FACULTY OF SCIENCE

SYLLABI

FOR

INFORMATIONS AND COMMUNICATION TECHNOLOGY
CERTIFICATE /DIPLOMA (ADD-ON COURSE)

EXAMINATIONS : 2021
INFORMATION AND COMMUNICATION TECHNOLOGY CERTIFICATE
(1\textsuperscript{ST} YEAR) ADD-ON-COURSE SESSION

CERTIFICATE COURSE

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Paper Name</th>
<th>Lectures/week</th>
<th>Practical/week</th>
<th>Ext</th>
<th>Int</th>
<th>Total Univ. Exam Marks</th>
<th>Exam Hours</th>
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<tbody>
<tr>
<td>A</td>
<td>Introduction to Information Technology</td>
<td>03</td>
<td>00</td>
<td>65</td>
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<td>B</td>
<td>PC Software</td>
<td>03</td>
<td>00</td>
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INFORMATION AND COMMUNICATION TECHNOLOGY
DIPLOMA (2\textsuperscript{ND} YEAR) ADD-ON-COURSE

DIPLOMA COURSE

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<tr>
<th>Paper Code</th>
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<tbody>
<tr>
<td>A</td>
<td>Introduction to Computer Network &amp; Internet Programming</td>
<td>03</td>
<td>00</td>
<td>65</td>
<td>5</td>
<td>70</td>
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<td>B</td>
<td>Programming Fundamentals Through “C” Language</td>
<td>03</td>
<td>00</td>
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<td>C</td>
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Objective: To make students understand basic concepts related to computers and Operating Systems.

Note:
  i. The Question Paper will consist of Four units.
  ii. Examiner will set total of **Nine** questions comprising **Two** questions from each unit and **One** compulsory question of short answer type covering whole syllabi.
  iii. The students are required to attempt **One** question from each unit and the Compulsory question.
  iv. All questions carry equal marks unless specified.
  v. Use of non-programmable scientific calculator is allowed.

**UNIT - I**

*Computer Fundamentals*: Historical evolution of computer, characteristics of computers capabilities and limitations of computers, Computer generations.

*Types of Computers:*

*Desktops, Laptops, Palmtop, PDA*

Application of Computers: Computer and their impact on society, computer in education, commercial data processing, public utilities and computers in home.


**UNIT - II**

*Block diagram of Computer identifying various components and their functions.*

*Primary Memory*: Concepts of RAM, ROM, EPROM etc.

*Secondary Memory*: Floppy disk, hard disk. DVD, compact disk (Read only, Write only, Rewritable CD’s)

*I/P Devices*: Keyboard, light pen, Mouse, joystick, trackball, scanner, barcode reader, data gloves, voice input systems.

*O/P Devices*: Types of printers like character, link page printers, impact and non impact printers, plotters, voice output systems.

**UNIT - III**

*Number System*: Non Positional and Positional number system, binary, octal, decimal hexadecimal number systems, arithmetic (addition, subtraction, multiplication and division) in different number systems, base conversion between two different number systems Binary Arot6hmetic and Boolean algebra.

*Binary Codes*: BCD, ASCII, EBCDIC codes.
UNIT - IV

**Introduction to operating system**: Definition, need of system, operating system services, functions of operating systems as resource manager.

**Types of operating systems**: Simple batch systems, multi-programmed systems, time.

Sharing systems, multi tasking system, multi user systems, multi processor systems. Network Operating System.

**Introduction to System Software**: System VS Application Software, Compiler Vs Interpreter, Linker, Loaders.

**References**
1. V. Rajaraman, Fundamentals of Computers, PHI
2. Lary Long and Nancy Long, Computers, PHI.
Objective: To make students understand that working of DOS, Windows, Word Processing, PowerPoint Package and Spreadsheets.

Note:

i. The Question Paper will consist of Four units.
ii. Examiner will set total of **nine** questions comprising **two** questions from each unit and **one** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **one** question from each unit and the Compulsory question.
iv. All questions carry equal marks unless specified.
v. Use of non-programmable scientific calculator is allowed.

UNIT - I

Disk Operating System: DOS, system files, commonly used Internal and External Commands, Batch Files, Config.Sys and Autoexec. Bat.


Maintenance-Recycle Bin, Disk Cleanup, Add and Remove Programs.

UNIT - II

Word Processing: Introduction to World Processing, Toolbars, Ruler, Menu, Keyboard Shortcut. Previewing documents, printing documents, Formatting documents, Checking the grammar and spelling, formatting via find and replace, Using the Thesaurus, using Auto Correct, word count Hyphenating, Mail merge, mailing Labels Wizards and Templates, Handling Graphics, tables as Converting a word document into various formats.

UNIT - III

Power-Point Package: Introduction, Elements of Power Point Package, Starting and exploring Power Point menus (Insert, Format, Tools, Slide Show, Window, Help options and all of their features, Options and sub options etc.), Creating, inserting, deleting and formatting slides, Formatting and enhancing text, Slides with graphs, Giving Animation to slides, Transfer of files between Power Point and other word processors and software packages.

UNIT - IV

Spreadsheets: Creating worksheet, entering data into worksheet, Entering, data, dates, alphanumeric, values, saving & quitting worksheet, Opening and moving and existing worksheet, Toolbars and Menus, keyboard shortcut. Working with
single and multiple workbooks, working with formulation & cell referencing, formatting of worksheet.

References:

PAPER : C PRACTICAL BASED ON PAPER A & B
Maximum Marks: 60 Time: 4 Hrs.
Minimum Pass Marks: 35% Practical Units to be conducted : 30

The laboratory course will comprise of exercise from Paper A & B.

The break up of marks for the practical will be as under:
Lab Record : 10 Marks
Viva Voce : 15 Marks
Program Development and Execution : 35 Marks
Objective: To make students understand Networking concepts, concepts related to Internet and HTML.

Note:

i. The Question Paper will consist of Four units.

ii. Examiner will set total of **Nine** questions comprising **Two** questions from each unit and **One** compulsory question of short answer type covering whole syllabi.

iii. The students are required to attempt **One** question from each unit and the Compulsory question.

iv. All questions carry equal marks unless specified.

UNIT - I

Computer networks- Hardware, Software, users, goals and applications of computer networks.

Types of Network: Local area networks, wide area networks, metropolitan area networks and value added networks - their features.

Transmission media: Magnetic media, twisted pair, coaxial cables, fibre optics, radio transmission, microwave transmission, infrared waves and Line of sight transmission, Cellular radio and communication Satellites.

UNIT - II

Internet: What is Internet, its advantages, disadvantages, internet facilities through WWW and HTML, Internet Protocols, TCP/IP, FTP, newsgroups, remote logins, chat groups etc.

WWW: the client side, the server side, web browsers, web pages, locating information on the web.

E-Mail: architecture, various aspects, the user agent, message format, message transfer, e-mail privacy.


UNIT - III

HTML: Introduction to HTML, SGML, Internet and Web structure of HTML document.

Starting an HTML document: Head element, body element, style element, Script element, Text formatting, using lists to organise information.

Organising Data with Table: Basic table Structures, individual cells and headings, vertical controls, database considerations, displaying real data with a table.

Table Layout and Presentation: Table Syntax, two column layout, staggered body with an index, traditional newspaper layout.
UNIT - IV

Uniform Resource Locators (URLs): Absolute URLs, Relative URLs, fragment URLs, Types of URL Schemes- HTTP, mailto, news, FTP, Telnet, File etc.
Using Hyper Links and Anchors: Uses to Hyper Links, Structure of Hyper Links, Links to specialised contents.
Images: Adding Images to web page, using images as links, creating menus with image maps, image formats-GIF, JPEG etc.

REFERENCES :

5. Rick Darnell et al, HTML 4 Unleashed, Tech media Publications.
Objective: To make students understand how to programme in C language.

Note:

i. The Question Paper will consist of Four units.

ii. Examiner will set total of NINE questions comprising TWO questions from each unit and ONE compulsory question of short answer type covering whole syllabi.

iii. The students are required to attempt ONE question from each unit and the Compulsory question.

iv. All questions carry equal marks unless specified.

UNIT - I

Programming process: Problem definition, program design, coding, compilation and debugging.

Fundamentals of C: Identifiers and keywords, data types, input and output, type conversion, operators and expressions: Arithmetic, unary, logical and relational operators, assignment operator, conditional operator, and library functions.

UNIT - II

Control statements: branching, looping using for, while and do-while statements, nested control structures, switch, break and continue statement

Functions: definition, call prototype and passing arguments to a function, recursion versus iteration

Storage classes: automatic, external and static variables.

UNIT - IV

Arrays: Definition, accessing elements, initialization, passing to functions, multi dimensional arrays, strings

Pointers: address and referencing operators, declaration, assignment, passing pointer to functions, pointer arrays

UNIT - IV

Structures: variables, accessing members, nested structures, pointer to structures and union.

Files in C: Sequential files, random access files, Unformatted files, Text files, binary files.
Text Book:

References:
1. Ram Kumar and Rakesh Aggarwal : Programming in Ansi C, TMH

Paper : C Practical Based On Paper A And B

Maximum Marks: 60 Time: 4 Hrs.
Minimum Pass Marks: 35% Practical Units to be conducted : 60

The laboratory course will comprise of exercise to what is learnt under Paper A & B.

The break up of marks for the practical will be as under:

Lab Record : 10 Marks
Viva Voce : 15 Marks
Program Development And Execution : 35 Marks
### Advance Diploma Course

<table>
<thead>
<tr>
<th>Paper Code</th>
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<tbody>
<tr>
<td>A</td>
<td>Operating System</td>
<td>03</td>
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<td>65</td>
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<tr>
<td>B</td>
<td>ObjectOriented Programming Using C++</td>
<td>03</td>
<td>00</td>
<td>65</td>
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<td>70</td>
<td>03</td>
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</tbody>
</table>
PAPER A: OPERATING SYSTEM

Maximum Marks: 70
Minimum Pass Marks: 35%

Maximum Time: 3 Hrs.
Lectures to be delivered: 75 Hrs.

Note:

i. The Question Paper will consist of Four units.
ii. Examiner will set total of **Nine** questions comprising **Two** questions from each unit and **One** compulsory question of short answer type covering whole syllabi.
iii. The students are required to attempt **One** question from each unit and the Compulsory question.
iv. All questions carry equal marks unless specified.
v. Use of non-programmable scientific calculator is allowed.

SECTION-A

Introduction, OS Structure, services and components, multitasking, multiprogramming, time sharing, Real Time Systems, multithreading Process Management, CPU scheduling, Deadlocks

SECTION – B

Inter-process Communication, Concurrent Processing and concurrency control
Memory management, Virtual memory, Demand Paging and Page Replacement Algorithms

SECTION – C

I/O and Device management, buffering and spooling file management, file storage, Access methods and free space management

SECTION – D

Distributed & Multiprocessor system: Introduction to Distributed Operating system, Multiprocessor operating system organization, Recovery and Fault Tolerance
Case study of UNIX / LINUX: Introduction, kernel & shell, file system, shell programming

Reference Books:

1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley publishing

Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, code Extensibility and Reusability, User defined Data Types.

Introduction to C++: Identifier and keywords, Constants, Operators: Urinary, Binary, Tertiary- Airtmetic, relational, logical, conditional and assignment, Size of operator, Operator precedence and associativity. Type Conversion, variable Declaration, Expressions, Statements, Manipulators. Input and Output Statements, Stream IO.

Storage Class: Automatic, Static, Register, Extern.

Inbuilt Data Structures: Arrays, Array as Strings, Multidimensional Array, Structures, Unions. Bit fields, Enumerations and User defined types.

Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions.

Function: Prototyping, Definition and Call, Scope Rules, Parameter Passing Value, by address and by reference, Functions returning references, Const Functions, recursion, function overloading, Default Arguments, Const Arguments.

Classes, Objects and Members: Class Declaration and Class Definition, Defining member functions, Defining Object, making functions inline, Members access control, Nested Classes, This Pointer.

Object as function arguments, array of objects, functions returning objects, const members and member functions.

Static data members and static member functions.

Friend functions and Friend classes.

Constructors: Properties, types of constructors (Default, parameterized and copy), Dynamic constructors, Multiple constructors in classes.

Destructors: Properties, Virtual destructors, Destroying objects, Rules for constructors and destructors, Array of objects.

Dynamic memory allocation using new and delete operators.

Inheritance: Defining derived classes, inheriting private members, single inheritance, types of derivation, function, function redefining, constructors in derived class.
Types of inheritance: Single, Multiple, Multi level and Hybrid,
Types of base classes: Direct, Indirect, Virtual, Abstract, Code Reusability.

Section-D

Polymorphism : Methods of achieving polymorphic behaviour.
Operator overloading: Overloading binary operator, overloading unary operators, rules for
operator overloading, operator overloading using friend function. Function overloading,
early binding.
Polymorphism with pointers, virtual functions, late binding, pure virtual functions and
abstract base class. Difference between function overloading, redefining and overriding.
Files and Streams: Classes for file stream operations, opening and closing of files, stream
state member functions, binary file operations, structures and file operations, classes and file
operations, I/O with multiple objects, error handling, sequential and random access file
processing.

References:

2  Deitel and Deital, C++ How to program, Pearson Education 2001.
3  Robert Lafore, Object Oriented Programming in Turbo C++, Galgotia
4  Bajane Stautrup, The C++ Programming Language, Addition,-Wesley
5  Stanley B. Lippman, Losee Lajoic, C++. Primer; Pearson Education, 2002
7  D. Ravichandran, Programming with C++ - 2nd edition, Tata McGraw-Hill
    Publishing Company Ltd.

PAPER C: PRACTICAL BASED ON PAPER-A & PAPER-B

Max. Marks : 60  Practical units to be conducted: 60
Min. Pass Marks: 35%  Time allowed: 4 Hours

The laboratory course will comprise of exercises to supplement what is learnt under
Paper A and B.

The break up of marks for the practical will be as under:

<table>
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<tr>
<th>Category</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Lab Record</td>
<td>10</td>
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<tr>
<td>Viva Voce</td>
<td>15</td>
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<tr>
<td>Program Development</td>
<td>35</td>
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