

MCA(S1)01-01

**KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY**  
Housefed Complex, Dispur, Guwahati - 781 006



**Master of Computer Applications**

**COMPUTER FUNDAMENTALS AND PC SOFTWARE**

**CONTENTS**

- UNIT 1 : INTRODUCTION TO COMPUTER**
- UNIT 2 : BASIC COMPONENTS OF COMPUTER**
- UNIT 3 : INTRODUCTION TO OPERATING SYSTEM**
- UNIT 4 : MS DOS OPERATING SYSTEM**
- UNIT 5 : MS WINDOWS OPERATING SYSTEM**
- UNIT 6 : LINUX OPERATING SYSTEM**
- UNIT 7 : MICROSOFT WORD-PART I**
- UNIT 8 : MICROSOFT WORD-PART II**
- UNIT 9 : MICROSOFT EXCEL**
- UNIT 10 : FUNCTIONS IN EXCEL**
- UNIT 11 : MICROSOFT POWERPOINT**

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2. Prof. Jatindra Kr. Deka, Deptt. of Computer Science and Engineering, Indian Institute of Technology, Guwahati
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**SLM Preparation Team**

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**KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY**

Housefed Complex, Dispur, Guwahati - 781 006



**Master of Computer Applications**

**DIGITAL LOGIC**

**CONTENTS**

**UNIT 1 : NUMBER SYSTEMS**

**UNIT 2 : BOOLEAN ALGEBRA**

**UNIT 3 : LOGIC GATES**

**UNIT 4 : COBINATIONAL CIRCUITS**

**UNIT 5 : SEQUENTIAL ORGANIZATION**

**UNIT 6 : MEMORY ORGANIZATION**

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## COURSE INTRODUCTION

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This is a course on **Digital Logic**. Digital logic has fascinated many people over the years. Everything in the digital world is based on the binary number system. Numerically, this involves only two symbols: 0 and 1. Digital Logic is a method by which electrical circuits are provided with a limited ability to make decisions. The most common use of digital logic today is in the control and arithmetic functions of digital computers, without which modern life would grind to a halt.

The course consists of six units :

The *first* unit discusses various number systems like decimal, binary, octal, hexadecimal and their conversion from one form to another. The unit also includes the methods of addition and subtraction of binary numbers, complements and fixed/floating point representations. Concept of BCD, ASCII, EBCDIC, Gray code etc are discussed at the end.

The *second* unit is on Boolean Algebra. The unit discusses various concept associated with Boolean Algebra like Boolean operators, Boolean expression, representation of Boolean expression in Canonical form, Karnaugh Map, Don't care condition etc.

The *third* unit discusses various logic gates, their conversion, truth tables, and the most important De-Morgan's theorem.

The *fourth* unit focuses on combinational circuits. This unit gives us the concept various adders and subtractors, multiplexers, demultiplexers, encoders, decoders etc. with their applications.

The *fifth* unit deals with sequential circuits which includes the concept of flip-flops, counters, registers.

The *sixth* unit is the last unit of this course which is on memory organization. This unit gives us the concept of RAM and its types, 2D and 3D organization of RAM, ROM, types of ROM, organization of simple ROM cell etc.

Each unit of this course includes some along-side boxes to help you know some of the difficult, unseen terms. Some "EXERCISES" have been included to help you apply your own thoughts. You may find some boxes marked with: "LET US KNOW". These boxes will provide you with some additional interesting and relevant information. Again, you will get "CHECK YOUR PROGRESS" questions. These have been designed to self-check your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with "ANSWERS TO CHECK YOUR PROGRESS" given at the end of each unit.

# MASTER OF COMPUTER APPLICATIONS

## Digital Logic

### DETAILED SYLLABUS

	Marks	Page No.
<b>UNIT 1 : Number Systems</b>	<b>15</b>	<b>5-44</b>
Decimal, Binary, Hexadecimal and Octal. It's Conversion: Decimal to Binary/ Hexadecimal/Octal and vice versa. Addition/ Subtraction on Binary Numbers, Complement: r's and (r-1)'s complement. Fixed Point representation and Floating point representation, BCD, ASCII, EBCDIC, Gray code.		
<b>UNIT 2 : Boolean Algebra</b>	<b>15</b>	<b>45-60</b>
Boolean operators, Rules (postulates and basic theorems) of Boolean algebra, Dual and complement of Boolean expression, representation of Boolean expression in Canonical form, Boolean expression and their simplification by algebraic method and Karnaugh Map, Don't care condition.		
<b>UNIT 3 : Logic Gates</b>	<b>15</b>	<b>61-79</b>
Logic Gates(OR, AND, NOT, NAND, NOR, XOR, XNOR), Truth Tables, De-Morgan's theorem, Conversion of the logic gates.		
<b>UNIT 4 : Combinational Circuits</b>	<b>20</b>	<b>80-113</b>
Introduction to Combinational Circuits; Half-adder, Full-adder, Binary Parallel Adder, 4-bit Binary Parallel Adder, Serial Adder; Half-subtractor, Full-subtractor; Multiplexer: Basic 2-Input Multiplexer, 4-Input-Multiplexer, 8-to-1 Multiplexer, 16-to-1 Multiplexer, Multiplexer Applications; Demultiplexer: Parallel-to-Serial Converter, Data Distributors, 1-to-4 Demultiplexer; Encoder: Octal-to-Binary Encoder, Decimal-to-BCD Encoder; Decoder: Basic Binary Decoder, 3-line-to-8-Line Decoder, Magnitude Comparator		
<b>UNIT 5 : Sequential Circuits</b>	<b>20</b>	<b>114-141</b>
Sequential Circuits; Flip-Flops: RS, D, JK, MS; Counters: Asynchronous , Synchronous; Registers and its types, Shift Registers: Serial in-Serial out Registers, Shift-Left Register, Shift-Right Register, Serial-in-Parallel-out Shift Registers, Parallel-in-Serial-out Shift Registers, Parallel-in-Parallel-out Register, Applications of Shift Registers.		
<b>UNIT 6 : Memory Organization</b>	<b>15</b>	<b>142-158</b>
Random Access Memory : Types of RAM; Static RAM : Static RAM cell and its structure; DRAM : basic structure of DRAM; Organization of RAM : 2D organization, 3D organization; ROM : Types of ROM, organization of simple ROM cell.		

MCA(S1)03

**KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY**  
Housefed Complex, Dispur, Guwahati - 781 006



**Master of Computer Applications**  
**COMPUTER PROGRAMMING USING C**

**CONTENTS**

- UNIT- 1 : Introduction to Programming**
- UNIT- 2 : Operators and Expressions**
- UNIT- 3 : Decision and Control Structures**
- UNIT- 4 : Storage Class**
- UNIT- 5: Functions**
- UNIT- 6: Arrays and Pointers**
- UNIT- 7: Structure and Union**
- UNIT- 8: File Handling**

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## Subject Expert

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### **July 2011**

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## COURSE INTRODUCTION

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This is a course on **Computer Programming using C**. C language is a very popular and powerful programming language for creating computer programs. It is because, for most of the system software developments, efficiency of time and space become crucial and can be very effectively achieved by C language. C language is suitable for many applications as it has an excellent support of high-level and low-level functionality. Although several new high level languages have already been developed, C language has not lost its importance and popularity.

With this course the learners will be able to write codes in C languages. They will be able to develop programs using various features of the language.

The course consists of eight units.

The **first unit** introduces some basics of programming. It gives us the concept of pseudo code, algorithm, flow chart and the fundamental elements of programming.

The **second unit** concentrates on operators and expressions. Different types of operators like arithmetic, logical, relational, bitwise etc. are discussed in this unit. Concepts like precedence and associativity of operators are also covered in this unit.

The **third unit** deals with the decision and control structures. It includes Input/output functions like *scanf()*, *printf()*, *gets()*, *puts()*, different kinds of conditional statements and loop structures etc.

The **fourth unit** concentrates on storage classes. Two important concepts - *macros* and *preprocessor* directive are also introduced in this unit.

The **fifth unit** is on functions. With this unit, learners will be acquainted with function declaration, definition, function call, formal and actual parameter and the concept of recursion.

The **sixth unit** gives us the concept of arrays and pointers. It includes array declaration, accessing array elements, concept of strings, pointer variables, passing pointer to a function, and the most important dynamic memory allocation.

The **seventh unit** concentrates on structure and union. It includes structure declaration, definition, array of structures, pointer to structure, defining and declaring union and enumerated data types.

The **eighth unit** focuses on file handling. With this unit learners will be acquainted with different operations associated with files.

Each unit of this course includes some along-side boxes to help you know some of the difficult, unseen terms. Some "EXERCISES" have been included to help you apply your own thoughts. You may find some boxes marked with: "LET US KNOW". These boxes will provide you with some additional interesting and relevant information. Again, you will get "CHECK YOUR PROGRESS" questions. These have been designed to make you self-check your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with "ANSWERS TO CHECK YOUR PROGRESS" given at the end of each unit.

# MASTER OF COMPUTER APPLICATIONS

## Computer Programming using C

### DETAILED SYLLABUS

#### **Unit 1: Introduction to Programming** (Marks:12)

Basic Definition of Pseudo Code, Algorithm, Flowchart, Program, Elementary Data Types: Integer, Character, Floating Point and String Variables; Constants and Identifiers; Variable Declarations, Syntax and Semantics, Reserved Word, Initialization of Variable during Declarations, Symbolic Constants.

#### **Unit 2: Operators and Expressions** (Marks:12)

Expression in C; Different Types of Operators: Arithmetic, Relational and Logical, Assignment, Conditional, Increment and Decrement, Bitwise, Comma and Sizeof; Precedence and Associativity of Operators; Type Casting.

#### **Unit 3: Decision and Control Structures** (Marks:12)

Various Input /Output Functions: scanf, getch, getchar, printf, putchar; Conditional Statement- if, if- else, nested if-else switch; Other Statement: Break, Continue, Goto; Concept of Loops: While, Do-While, For, Nested Loop.

#### **Unit 4: Storage Class** (Marks:12)

Automatic, External, Static, Register, Scope and Lifetime of Variables, Macro, Preprocessor Directive.

#### **Unit 5: Functions** (Marks: 14)

Function: Function Declaration, Function Definition, Function Call, Function Parameters, Formal and Actual Parameter, Parameter Passing Methods, Recursive Function.

#### **Unit 6: Arrays and Pointers** (Marks: 14)

Arrays, 1-Dimensional Array, 2-Dimensional Array and its Declaration; String; Pointers: Declaration, Passing Pointer to a Function, Pointer and 1-Dimensional Arrays, Dynamic Memory Allocation.

#### **Unit 7: Structures and Union** (Marks: 12)

Structure Declarations, Definitions, Array of Structures, Pointers to Structures; Union: Definition, Declaration, Use; Enumerated Data Types; Defining Your Own Types (typedef)

#### **Unit 8: File Handling** (Marks: 12)

Opening, closing, reading and writing of files. Seeking forward and backward. Examples of file handling programs.

**PGDCA-04**

**PGDCA**

**FUNDAMENTALS OF NETWORKING  
AND WEB TECHNOLOGY**

**CONTENTS**

**UNIT 1 : INTRODUCTION TO COMPUTER NETWORK**

**UNIT 2 : NETWORK MODELS**

**UNIT 3 : TRANSMISSION MEDIA**

**UNIT 4 : INTERNET AND WWW**

**UNIT 5 : STATIC WEB PAGE DESIGN**

**UNIT 6 : HTML TAGS AND XML**

**UNIT 7 : JAVASCRIPT**

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## Course Coordinators

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## COURSE INTRODUCTION

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This is a course on ***Fundamentals of Networking and Web Technology***. This course is designed with an aim to acquaint the learners with the basics of computer network and web technology. The course introduces you to the hardware and the software needed for a network, explains how a small network is different from larger networks and the Internet.

The course consists of seven units.

The ***first unit*** includes the concept of computer network, how computers in a network are connected to each other and how they share information, different internetworking devices, transmission types as well as modes of communication etc.

The ***second unit*** is on network models which include concepts like protocol hierarchy along with ISO-OSI reference and TCP/IP models.

The ***third unit*** discusses various transmission media, wired as well as wireless technologies and various propagation methods.

The ***fourth unit*** deals with Internet and WWW which are very important concepts in the field of networking and Web.

The ***fifth unit*** is on web page design. Learners will be acquainted with basic HTML tags with the help of which they will be able to develop simple web pages.

The ***sixth unit*** deals with HTML forms and introduction to XML.

The ***seventh unit*** is the last unit of this course which introduces the learners to the concept of JavaScript.

Each unit of this course includes some along-side boxes to help you know some of the difficult, unseen terms. Some “EXERCISES” have been included to help you apply your own thoughts. You may find some boxes marked with: “LET US KNOW”. These boxes will provide you with some additional interesting and relevant information. Again, you will get “CHECK YOUR PROGRESS” questions. These have been designed to make you self-check your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PROGRESS” given at the end of each unit.

# POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS

## Fundamentals of Networking and Web Technology

### DETAILED SYLLABUS

#### **UNIT 1 : Basics of Computer Network**

Computer Network: Definition, Goals; Broadcast and Point-To-Point Networks; Connectionless and Connection-Oriented Services; Network Devices; Network Topologies; Types of Network: LAN, MAN, WAN; Server Based LANs and Peer-to-Peer LANs; Transmission Types; Modes of Communication; Switching Techniques

#### **UNIT 2 : Network Models**

Design Issues of the Layer, Protocol Hierarchy, ISO-OSI Reference Model: Functions of each Layer; Various Terminology used in Computer Network; Connection-Oriented and Connectionless Services, Internet (TCP/IP) Reference Model, Comparison of ISO-OSI and TCP/IP Model

#### **UNIT 3 : Transmission Media**

Transmission Medium, Guided Media: Coaxial Cable, Twisted Pair, Fiber Optics Cable; Unguided Media: Radio Waves, Infrared, Micro-wave, Satellite

#### **UNIT 4 : Internet Basics**

Internet: Architecture, Accessing, Internet Service Providers (ISP), Organization of Internet Protocol suite, IP Address, DNS, URL; World Wide Web (WWW): Web Page, Web Servers, Web Browsers, Cookies

#### **UNIT 5 : Static Web Page Design**

Basics of HTML; Document Structure tags; Formatting tags; List tags; Hyperlink and Image tags; Table tags; Frame tags; Form tags.

#### **UNIT 6 : HTML Tags and XML**

HTML Form; Additional Advanced HTML Tags; Introduction of XML.

#### **UNIT 7 : JavaScript**

Client Side Programming; Basic Programming Concepts; Control Structures in JavaScript; Array; Functions;, Working With Form Object; Built-in Objects in JavaScript, User Defined Objects in JavaScript

**MCA(S2)05**

# **UTTARAKHAND OPEN UNIVERSITY**



**Master of Computer Applications**  
**COMPUTER ORGANIZATION AND ARCHITECTURE**



**KRISHNA KANTA HANDIQUE STATE OPEN UNIVERSITY**  
Housefed Complex, Dispur, Guwahati - 781 006

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**Subject Expert**

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Prof. Diganta Goswami, Deptt. of Computer Science and Engineering,  
Indian Institute of Technology, Guwahati

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4	<b>Bhaskar Deka</b> , Assistant Professor, Institute of Science and Technology, Gauhati University
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**Dec., 2011**

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MCA(S2) 06

# UTTARAKHAND OPEN UNIVERSITY



**Maaster of Computer Application**

**DATA STRUCTURE THROUGH C LANGUAGE**



**KRISHNA KANTA HANDIQUE STATE OPEN UNIVERSITY**  
Housefed Complex, Dispur, Guwahati - 781 006

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**Subject Experts**

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  3. Prof. Diganta Goswami, Deptt. of Computer Science and Engineering, Indian Institute of Technology, Guwahati
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**Course Coordinators**

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MCA(S2) 07

# UTTARAKHAND OPEN UNIVERSITY



**Maaster of Computer Application**

## **FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS**



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**December, 2011**

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