryptography, Firewalls, Attacks and Countermeasures.

Text Books:

1. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.
2. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, Third edition, 2006

Reference Books:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson.

Course Outcomes[After undergoing the course, students will be able to:]

1. On completion of this unit the student should be able to:
2. Understand the basic structure of an abstract layered Network protocol model for any Networking environment
3. Identify and apply basic theorems and formulae for the information-theoretic basis of communication and the performance of TCP/IP network protocols.
4. Acquire reflective practice necessary to support a career in Computer Networking at advanced professional level.
5. Understand different protocols, software, and network architectures, their topologies, protocols in any networking application domains.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Formal Languages and Automata Theory**	Course Code: **C022513(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I The Theory Of Automata: Introduction to automata theory, Examples of automata machine, Finite automata as a language acceptor and translator, Deterministic finite automata. Non-deterministic finite automata, finite automata with output (Mealy Machine. Moore machine), Finite automata with ε moves, Minimizing number of states of a DFA, My hill Nerode theorem, Properties and limitation of FSM, Application of finite automata.

UNIT-II Regular Expressions: Alphabet, String and Languages, Regular expression, Properties of Regular Expression, Finite automata and Regular expressions, Arden's Theorem, Regular Expression to DFA conversion & vice versa. Pumping lemma for regular sets, Application of pumping lemma, Regular sets and Regular grammar, Closure properties of regular sets. Decision algorithm for regular sets and regular grammar.

UNIT- III Grammars: Definition and types of grammar, Chomsky hierarchy of grammar, Relation between types of grammars, Context free grammar, Left most & right most derivation trees, Ambiguity in grammar, Simplification of context free grammar, Chomsky Normal From, Greibach Normal From, properties of context free language, Pumping lemma for context free language, Decision algorithm for context tree language.

UNIT-IV Push Down Automata And Turing Machine: Basic definitions, Deterministic push down automata and non-deterministic push down automata, Acceptance of push down automata, Push down automata and context free language, Turing machine model, Representation of Turing Machine, Construction of Turing Machine for simple problem's, Universal Turing machine and other modifications .Church's Hypothesis, , Halting problem of Turing Machine.

UNIT-V Computability: Introduction and Basic concepts, Recursive function, Partial recursive function, Initial functions, Composition of functions, Ackerman's function, Recursively Enumerable and Recursive languages, Decidable and undecidable problem, Post correspondence problem, Space and time complexity.

Text books:

1. Theory of Computer Science (Automata Language & Computation), K.L.P. Mishra and N. Chandrasekran, PHI.
2. Introduction to Automata theory. Language and Computation, John E. Hopcropt & Jeffery D. Ullman, Narosa, Publishing House.

References books:

1. John Martin, "Introduction to Languages and the Theory of Computation", Tata McGraw Hill.
2. Kamala Krithivasan, Rama R., "Introduction to Formal Languages Automata Theory and Computation", 2nd Edition, Pearson Education.

Course Outcomes [After undergoing the course, students will be able to:]

1. Design finite automata to accept a set of strings of a language.
2. Determine whether the given language is regular or not.
3. Design context free grammars to generate strings of context free language.
4. Design push down automata and the equivalent context free grammars and Design Turing machine.
5. Distinguish between computability and non-computability, Decidability and un-decidability.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Data Analytics with PYTHON**	Course Code: **C022514(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction: Key Concepts: Python Identifiers, Keywords, Indentations, Comments in Python, Operators, Membership operator, String, Tuple, List, Set, Dictionary, File input/output.

UNIT-II An Introduction to Data Analysis: Knowledge Domains of the Data Analyst, Understanding the Nature of the Data, The Data Analysis Process, Quantitative and Qualitative Data Analysis

UNIT- III The NumPy Library: Ndarray, Basic Operations, Indexing, Slicing, and Iterating, Conditions and Boolean Arrays, Shape Manipulation, Array Manipulation, Vectorization, Broadcasting, Structured Arrays, Reading and Writing Array Data on Files.

UNIT-IV The pandas Library: The Series, The DataFrame, The Index Objects, Reindexing, Dropping, Arithmetic and Data Alignment, Operations between DataFrame and Series, Functions by Element, Functions by Row or Column, Statistics Functions, Sorting and Ranking, Correlation and Covariance, "Not a Number" Data. Reading and Writing Data: CSV and Textual Files, HTML Files, XML, Microsoft Excel Files.

UNIT-V Data Visualization with matplotlib: A Simple Interactive Chart, Set the Properties of the Plot, matplotlib and NumPy, Working with Multiple Figures and Axes, Adding Text, Adding a Grid, Adding a Legend, Saving the Charts. Line Chart, Histogram, Bar Chart, Pie Charts.

Text Books:

1. Python Data Analytics– Fabio Nelli, APress.
2. Python for Data Analysis, Wes McKinney, O'Reilly.

Reference Books:

1. Mastering Machine Learning with Python in Six Steps, Manohar Swamynathan, APress
2. Data Structures and Algorithms Using Python, Rance D. Necaise, WILEY

Course Outcomes [After undergoing the course, students will be able to:]

1. Use various data structures available in Python.
2. Apply the concepts of Data Analysis.
3. Apply the use of Numpy Library for performing various data processing activities.
4. Apply the use of Pandas library for data handling activities.
5. Apply the use of Matplotlib for data visualization activities.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Computer Graphics (Professional Elective – I)**	Course Code: **C022531(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 0 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction to computer graphics & graphics systems
Overview of computer graphics, storage tube graphics display, Raster scan display. Points & lines, Line drawing algorithms, DDA algorithm, Bresenham's line algorithm, Circle generation algorithm, Ellipse generating algorithm, scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

UNIT-II Two-Dimensional and Three-dimensional Transformations: Transformations and Matrices, Transformation Conventions, 2D & 3D Transformations, Homogeneous Coordinates and Matrix Representation of 2D & 3D Transformations, Translations and Homogeneous Coordinates, Rotation, Reflection, Scaling, 3DShearing, Combined 2D & 3D Transformation, Transformation of Points, Transformation of The Unit Square, Solid Body Transformations, Rotation About an Arbitrary Point / Plane, Reflection through an Arbitrary Line, A Geometric Interpretation of Homogeneous Coordinates, Window-to-Viewport Transformations.

UNIT- III Clipping: Types and Algorithms, Cohen-Sutherland, Cyrus-beck line clipping, Sutherland-Hodgeman polygon clipping algorithm;
Visible-Surface Determination: Techniques for efficient Visible-Surface Algorithms, Categories of algorithms, Back face removal, The z-Buffer Algorithm, Scan-line method, Painter's algorithms (depth sorting), Area sub-division method, BSP trees, Visible-Surface Ray Tracing, comparison of the methods.

UNIT-IV Plane Curves and Surfaces: Curve Representation, Nonparametric Curves, Parametric Curves, Parametric Representation of a Circle, Parametric Representation of an Ellipse, Parametric Representation of a Parabola, Parametric Representation of a Hyperbola, Representation of Space Curves, Cubic Splines, Bezier Curves, Bspline Curves, B-spline Curve Fit, B-spline Curve Subdivision, Parametric Cubic Curves, Quadric Surfaces. Bezier Surfaces.

UNIT-V Animations & Realism 10 Animation Graphics: Design of Animation sequences – animation function – raster animation – key frame systems – motion specification –morphing – tweening, Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing.

Text Books:

1. Computer Graphics – Principles and Practice by J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes 2nd edition, Pearson
2. Fundamentals of Computer Graphics by S. Marschner, P. Shirley, 4th Edition, CRC Press.

Reference Books :

1. Computer Graphics: H. Baker, 2nd Edition, Pearson.
2. Principles of Interactive Computer Graphicsby W.M. Newman & R. F. Sproull, Peterson, 2nd Edition, TMH.

Course Outcomes [After undergoing the course, students will be able to:]
1. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
2. Use of geometric transformations on graphics objects and their application in composite form.
3. Extract scene with different clipping and transformation methods; also exploring projections and visible surface detection techniques for display of 3D scene on 2D screen.
4. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
5. Design simple applications using principles of virtual reality.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Object Oriented Analysis & Design (Professional Elective – I)**	Course Code: **C022532(022)**
Total / Minimum-Pass Marks (End Semester Exam): **100 / 35**	L: 2 T: 0 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Introduction:Modelling Concepts and Class Modelling: What is Object 8 Hours orientation? What is OO development? OO Themes; Evidence for usefulness of OO development; OO modelling history. Modelling as Design technique: Modelling; abstraction; The Three models. Class Modelling: Object and Class Concept; Link and associations concepts; Generalization and Inheritance; A sample class model; Navigation of class models; Advanced Class Modelling, Advanced object and class concepts; Association ends; N-ary associations; Aggregation; Abstract classes; Multiple inheritance; Metadata; Reification; Constraints; Derived Data; Packages.

UNIT-II UseCase Modelling and Detailed Requirements: Overview; Detailed object- 8 Hours oriented Requirements definitions; System Processes-A use case/Scenario view; Identifying Input and outputs-The System sequence diagram; Identifying Object Behaviour-The state chart Diagram; Integrated Object-oriented Models.

UNIT- III Process Overview: System Conception and Domain Analysis: Process Overview: 8 Hours Development stages; Development life Cycle; System Conception: Devising a system concept; elaborating a concept; preparing a problem statement. Domain Analysis: Overview of analysis; Domain Class model: Domain state model; Domain interaction model; Iterating the analysis.

UNIT-IV System design and Class Design: System design: Overview of System Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Subsystems, Identifying Concurrency, Allocating Subsystems, Management of Data Storage, Handling Global Resources, Choosing Software Control Implementation, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Styles, Architecture of the ATM System. Class design: Overview of Object Design, Bridging the gap, Realizing Use Cases, Designing Algorithms, Recursing Downward, Refactoring, Design Optimization, Reification of Behavior, Adjustment of Inheritance, Organizing a Class Design, ATM Example.

UNIT-V Design Patterns: Introduction; what is a design pattern?, Describing design patterns, the catalogue of design patterns, Organizing the catalogue, How design patterns solve design problems, how to select a design patterns, how to use a design pattern; Creational patterns.

Text Books:

1. Object – Oriented Modeling and Design with UML, Michael R Blaha and James R Rumbaugh, 2nd Edition, Pearson Education, India.
2. Object oriented systems development, Ali Bahrami, McGraw-Hill Higher Education, 1999.

Reference Books:

1. Object Oriented Analysis & Design, Atul Kahate, Tata McGraw-Hill Education
2. Object-Oriented Analysis and Design with Applications, Third Edition, Grady Booch, Robert A. Maksimchuk Michael W. Engle, Bobbi J., Young, Ph.D., Jim Conallen, Kelli A. Houston.

Course Outcomes [After undergoing the course, students will be able to:]

1. Describe the concepts involved in Object-Oriented modelling and their benefits
2. Demonstrate concept of use-case model, sequence model and state chart model for a given problem.
3. Explain the facets of the unified process approach to design and build a Software system.
4. Translate the requirements into implementation for Object Oriented design.
5. Choose an appropriate design pattern to facilitate development procedure.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Digital Image Processing (Professional Elective – I)**	Course Code: **C022533(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 0 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT I: Introduction: Fundamental Steps in Digital Image Processing, Components of an Image Processing System, Image formation model, Image Acquisition , Image Sampling and Quantization , Spatial & Gray level resolution, Basic Relationships Between Pixels.

UNIT II: Image Enhancement & Restoration: Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters smoothing and sharpening, Image Restoration and Reconstruction

UNIT III: Morphological Image Processing & Image segmentation: Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction. Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

UNIT IV: : Image Descriptor & Classification: Image Descriptors, Boundary descriptors, Shape numbers, Texture, Feature Extraction, Image Pattern Classification, Neural Networks and Deep Learning

UNIT V Image compression: Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

Text Books:

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP ltd,

Reference Books :

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

Course Outcomes [After undergoing the course, students will be able to:]

1. Describe, analyze and reason as to how digital images are represented, manipulated and get encoded.
2. Understand the processing of images with emphasis on algorithm design, implementation and performance evaluation.
3. Apply principles and techniques of digital image processing in applications related to digital imaging system design and analysis.
4. Analyze and implement image-processing algorithms.
5. Extract features for image description and apply neural network and deep learning forclassification.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Multimedia & Virtual Reality (Professional Elective – I)**	Course Code: **C022534(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 0 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

UNIT- I Theory of Internet:-Introduction, Evolution of Internet, Internet applications, Internet Protocol: TCP/IP, Protocol, Versions, Class full addressing, IP data gram, ICMP &IGMP. Functions of ARP and RARP ,User Data gram Protocol(UDP),Transmission Control Protocol(TCP):Flow-Control, Error-Control. Internet Security& Firewalls.

UNIT-II Bounded Media for Internet: Cable media,Telephone network, ISDN: Overview, Interfaces& Functions, Physical Layer, Data Link Layer, Network Layer Services ,Signaling System Number7.ATM& B-ISDN: Introduction Services& Applications, Principles& building blocks of B-ISDN, DIAS network.

UNIT- III Un-Bounded Media for Internet: Wireless media: Components and working of Wireless network, IEEE 802.11standardsandWLANtypes, Ad-hoc networks, MACAW Protocol. Features and Goals of Bluetooth, Bluetooth products and security, TCP OverWireless&Ipv6:Mobile IP ,support of Mobility on the Internet, Mobile TCP, Traffic Routing in Wireless Networks, Circuit switched DataServices,Packet switched Dataservices. WLL Architecture, WLL Technologiesand frequency spectrum, Local Multipoint Distribution Service(LMDS), Ultra Wideband Technology.

UNIT-IV Introduction to Multimedia:-Concept of Non-Temporal and Temporal Media. Hypertex tand Hypermedia.Presentations:Synchronization,Events, Scriptsand Interactivity,CompressionTechniques: Basic conceptsof Compression. StillImageCompression:JPEG Compression., FeaturesofJPEG2000.Video Compression:MPEG-1&2 CompressionSchemes,MPEG-4 NaturalVideoCompression.Audio Compression: IntroductiontospeechandAudio Compression,MP3Compression Scheme. Compression ofsynthetic graphical objects.

UNIT-V MultimediaSystemsTechnology: ArchitectureforMultimediaSupport:MultimediaPC/Workstation Architecture,CharacteristicsofMMXinstructionset, I/Osystems:IEEE 1394 interface,OperatingSystemSupport forMultimediaData: ResourceSchedulingwith realtimeconsiderations,FileSystem,I/O DeviceManagement. MultimediaInformationManagement:MultimediaDatabaseDesign, Content Based InformationRetrieval:Image Retrieval, VideoRetrieval, OverviewofMPEG-7,Design ofVideo-on-demand systems.

Text Books:

1. Multimedia System Design, Andleigh and Thakarar , PHI, 2003.
2. Multimedia Technology & Application, David Hillman, Galgotia Publications.

Reference Books :

1. Multimedia Computing Communication and Application, Steinmetz, Pearson Edn.
2. Virtual Reality Systems, John Vince, Pearson Education.
3. Fundamentals of Computer Graphics and Multimedia, D.P. Mukherjee, PHI

Course Outcomes [After undergoing the course, students will be able to:]

1. Know the fundamental video, audio, image, text processing techniques
2. Acquire the basic skill of designing video compression, audio compression, image compression, text compression.
3. Know the basic techniques in designing video transmission systems: error control and rate control.
4. Know the technologies related to virtual reality and application of virtual reality system.
5. Get familiar with VRML programming.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Microprocessors & Interfaces (Laboratory)**	Course Code: **C022521(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. To perform addition & subtraction of two 8 – bit hexadecimal numbers.
2. To perform addition & subtraction 16 – bit hexadecimal numbers.
3. To perform addition & subtraction 32 – bit hexadecimal numbers.
4. To perform addition & subtraction of two 8 – bit decimal numbers and store the result in DX register.
5. To perform addition & subtraction of two decimal digits 9 and 7 using ASCII code store the result in ASCII format.
6. To perform addition & subtraction of two decimal digits 97 and 25 using ASCII code store the result in ASCII format in CX-BX register.
7. To perform multiplication of 4 and 5 .
8. To perform division of 16 – bit number with 8-bit number.
9. To perform multiplication of two 8-bit numbers using ASCII code store the result in ASCII form in DX register.
10. To perform division of two 8-bit numbers using ASCII code store the result in ASCII form in DX register.
11. To solve Arithmetic equation 3AX+5DX+BP and store the result in CX register.
12. To solve Arithmetic equation (P*Q)+(R*S).
13. To add only positive number from 100 data bytes.
14. To write a program to add series of 20 bytes.
15. To find positive & negative byte from 100 data bytes.
16. To find largest & smallest byte from block of data.

Laboratory Equipment / Machine Requirements: 8086 based microprocessor kit, MASM assembler, 8086 simulator, PCs.
The students are free to choose any programming platform from (C++ / JAVA / PYTHON) to perform the above-mentioned set of laboratory experiments.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
2. Identify a detailed s/w & h/w structure of the Microprocessor
3. Design, write and test assembly language programs of moderate complexity.
4. Illustrate how the different peripherals are interfaced with Microprocessor
5. Apply concepts of microprocessor for developing system to solve real world problems.

Recommended Books:

1. IBM PC Assembly Language and Programming, P. Abel, 5th Edition, PHI/Pearson Education.
2. Introduction To Assembly Language Programming, SivaramaP.Dandamudi, Springer Int. Edition,2003.
3. The 8088 and 8086 Microprocessors: Programming , Interfacing,Software,Hardware and Application,4th edition, W.A. Triebel, A.Singh,N.K.Srinath,Pearson Education

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Computer Networks Laboratory**	Course Code: **C022522(022)**
T**otal / Minimum-Pass Marks**(End Semester Exam):**40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Introduction to Local Area Network with its cables, connectors and topologies.
2. Installation of UTP, Co-axial cable, Cross cable, parallel cable NIC and LAN card.
3. To connect two Personal Computer with UTP cable.
4. Installation of Switch. their cascading and network mapping.
5. Case Study of Ethernet (10 base 5,10 base 2,10 base T)
6. Installation and working with Telnet (Terminal Network).
7. Installation and working with FTP (File Transfer Protocol).
8. Installation and basic operation of a packet sniffer wireshark.
9. Installation of Modem and Proxy Server.
10. Simulation of LAN protocol using NETSIM/Packet Tracer/Lan Trainer Kit.
11. Introduction to Server administration.
12. Installation of Windows 2003 server/ Windows 2000 server.
13. Configuration of DHCP.
14. Configuring Switch/Router.
15. Installation and working of Net meeting and Remote Desktop.

List of Equipment / Machine Required:

Windows 2003 server/Windows 2000 server. . NETSIM, WIRESHARK, cisco packet tracer, LAN Trainer Kit LAN Card Cable, WIRE CUTTER , Connectors, Switch, Crimping Tools.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Design LAN
2. Configure Windows 2003 /2000/DHCP, Proxy Server.
3. Configure L2/L3 Switches.
4. Install netsim and simulate various LAN Protocols.
5. Install wireshark and Analyze network data using it.

Recommended Books.

1. Computer Network and internet by Dougles E. Comer (Pearson Education)
2. List of Software required :-
3. Windows 2003 server/Windows 2000 server.
4. List of Hardware required :-
5. LAN Trainer Kit LAN Card Cable, Connectors, HUB, Switch, Crimping Tools.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Data Analytics with PYTHON Laboratory**	Course Code: **C022523(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: *(E**ach student should perform, at least, 10 experiments.)***

1. Write programs to understand the use of Python Identifiers, Keywords, Indentations, Comments in Python, Operators, Membership operator.
2. Write programs to understand the use of Python String, Tuple, List, Set, Dictionary, File input/output.
3. Write programs to understand the use of Numpy's Ndarray, Basic Operations, Indexing, Slicing, and Iterating, Conditions and Boolean Arrays.
4. Write programs to understand the use of Numpy's Shape Manipulation, Array Manipulation, Vectorization.
5. Write programs to understand the use of Numpy's Structured Arrays, Reading and Writing Array Data on Files.
6. Write programs to understand the use of Pandas Series, DataFrame, Index Objects, Reindexing, Dropping, Arithmetic and Data Alignment.
7. Write programs to understand the use of Pandas Functions by Element, Functions by Row or Column, Statistics Functions, Sorting and Ranking, Correlation and Covariance, "Not a Number" Data.
8. Write programs to understand the use of Pandas for Reading and Writing Data using CSV and Textual Files, HTML Files, XML, Microsoft Excel Files.
9. Write programs to understand the use of Matplotlib for Simple Interactive Chart, Set the Properties of the Plot, matplotlib and NumPy.
10. Write programs to understand the use of Matplotlib for Working with Multiple Figures and Axes, Adding Text, Adding a Grid, Adding a Legend, Saving the Charts.
11. Write programs to understand the use of Matplotlib for Working with Line Chart, Histogram, Bar Chart, Pie Charts.

Recommended Books:

1. Python Data Analytics– Fabio Nelli, APress.
2. Python for Data Analysis, Wes McKinney, O'Reilly.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Use various data structures available in Python.
2. Apply the concepts of Data Analysis.
3. Apply the use of Numpy Library for performing various data processing activities.
4. Apply the use of Pandas library for data handling activities.
5. Apply the use of Matplotlib for data visualization activities.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **PROJECT-I Laboratory**	Course Code: **C022524(022)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Each student has to undergo Project I using any language platform based on Summer Internship and / or Industrial Training)

Guidelines for Pursual / Assessment of Project I Laboratory:

1. Students are encouraged to pursue live / research based / survey based / case study based projects under this Laboratory post summer internship or Industrial Training period;
2. Students are encouraged to make teams of maximum FOUR to work under a single project title;
3. Students are initially advised to get approval of their project titles and mentorship consent under any faculty from own discipline and training supervisor in the prescribed format provided;
4. Student groups can be of inter-disciplinary nature;
5. Students are required to submit weekly progress report with due approval signature(s) of their project mentors till the completion of that project;
6. At the end, the students must submit the project reports with due signature(s) of project mentor (in-house Teaching Faculty from relevant discipline) and training supervisor (representing the organization of training) in the following format.

Vocational / Industrial Training Report Format

Cover Page (1 page)
Inner Pages (3 pages)
Certificate by Company/Industry/Institute
Declaration by student

About Company/Industry/Institute (1 page)
Table of Contents (1 page)
List of Tables (1 page)
List of Figures(1 page)
Abbreviations and Nomenclature (If any)
Chapters (1-2 page each)
Introduction to Project
Tools & Technology Used
Snapshots
Task Deliverables / Project Outcome
Conclusions and Future Scope
Bibliography / Webliography / References (1page)
Weekly Progress Sheets (4 pages)
Feedback Report by Company/Industry/Institute (1 page)

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (V)**	Branch: **Computer Science &Engineering**
Subject: **Environmental Studies**	Course Code: **C000506(020)**
Total Marks (Internal Assessment): 10	L: 0 T:0 P: 2 Credit(s): 0
Internal Assessments to be conducted: 02	Duration (End Semester Exam): **NA**

PREREQUISITE: Knowledge of basic Chemistry, Physics and Mathematics.

COURSE OBJECTIVES:

1. Basic knowledge of environment, ecology, ecosystems, biodiversity and conservation.
2. Fundamentals of natural resources, control, uses and its impact on environment.
3. Human population, growth, growing needs and its impact on society and environment.
4. Types of environmental pollution, legislations, enactment and management.

UNIT I: Introduction to environmental studies, ecology and ecosystems (06 hours)

Introduction to environment; Concept and structure of ecology and ecosystem, energy flow; Community ecology; Food chains and webs; Ecological succession; Characteristic features of forest, grassland, desert and aquatic ecosystem; Multidisciplinary nature of environmental studies, scope and importance; Concept of sustainability and sustainable development.

UNIT II: Biodiversity and conservation (06 hours)

Introduction to biological diversity and levels of genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots; Threats to biodiversity, habitat loss, conflicts and biological invasions; In-situ and Ex-situ conservation of biodiversity: Ecosystem and biodiversity services.

UNIT III: Natural resources and environment (08 hours)

Concept of Renewable and non-renewable resources; Land resources, land use change, land degradation, soil erosion; Desertification; Deforestation: causes, consequences and remedial measures; Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state); Energy resources: environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.

UNIT IV: Human communities, social issues and environment (08 hours)

Basic concept of human population, growth and communities; Impacts on environment, human health, welfare and human rights; Resettlement and rehabilitation; Environmental natural disaster: floods, earthquake, cyclones, tsunami and landslides; Manmade disaster; Environmental movements; Environmental ethics: role of gender and cultures in environmental conservation; Environmental education and public awareness; Human health risks and preventive measurements.

UNIT V: Environmental pollution, policies, legislations, assessment and practices (12 hours)

Environmental pollution: Causes, effects and controls of air, water, soil, noise and marine pollution; Concept of hazardous and non-hazardous wastes, biomedical and e-wastes; Solid waste management and control measures; Climate change, global warming, ozone layer depletion, acid rain and their societal impacts; Environment laws: Wildlife Protection Act, Forest Conservation Act, Water (Prevention and control of Pollution) Act, Air (Prevention & Control of Pollution) Act, Environment Protection Act, Biodiversity Act, International agreements negotiations, protocols and practices; EIA, EMP.

On completion of each unit, students have to submit one assignment from each unit.

COURSE OUTCOMES (CO) [On completion of the course, students will able to:]

1. Interpret and demonstrate the concept of ecology and ecosystem for environmental sustainability.
2. Define and establish the diversified knowledge of biodiversity and its conservation.
3. Explain the uses of natural resources efficiently and its impact on environment.
4. Illustrate and solve the simple and complex social issues relating to human communities.
5. Exemplify and make useful solution to combat the environmental degradation with the aid of national and international legislations and protocols there under.
6. Demonstrate and elucidate the complicated issues and anthropological problems for societal development.
7.

TEXT BOOKS:

1. De, A.K., (2006).*Environmental Chemistry*, 6th Edition, New Age International, New Delhi.
2. Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.
3. Asthana, D. K. (2006).*Text Book of Environmental Studies*. S. Chand Publishing.

REFERENCE BOOKS:

1. Odum, E. P., Odum, H. T., & Andrews, J. (1971).*Fundamentals of ecology*. Philadelphia: Saunders.
2. Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India.
3. Sharma, P. D., & Sharma, P. D. (2005).*Ecology and Environment*. Rastogi Publications.

OPEN SOURCE LEARNING: http://nptel.ac.in/