

**BACHELORS WITH HEALTH AND WELLNESS AS VALUE ADDED COURSE**  
**1<sup>st</sup> to 2<sup>nd</sup> SEMESTERS**  
**HYS024V HEALTH AND WELLNESS**

**CREDITS: 02**

***COURSE OBJECTIVES:***

- *To help understand the importance of a healthy lifestyle*
- *To familiarize students about physical and mental health*
- *To create awareness of various life style related diseases*
- *To provide understanding of stress management*

**UNIT I. INTRODUCTION TO HEALTH & WELLNESS (15 lectures)**

Define and differentiate health and wellness. Importance of health and wellness Education. Historical background of yoga and its relevance in contemporary world. Need and importance of yoga. Asanas and meditation for healthy well-being. Prenatal yoga for women well-being. Yoga and stress management. Diet and nutrition for health & wellness. Essential components of balanced diet for healthy living with specific reference to the role of carbohydrates, proteins, fats, vitamins & minerals. Processed foods and unhealthy eating habits. Identification of suicidal tendencies. Substance abuse (Drugs, Cigarette, Alcohol), de-addiction, counselling and rehabilitation.

**UNIT II. MANAGEMENT OF HEALTH AND WELLNESS. (15 lectures)**

Healthy foods for prevention of life-threatening diseases with special reference to cancer, Hypertension, Diabetes and Cardiovascular diseases. Physical Fitness and components of Physical Fitness. Advantages of Good Physique. Active and sedentary lifestyles and its implications. Postural deformities and its corrective measures. Psychological wellbeing and its importance in the field of Sports. Role of sleep in maintenance of physical and mental health.

**SUGGESTED BOOKS:**

- Physical Activity and Health by Claude Bouchard, Steven N. Blair, William L. Haskell.
- Mental Health Workbook by Emily Attached & Marzia Fernandez, 2021.
- Mental Health Workbook for Women: Exercises to Transform Negative Thoughts and Improve Well-Being by Nashay Lorick, 2022.
- Lifestyle Diseases: Lifestyle Disease Management, by C. Nyambichu & Jeff Lumiri, 2018.
- Physical Activity and Mental Health by Angela Clow & Sarah Edmunds, 2013.

**FYUGP CURRICULAR FRAMEWORK FOR BACHELORS PROGRAMME WITH  
APPLIED COMPUTING AS MINOR-2024**

*(OPTIONAL FOR STUDENTS WITH COMPUTER APPLICATION / INFORMATION TECHNOLOGY AS MAJOR)*

SEMESTER	COURSE CODE	TYPE OF COURSE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL / TUTORIAL
<b>I</b>	<b>ACP124N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: DIGITAL ELECTRONICS</b>	<b>4</b>	<b>2</b>
<b>II</b>	<b>ACP222N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: WEB DESIGNING</b>	<b>4</b>	<b>2</b>
<b>III</b>	<b>ACP323N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: CRYPTOGRAPHY AND NETWORK SECURITY</b>	<b>4</b>	<b>2</b>
<b>IV</b>	<b>ACP422N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: IOT FUNDAMENTALS</b>	<b>3</b>	<b>1</b>
<b>V</b>	<b>ACP522N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: THEORY OF COMPUTATION</b>	<b>3</b>	<b>1</b>
<b>VI</b>	<b>ACP622N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: ARTIFICIAL INTELLIGENCE</b>	<b>3</b>	<b>1</b>
<b>VII</b>	<b>ACP722N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: DESIGN AND ANALYSIS OF ALGORITHMS</b>	<b>3</b>	<b>1</b>
<b>VIII</b>	<b>ACP822N</b>	<b>CT-1</b>	<b>APPLIED COMPUTING: CLOUD COMPUTING (HONOURS)/ LATEX (RESEARCH)</b>	<b>3</b>	<b>1</b>

**HEAD OF THE DEPARTMENT / CONVENOR BOUGS**

**BACHELORS WITH APPLIED COMPUTING AS MINOR**  
(FOR STUDENTS WITH MAJOR IN COMPUTER APPLICATIONS / INFORMATION TECHNOLOGY)

**1<sup>st</sup> SEMESTER**

**ACP124N APPLIED COMPUTING \_ DIGITAL ELECTRONICS**

**CREDITS: THEORY: 4; PRACTICAL: 2**

**COURSE LEARNING OUTCOMES:**

- *To introduce concepts of number systems and Boolean algebra.*
- *To familiarize students with the operation and use of basic digital logic gates as well as the design and minimization of combinational logic circuits.*
- *To introduce the concept of microprocessors and familiarize them with basic operation of a CPU.*

**THEORY (4 CREDITS)**

**UNIT 1:**

Introduction to Digital and Analog Quantities, Binary Digits, Logic Levels, Pulse, Waveforms, Clock and Timing Diagrams (1 Hour)

Number Systems - Decimal, Binary, Octal, Hexadecimal and their Conversions. (4 Hours)

Unsigned Binary Arithmetic, Ones Complement, Twos Complement. Signed Numbers and their arithmetic. Binary Coded Decimal. Error Codes-Parity Code (4 Hours)

Logic Gates—AND, OR, NOT, NAND, NOR, XOR and XNOR Gates. (2 Hours)

Boolean Algebra: Boolean Operations, Laws and Rules of Boolean Algebra, DeMorgan's Theorems. Constructing a Boolean Expression for a Logic Circuit, Logic Simplification. (5 Hours)

**UNIT 2:**

SOP and POS forms, Karnaugh Maps and minimization upto 4 variables, Don't care conditions (4 Hours) Combinational Logic Circuits: AND-OR, AND-OR-INVERT, XOR and XNOR logic, Converting Boolean Expression or Truth Table to a Logic Circuit, NAND and NOR as Universal Gates (4 Hours)

Half Adder, Full Adder, 4-bit Parallel Binary Adder, Comparator, Binary Decoder, Encoder, Multiplexer, Demultiplexer (7 Hours)

**UNIT 3:**

Latches: SR Latch, D Latch, Gated SR and D Latch (2 Hours) Flip Flops: Difference between Flip Flop and Latch, Level vs Edge-Triggered. D Flip Flops, JK Flip Flops and their operation (4 Hours)

Characteristics and Applications of Flip Flops (storage, counting), Intro to 555 Timer (2 Hours)

Shift Registers - Serial and Parallel (4-bit) (3 Hours) Counters: Synchronous and Asynchronous (2/3 bit). Decade Counter, Johnson counter (4 Hours)

**UNIT 4:**

von Neumann Architecture: Block Diagram, CPU, Memory, I/O Ports and Buses, Bus Master, Bus Contention: Shared Signal Lines and Tri-State Outputs, Fan-out, Buffers, Device Selection, System Timing.

Microprocessor, ALU, Control/Timing Unit, Decode Unit, Register Set, Instruction Execution Cycle. Memory: Memory Bus, Read / Write operations and Addressing Modes. I/O: Polling, Interrupts and DMA. Intro to Types of CPU Instructions.

Microcontrollers: Architecture, Registers, Functional Units and Peripherals. System on Chip (SoC): Block Diagram, Functional Elements, Difference between Microprocessor, Microcontroller and SoC. (15 Hours)

**TEXTBOOK:**

1. Thomas Floyd, Digital Fundamentals, 11th Edition (2015), Pearson.

**REFERENCES:**

1. Morris Mano, Michael Ciletti, Digital Design with an Introduction to the Verilog HDL, VHDL, and SystemVerilog, 6<sup>th</sup> Edition, Pearson (2017)
2. Malvino, Principle of Digital Electronics, McGraw-Hill
3. R.P. Jain - Modern Digital Electronics, McGraw-Hill, 4th ed. 2010
4. LaMerez, Quick Start Guide to Verilog, Springer (2019)
5. M. Rafiquzzaman - Digital Logic, with an Introduction to Verilog and FPGA-Based Design, Wiley (2019)

## **PRACTICALS (2 CREDITS)**

User a Verilog/System Verilog simulator like ModelSim or Icarus Verilog to simulate the following digital circuits:

1. Implement the following logic gates in Verilog:
  - a. A 2-input AND Gate
  - b. A 3-input OR Gate
2. Implement the following logic gates in Verilog and simulate them using a test bench:
  - a. A 2-input NAND Gate
  - b. A 2-input NOR Gate
3. Design and simulate 3-input XOR gate in Verilog.
4. Design and simulate a module in verilog that implements the following boolean logic: a.
5. Design and simulate a half adder in Verilog
6. Design and simulate a full adder in Verilog
7. Design and simulate a 4-bit binary adder in Verilog
8. Design and simulate a 2-to-1 multiplexer in Verilog
9. Design and simulate a 4-to-1 multiplexer assembled from three 2-to-1 multiplexers in Verilog
10. Design and simulate a 3-to-8 decoder in Verilog
11. Design and simulate a clocked D Flip Flop with reset input in Verilog
12. Design and simulate a simple 4-bit ALU in Verilog that performs addition, subtraction, AND, and OR operations

**BACHELORS WITH ENVIRONMENTAL SCIENCE EDUCATION AS VALUE ADDED COURSE**  
**1<sup>st</sup> to 2<sup>nd</sup> SEMESTERS**

**ESE024V: ENVIRONMENTAL SCIENCE EDUCATION**

**(CREDITS - 02)**

**LEARNING OBJECTIVES:**

*This course attempts to create pro-environment attitude and a behavioural pattern in student community and society that attaches importance and priority to create sustainable life style and awareness on various environmental issues.*

**LEARNING OUTCOMES:**

*This course is expected to inculcate a critical thinking on various dimensions of environment through knowledge, skill, critical thinking and problem-solving.*

**COURSE CONTENT**

**UNIT 1: UNDERSTANDING THE ENVIRONMENT**

- Environment: concept, importance and components
- Ecosystem: Concept, structure and function (food chain, food web, ecological pyramids and energy flow)
- Ecosystem services: (Provisioning, regulating and cultural)
- Biodiversity: levels, values and threats and conservation
- Concept and objectives of environmental education, environmental ethics

**UNIT 2: NATURAL RESOURCES AND ENVIRONMENTAL POLLUTION**

- Natural resources: Renewable and non-renewable (Global status, distribution and production)
- Management of natural resources: Individual, community and government managed
- Air, water and soil pollution: Causes, consequences and control
- Solid waste management: Collection, segregation, transportation and disposal; 3R's
- Climate change: Causes and consequences

**SUGGESTED READINGS:**

- Asthana, D. K. Text Book of Environmental Studies. S. Chand Publishing.
- Basu, M., Xavier, S. Fundamentals of Environmental Studies, Cambridge University Press, India.
- Basu, R. N., (Ed.) Environment. University of Calcutta, Kolkata.
- Bharucha, E. Textbook of Environmental Studies for Undergraduate Courses. Universities Press.
- Miller T.O. Jr., Environmental Science, Wadsworth Publishing Co.
- Wagner K.D. Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p.
- Mckinnecy, M.L. & Schoch. R.M. Environmental Science systems & Solutions. Web enhanced edition. 639p.

## COURSE OUTLINE FOR CERTIFICATE COURSE “JUNIOR SOFTWARE DEVELOPER”

<b><i>Name of Certificate Course</i></b>	<i>Junior Software Developer</i>
<b><i>NSQF Level</i></b>	4
<b><i>Eligibility</i></b>	Students pursuing undergraduate programme in Science Stream
<b><i>Batch Size</i></b>	30

**TABLE-I (12 CREDITS TO BE OFFERED IN EMBEDDED MODE IN 3<sup>RD</sup>/4<sup>TH</sup>, 5<sup>TH</sup> & 6<sup>TH</sup> SEMESTER)**

<b><i>Course Code/Course Title</i></b>	<b><i>Credit Weightage</i></b>			<b><i>Duration in Number of Hours</i></b>
	<b><i>Theory</i></b>	<b><i>Practical</i></b>	<b><i>Total</i></b>	
<b><i>JSD-1</i></b> Programming with C (Basic)	2	2	4	90
<b><i>JSD-2</i></b> Programming with Python	2	2	4	90
<b><i>JSD-3</i></b> Advanced Python Programming	2	2	4	90

To facilitate forward linkage of skill courses of 12 credits indicated in Table-I with the earning of UGC/NSQF skill certificate, add-on courses of 18 credits as indicated in Table-II are available on optional basis.

**TABLE-II (18 CREDITS ADD-ON COURSES FOR CERTIFICATE COURSE “JUNIOR SOFTWARE DEVELOPER”)**

<b><i>Course Code/Course Title</i></b>	<b><i>Mode of training</i></b>	<b><i>Venue of training</i></b>	<b><i>Credit Weightage</i></b>	<b><i>Duration in Number of Hours</i></b>	<b><i>Semester in which to be offered</i></b>
<b><i>JSD-4</i></b>	Three Weeks Industrial Workshop-I	To be decided in consultation with Mentor Institution	6	90	These credits can be covered during winter vacations/ or after semester-end exams depending upon the availability of time
<b><i>JSD-5</i></b>	Three Weeks Industrial Workshop-II	To be decided in consultation with Mentor Institution	6	90	
<b><i>JSD-6</i></b>	Three Weeks Industrial Internship	To be decided in consultation with Mentor Institution	6	90	

**1<sup>st</sup> SEMESTER**  
**COMPUTER APPLICATIONS**  
**(JUNIOR SOFTWARE DEVELOPER)**  
**SKILL ENHANCEMENT COURSE (SEC)**

**JSD122S: PROGRAMMING WITH C (BASIC)**

**CREDITS: THEORY: 2, PRACTICAL: 2**

**THEORY (2 CREDITS)**

**UNIT 1 – C LANGUAGE FUNDAMENTALS (15 LECTURES)**

Introduction to Programming, Compilers, Interpreters and Assembler. Algorithm and Flowchart, Introduction of C Language. Reserved Words, Built-In Data Types, Variables, Operators and Expressions, Statements, Compound Statements. Using Standard Inputs and Output Functions (printf, scanf). Editing Compiling & Linking a Program. The C-preprocessor and its use in Macro Definition, Operators: Assignment, Arithmetic, Relational, Logical, Conditional and Assignment Operator. Increment & Decrement (pre & post) Operators, Bitwise Operators. Control Statements: If, else & Switch-Case.

**UNIT 2 – CONTROL STATEMENTS, LOOPS, ARRAY AND FUNCTIONS (15 LECTURES)**

Loop Statements: for, while, do while (with break & continue) Statements. Nested Loops.

Arrays: Array Initialization, Multi-Dimensional Arrays; Character Arrays & Strings; String Processing Functions.

User-Defined Functions: Prototype & Definition; Parameter Passing. Recursive Functions. Scope & Lifetime of Variables.

**Reference Books:**

1. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill.
2. Torrence W Pratt, Programming Language Design and Implications, PHI.
3. Gottfried Programming with C.
4. Let Us C by Yashwant Kanetkar BPB Publications.

## PRACTICALS (CREDITS: 2)

### LAB SHEET-PROGRAMMING WITH C (BASIC)

1. Write a program in C to read value of variable and display it,
2. Write a program in C to find sum of two numbers entered by the user.
3. Write a program in C to demonstrate the use of arithmetic operators.
4. Write a program in C to demonstrate use of relational operators.
5. Write a program in C to demonstrate the use of increment and decrement (pre and post) operators.
6. Write a program in C to check whether a number entered by user is odd or even.
7. Write a program in C to find largest of three numbers.
8. Write a program in C to display first  $n$  natural numbers.
9. Write a program in C to find sum of first  $n$  natural numbers.
10. Write a program in C to compute factorial of a number.
11. Write a program in C to compute Fibonacci series.
12. Write a menu driven program in C to perform addition, subtraction and multiplication of two numbers. Make use of switch-case statement
13. Write a program in C to demonstrate use of conditional operator.
14. Write a program in C to display individual digits of a number.
15. Write a program in C to compute sum of digits of a number.
16. Write a program in C to reverse a number.
17. WAP to compute the sum of the first  $n$  terms of the following series  
 $S = 1 + 1/2 + 1/3 + 1/4 + \dots$
18. WAP to compute the sum of the first  $n$  terms of the following series  
 $S = 1 - 2 + 3 - 4 + 5 - \dots$
19. Write a program in C to demonstrate argument passing *by value* and *by reference*
20. Write a function in C to compute factorial of a number.
21. Write a recursive function in C to compute factorial of a number.
22. Write a program in C to demonstrate use of basic Math functions inbuilt in C
23. Write a program in C to create an array, read its elements from user, traverse / display the individual elements.
24. Write a program in C to compute sum of elements of an array
25. Write a program in C to check whether an element exists in an array or not.
26. Write a program in C to create a two dimensional array, read its elements, traverse/display the individual elements.
27. Write a program in C to find sum of two matrices
28. Write a program in C to compute multiplication of two matrices.
29. Write a program in C to demonstrate basic String functions.
30. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not



**SEMESTER: 1<sup>st</sup> to 3<sup>rd</sup>**  
**ABILITY ENHANCEMENT COURSE**

**CNS122A: COMMUNICATION SKILLS COURSE**

**CREDITS: 3**

**Unit I**

- Communication: An Introduction
- Definition and Scope
- Process of Communication
- Barriers to Communication (semantic/linguistic, physical, psychological, socio-cultural)/Overcoming Barriers
- Verbal/Non-Verbal Communication

**Unit II: Soft Skills**

- Introduction to Soft Skills
- Personality Development/Emotional Intelligence
- Time Management/leadership Skills
- Interpersonal relations/Public Speaking
- Facing Interviews/ Group Discussion/Presentation Skills

**Unit III: Writing Skills**

- Letter Writing- Formal and Informal
- CV, Email, Message
- Minutes, Report Writing
- Notice, Memoranda
- Short Speech

*Note: Adequate practice to be given in the class to improve speaking and writing competence*

**Textbook recommended: *Step Ahead with English* (Published by Orient BlackSwan)**

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## Semester I to III

### Multi-Disciplinary Course

#### ECO022I: ECONOMICS (INTRODUCTORY ECONOMICS)

**CREDITS: 3**

**Course Objectives:** The course is designed to expose the students to the basic principles of economic theory. The course illustrates how economic concepts can be applied to analyze real life situations.

#### **Learning Outcomes:**

After completing this course, the students are expected to:

**LO1:** Develop a basic understanding of theoretical concepts in economics

**LO2:** Exhibit a basic understanding of the theory of demand and its exceptions.

**LO3:** Exhibit a basic understanding of National Income and its measurement

#### **Unit I: Introduction**

**(15 Marks/ 1 credit)**

Definition and Scope of economics; Micro and Macroeconomics; Positive and Normative Economics; Scarcity, Choice and Opportunity Cost; Central Problems of an Economy; Economic Systems – Basic Economic Concepts

#### **Unit II: Introduction to Microeconomics**

**(15 Marks/ 1 credit)**

Demand – Determinants of Demand, Law of Demand and its Exceptions; Supply – Determinants and Law of Supply; Market Equilibrium; Utility – Concepts and Approaches, Total Utility, Marginal Utility; Indifference Curve – Assumptions and Properties; Budget Line, Consumer Preferences

#### **Unit III: Introduction to Macroeconomics**

**(15 Marks/ 1 credit)**

National Income – Concepts and Measurements; Circular Flow of Income; Price Indices – WPI, CPI and GDP deflator; Money – Types and Functions; Measures of Money Supply; Inflation – Meaning and Types; Stabilization policies- Fiscal and monetary policy.

#### **Basic Readings**

1. Mankiw, N (2020). Economics: Principles and Applications, 9<sup>th</sup> Ed. Cengage Learning.
2. Samuelson, P. & Nordhaus, W (2010). Principles of Economics. 9<sup>th</sup> McGraw-Hill, New York.
3. Bernheim, B. Douglas, and Michael Dennis Whinston. 2014. *Microeconomics*. New York, NY: McGraw-Hill/Irwin.
4. Ahuja H.L. (2020), Advanced Economic Theory— Microeconomic Analysis, 20<sup>th</sup> Edition, S. Chand & Company, New Delhi.
5. Ahuja, H. L (2020), “Macroeconomic -theory and Policy, 20<sup>th</sup> Edition, S. Chand and Company Ltd. New Delhi.

**FYUGP CURRICULAR FRAMEWORK FOR BACHELORS PROGRAMME WITH  
COMPUTER APPLICATIONS AS MAJOR**

SEMESTER	COURSE CODE	TYPE OF COURSE	TITLE OF COURSE	CREDITS	
				THEORY	PRACTICAL / TUTORIAL
I	CAP122J	CT-1	COMPUTER APPLICATIONS: COMPUTER FUNDAMENTALS	4	2
II	CAP222J	CT-1	COMPUTER APPLICATIONS: PROGRAMMING FUNDAMENTALS THROUGH 'C'	4	2
III	CAP322J	CT-1	COMPUTER APPLICATIONS: DATA COMMUNICATIONS AND COMPUTER NETWORKS	4	2
IV	CAP422J1	CT-1	COMPUTER APPLICATIONS: DBMS	3	1
	CAP422J2	CT-2	COMPUTER APPLICATIONS: OOPS WITH C++	4	2
	CAP422J3	CT-3	COMPUTER APPLICATIONS: COMPUTING MATHEMATICS	4	2
V	CAP522J1	CT-1	COMPUTER APPLICATIONS: OPERATING SYSTEM	3	1
	CAP522J2	CT-2	COMPUTER APPLICATIONS: DATA STRUCTURES USING 'C'	4	2
	CAP522J3	CT-3	COMPUTER APPLICATIONS: DISCRETE MATHEMATICS	4	2
VI	CAP622J1	CT-1	COMPUTER APPLICATIONS: PYTHON PROGRAMMING	3	1
	CAP622J2	CT-2	COMPUTER APPLICATIONS: COMPUTER ORGANISATION AND ARCHITECTURE	4	2
	CAP622J3	CT-3	COMPUTER APPLICATIONS: PROBABILITY AND STATISTICS	4	2
FOR FYUGP HONOURS					
VII	CAP722J1	CT-1	COMPUTER APPLICATIONS: CYBER SECURITY	3	1
	CAP722J2	CT-2	COMPUTER APPLICATIONS: JAVA PROGRAMMING	4	2
	CAP722J3	CT-3	COMPUTER APPLICATIONS: MACHINE LEARNING	4	2
VIII	CAP822J1	CT-1	COMPUTER APPLICATIONS: SOFTWARE ENGINEERING	3	1
	CAP822J2	CT-2	COMPUTER APPLICATIONS: MINI PROJECT WITH REPORT	4	2
	CAP822J3	CT-3	COMPUTER APPLICATIONS: MOBILE APPLICATION DEVELOPMENT	4	2
FOR FYUGP HONOURS WITH RESEARCH					
VII	CAP722J1	CT-1	COMPUTER APPLICATIONS: CYBER SECURITY	3	1
	CAP722J2	CT-2	COMPUTER APPLICATIONS: JAVA PROGRAMMING	4	2
	CAP722J3	CT-3	COMPUTER APPLICATIONS: MACHINE LEARNING	4	2
VIII	CAP822RJ1	CT-1	COMPUTER APPLICATIONS: RESEARCH METHODOLOGY	3	1
	CAP822P	PROJECT	COMPUTER APPLICATIONS: PROJECT WITH DISSERTATION	-	12

**HEAD OF THE DEPARTMENT / CONVENOR BOUGS**

**BACHELORS WITH COMPUTER APPLICATIONS AS MAJOR**  
**1<sup>st</sup> SEMESTER**

**CAP122J: COMPUTER APPLICATIONS \_ COMPUTER FUNDAMENTALS**

**CREDITS: THEORY - 04; PRACTICALS - 02**

**Course Objectives:**

1. *To introduce to the students the basic understanding of the working of a computer system.*
2. *To familiarize the students with the basic notations and data representation methods used.*
3. *To familiarize the students with the various software and hardware aspects of computers.*
4. *To make the students understand the need and working of the interconnection and communication between computers.*
5. *To make the students familiar with the basic internet technology and concepts.*

**THEORY (4 CREDITS)**

**UNIT – I**

Introduction to Computers, History, Generation of Computers, Data Processing, Memory Hierarchy. Input/ Output devices, BIOS, VDU

Data Representation - Binary, Decimal, Octal, Hexadecimal and their conversions, 1's and 2's compliment. Block Diagram of a Basic Computer and its working.

**UNIT – II**

Application Software and System Software, Open-Source Software and Proprietary Software.

Computer Languages and its types (Machine Language, Assembly Language, High Level Language) Translators, Compiler, Interpreter

Operating System and its functions, Types (Single-User, Multi-User, Multi-Tasking, Time-Sharing, Distributed, Real-Time)

**UNIT – III**

Data Communication - Need for Network Communication, Modes of Communication-Simplex, Duplex, Half-Duplex; Introduction to Networks, LAN, MAN, WAN

Protocols - Ethernet, IP, TCP, UDP, HTTP

Networking Elements - Switch, Router, Server, Firewall

**UNIT – IV**

Introduction of Internet and WWW, Basic working of a Web Browser, Introduction to popular web browsers. Concepts of URL, Domain Name, Web Server, Smartphone Apps, Email, Instant Messaging, ISP Communication and Collaboration: Using e-governance, search engines, Webhosting, netiquettes.

**COMPUTER FUNDAMENTALS LAB. (2 CREDITS)**

**MS WORD BASICS:**

1. Basics of Word Processing, Create, Save, Edit, open files.
2. Using the Interface (Menu Toolbars), Editing Text (Copy, Delete, Move Etc.). Finding and replacing text.
3. Insert: Table, images, textbox, word art, symbols.
4. Auto correct Feature, Grammar check Facility, Formatting and Editing, Font, Size, alignment paragraph, Bullets and numbering.
5. Table: Insert and Draw, changing cell width and height, insert/delete rows in columns.
6. Borders and shadings, Mail merge.

**MS EXCEL BASIC:**

Creating and opening worksheets, saving and data entry in cells.

7. Entry of Numbers, Text and Formulae, Moving Data in the Worksheet.
8. Selecting Data Range, Using the Interface (Toolbars, Menus).
9. Editing basics, working with Workbooks Saving, Cell Reference, Formatting, Editing.
10. Working with Data, charts, graphs.

**MS POWER POINT BASICS:**

11. Creating, opening and saving a PowerPoint slide.
12. Creating presentations using existing templates.
13. Entering and editing text. Inserting and deleting slides.
14. Use of fonts and drawing, inserting images, graphics., viewing and printing.
15. Creation of animated slides, adding images, graphics and sound in slides. Adding Timing, auto slide changes.

**REFERENCES:**

1. Fundamentals of Computers, V Rajaraman 6th edition PHI Learning Private Limited 2014
2. Computer today, Donald H. Sanders, McGraw Hill Publishing Company.
3. Microcomputers Software and Applications, Dennis P. Curtin and Leslie R. Portel, PHI.
4. Data Processing: An Introduction, Donald P. Spencer and Charles R. Merrill Pub. And Co.
5. Computers and Their Applications, Larry Joel Goldestein, PHI.
6. Computer Fundamentals. P. K. Sinha
7. Internet Basics. E. Douglas Commer PHI.