

TRIBHUVAN UNIVERSITY  
INSTITUTE OF SCIENCE AND TECHNOLOGY  
SCHOOL OF MATHEMATICAL SCIENCES  
**Bachelor in Mathematical Sciences (B.Math.Sc.)**

**Course of Study**

*Code No.:* MSCS 101

*Full Mark:* 75

**Paper:** Fundamentals of Computer Science

*Pass Mark:* 30

*Nature:* Theory and Lab work

*Credit:* 3

*Course Description:*

This course covers the basic concepts of computers and information technology including introduction, hardware, software, memory, input/output, data representation, database, networks and data communication, multimedia, and computer security.

*Course Objective:*

The main objective of this course is to provide students knowledge of fundamental concepts of computers and information technology.

*Contents:*

**Unit 1 Introduction to Computer**

**3 hrs.**

Introduction; Digital and Analog Computers; Characteristics of Computer; History of Computer; Generations of Computer; Classification of Computer; The Computer System; Application of Computers

**Unit 2 The Computer System Hardware**

**4 hrs**

Introduction; Central Processing Unit; Memory Unit; Instruction Format; Instruction Set; Instruction Cycle; Microprocessor; Interconnecting the Units of a Computer; Performance of a Computer; Inside a Computer Cabinet

**Unit 3 Computer Memory**

**4 hrs**

Introduction; Memory Representation; Memory Hierarchy; CPU Registers; Cache Memory; Primary Memory; Secondary Memory; Access Types of Storage Devices; Magnetic Tape; Magnetic Disk; Optical Disk; Magneto-Optical Disk; Using the Computer Memory

**Unit 4 Input and Output Devices**

**3 hrs**

Introduction; Input-Output Unit; Input Devices; Human Data Entry Devices; Source Data Entry Devices; Output Devices; I/O Port; Working of I/O System

**Unit 5 Data Representation**

**6 hrs**

Introduction; Number System; Conversion from Decimal to Binary, Octal, Hexadecimal; Conversion of Binary, Octal, Hexadecimal to Decimal; Conversion of Binary to Octal,

Hexadecimal; Conversion of Octal, Hexadecimal to Binary; Binary Arithmetic; Signed and Unsigned Numbers; Binary Data Representation; Binary Coding Schemes; Logic Gates

**Unit 6 Interaction of User and Computer**

**3 hrs**

Introduction; Types of Software; System Software; Application Software; Software Acquisition

**Unit 7 Operating System**

**3 hrs**

Introduction; Objectives of Operating System; Types of OS; Functions of OS; Process Management; Memory Management; File Management; Device Management; Protection and Security; User Interface; Examples of Operating Systems

**Unit 8 Data Communication and Computer Network**

**4 hrs**

Introduction; Importance of Networking; Data Transmission Media; Data Transmission Across Media; Data Transmission and Data Networking; Computer Network; Wireless Networking

**Unit 9 The Internet and Internet Services**

**4 hrs**

Introduction; History of Internet; Internetworking Protocol; The Internet Architecture; Managing the Internet; Connecting to Internet; Internet Connections; Internet Address; Internet Services; Uses of Internet

**Unit 10 Fundamentals of Database**

**5rs**

Introduction; Database; Database System; Database Management System; Database System Architectures; Database Applications

**Unit 11 Multimedia**

**3 hrs**

Introduction; Multimedia: Definition; Characteristics of Multimedia System; Elements of Multimedia; Multimedia System; Multimedia Applications

**Unit 12 Computer Security**

**6 hrs**

Introduction; Security Threat and Security Attack; Malicious Software; Hacking; Security Services; Security Mechanisms; Cryptography; Digital Signature; Firewall; Users Identification and Authentication; Other Security Measures; Security Awareness; Security Policy

**Laboratory Work:**

After completing this course, students should have practical knowledge of operating systems like DOS and Windows, Word Processors, Spreadsheets, Presentation Graphics, Database Management Systems, and Internet and its services.

**Recommended Books:**

1. Computer Fundamentals, Anita Goel, Pearson Education India, 2010
2. Computer Fundamental, Pradeep K. Sinha and Priti Sinha
3. fundamentals of computers, V. Rajaraman and Neeharika Adabala, Sixth Edition