Course Code: 103
Course Title: Fundamentals of Computers

Course Code	103
Course Title	Fundamentals of Computers and Data
Credits	4
Course Category	Minor Course
Level of Course	100-199 (Foundation / Introductory)
Teaching per Week	4 Hours/Week
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	-
Implementation Year:	A.Y. 2024-2025
Purpose of Course	- Concepts and types of computer and various hardware technologies relevant to computer as well as some important peripherals will be covered. - Introduction of computer internal memories, number systems and conversions from decimal to binary. - Exposure of various input and output devices as well as concepts of Internet and relevant gadgets and their application - Understand the Concepts of Data and purpose of storing and managing data.
Course Objective	To provide knowledge of functional units, number System, Devices and memory & its storage, Data, concepts of data science and .
Pre-requisite	Fundamental Knowledge of Computers
Course Outcomes	**CO1:** Students will be able to develop interest in using computers for professional work. **CO2:** Students will be able to learn functional units of computers, how they process information with other computing systems and devices. **CO3:** Students will be able to understand basic computer hardware components. **CO4:** Students will be able to express the major concepts of Application software and System Software. **CO5:** Student will be able to learn how the computer represents and stores information using binary number system, and will be able to convert between binary and decimal number system. **CO6:** Students will be able to understand the functions of input output devices, know the different types of I/O Devices, and assess new technology used for I/O devices. **CO7:** Students will be able to understand types of data, processing and effective storage of data.
Mapping between Course Outcomes(CO) with Program Outcomes(PSO)	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	■	■						
CO2	■	■		■	■			
CO3					■	■	■	
CO4			■	■	■	■	■	
CO5		■		■	■			
CO6						■	■	■
CO7				■	■	■	■	■

Course Outcome	On completion of this course, students will get knowledge about functional units, number System, devices and memory and storage and fundamentals of Data and data storage.
Course Content	**UNIT-1: Introduction** 1.1 Introduction of Computer 1.2 Applications of Computer 1.3 Types of Computers – Super Computers, Mainframes, Mini Computers, Micro computers(Desktop, Laptop, Notebook, Tablet, Smart Phones) 1.4 Block Diagram and functional units of computer 1.5 Concepts of Address Bus and Data Bus 1.6 Concept of virtual memory and cache memory 1.7. Hardware Components 1.7.1. Motherboard 1.7.2. Types of Processor (CPU and GPU) 1.7.3. Memory: RAM(SRAM,DRAM, SDRAM), ROM, EPROM, EEPROM 1.8. Introduction to Software 1.8.1. Purpose and significance of Operating System 1.8.2. Concept of System Software and Application Software **UNIT-2: Number System** 2.1. Introduction of Decimal, Binary, Octal and Hexadecimal number Systems. 2.2 Conversion of Decimal to Binary and Binary to Decimal 2.3 Binary addition & subtraction 2.4 ASCII and ANSI character code **Unit-3: Concepts of Internet** 3.1. Concepts of Internet and WWW 3.1.1 Types of Internet Services 3.1.2 Hardware – Modem, Router, Blue tooth, Fire-Stick 3.1.3 Internet connections using Hotspot, WiFi, cable 3.2 Introduction of Cloud 3.2.1 Concepts of cloud 3.2.2 Purpose and application of Cloud (Example of GoogleDoc) 3.2.3 Concepts of Online Data Backup 3.3 Introduction of Web Browser and relevant terminologies : 3.3.1 URL, Address bar, Domain, Links, Navigation Buttons 3.3.2 Tabbed browsing, Bookmarks, History **Unit-4: Concepts of Data** 4.1 Concepts of Data and information 4.2 Types of Data (Quantitative and Qualitative) 4.3 Difference between structured and un structured data 4.3 Storage and processing concepts of data 4.3.1 Introduction of Data warehouse 4.3.2 Introduction of Data lake 4.3 Concepts of Data Science 4.3.1 Evolution of Data Science 4.3.2 Roles of Data Science 4.4 Applications of Data Science in various fields **UNIT-5: Understanding Data Collection and Data Pre-Processing** 5.1 Introduction of Data and Datasets 5.2 Samples of Data and Datasets 5.3 Data Pre-Processing Overview 5.4 Concepts and need of data pre-process 5.5 Concepts of Data Cleaning

Reference Books	1. How computer work: Ron White – Tech media 2. Introduction to computers: 4th Edition – Peter Norton 3. Fundamentals of Computers: V. Rajaraman 4. Computer Fundamentals: Pradeep K. Sinha & Priti Sinha (BPB) 5. Introduction to Networking RechardMcMohan Tata McGraw Hill Publication 6. HTML Black Book – Steven Holzner – Dreamtech Press 7. Computer Network Fundamentals and application – R S Rajesh Vikas Publication 8. HTML for the World Wide Web, Fifth Edition, with XHTML and CSS-Peachpit Press 9. "Data Science from Scratch: First Principles with Python" by Joel Grus, ISBN: 978-1492041139, Publisher: O'Reilly Media. 10. "Data Science for Business" by Foster Provost and Tom Fawcett, ISBN: 978-1449361327, Publisher: O'Reilly Media 11. "Python for Data Analysis" by Wes McKinney, ISBN: 978-1491957660, Publisher: O'Reilly Media 12. "The Elements of Statistical Learning: Data Mining, Inference, and Prediction" by Trevor Hastie, Robert Tibshirani, and Jerome Friedman, ISBN: 978-0387848, 570, Publisher: Springer
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	50% Internal assessment. 50% External assessment.