



Uttar Pradesh Rajarshi Tandon Open University

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Syllabus

for

Basic Diploma in Computer (DIC)

(THE NEW COURSE STRUCTURE AND SYLLABUS WILL BE EFFECTIVE FROM THE ACADEMIC SESSION JULY 2015-16. THEREFORE THOSE STUDENTS WHO WILL BE ENROLLED/ADMITTED IN FIRST YEAR FROM SESSION JULY 2015-16 & ONWARDS WILL STUDY ACCORDING TO THIS NEW SYLLABUS AND THE STUDENTS ADMITTED BEFORE JULY 2015-16 WILL FOLLOW OLD SYLLABUS.)

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Basic Diploma in Computer (DIC)

1.1 Course Details and Structure

कम्प्यूटर में बेसिक डिप्लोमा (डी.आई.सी.) Basic Diploma in Computer (DIC)

कार्यक्रम कोड/ Programme Code	: 502	कार्यक्रम अवधि (वर्षों में)	: न्यूनतम : 1 अधिकतम	3
कार्यक्रम माध्यम/ Medium of Instruction	: अंग्रेजी / English	Programme Duration (in Yrs.)	: Minimum : 1 Maximum	3
प्रवेश हेतु न्यूनतम अर्हता/ Minimum Qualification for Admission	: 10+2	कार्यक्रम शुल्क/Programme Fee	: 8000/-	
		अधिच्यस कार्य/Assignment Work	: आवश्यक नहीं/ Not Essential	

Course Code and Details

Semester	Paper No.	Course Code	Title of the Course	Credits
1st Semester.	764	DIC-01	Personal Computer and PC Software	8
	765	DIC-02	Information Technology	8
Credits of 1 st Sem.				16
2nd Semester	766	DIC-03	Business System	8
	767	DIC-04	Programming and Problem Solving Using 'C' Language	8
	768	DIC-05 (P)	Project Work	8
Credits of 2 nd Sem.				24
Total Credits				40

1.2 DIC-01 (Personal Computer and PC Software)

Problem Solving Techniques:

Classical Problems and Puzzles: The Konigsberg Bridges, Cannibals and missionaries, Decanting problems, decision trees, classical Conundrums.

The Higher Arithmetic –I: Prime numbers, Gaps between primes, The sieve of Eratosthenes, Euler's proof of the infinitude of the primes.

The Higher Arithmetic-II: Hungarian problems, An Archimedean Result, the theorem

of Pythagoras and irrational numbers, The division of a plane by straight line, Minimum Spanning circles.

General Methods: Experimentation, five sailors, A monkey and Many coconuts, the twelve coins problem, Poin care on the Psychology of invention.

Introduction to MS-Excel:

Introduction to Excel: Excel Basics, worksheets, within workbook, Enter and Edit data in Excel, Range Names, Navigate worksheet, search and replace DATA, Rearrange cell contents, save and Protect workbook, Exit Excel.

Formatting and Printing worksheet: Page set up, Column width and Row Height, Fonts, Alignment, Numbers, Autoformat, Format Painter.

Customising Workplace: Excel windows, workplace, Displays, worksheet, at different Magnifications, using custom controls using dialaog Boxes.

Calculations in Worksheet: Formula basics, Functions.

Charts: Chart components, chart types, chart wizard, Resi- zing and moving charts, editing charts, use charts for analysis, printing charts.

Database Power of Excel: Database Concepts, creating, database, Adding Records, Deleting Records, Editing Records Sorting a database, Filtlering a database, Data tables , Pivot table.

Focus on analysis: Goal seek, Salver, Scenario Manager.

Automating Worksheet: Using Macros, using Templates.

Internet Awareness :

Internet :An Overview: DNS, working of Internet, Tools and Services on Internet, Browsing the Internet, Gopher.

Internet Tools: E-Mail, PTP & Telnet: E-Mail, E-Mail, Addressing, The Components of E-Mail, Address Book, Troubleshooting in E-Mail, Interesting E- Mail Addresses, Mail Reflectors, Mailing Lists and list servers, FTP and Telnet, Interesting Sites.

Browsers: Netscape Navigator, Search Engines, NCSA, Mosaic, Microsoft, Internet Explorer.

Visiting web sites: Downloading.

1.3 DIC-02 (Information Technology)

Information Technology: Computer Basics, Input Units and Devices, Output units, and Devices, Computer Memories, WINDOWS, Documentation using MS word.

Object Oriented Programming with C++: OOP using C++, Data types and variables, operators, Expressions and Statement, Flow of Control of Program, Looping, Functions, Arrays and Strings, Structure, Pointer, Classes and Constructors / Destructors, Operator overloading, Derived Classes and inheritance, Polymorphism and virtual functions.

1.4 DIC-03 (Business System)

Introduction to Business Data Processing: Business systems, Management Functions, Levels of management, Information requirements for Planning, Coordination and Control for various levels in Business, Industry and Government, large volumes of data and data handling

implicit, Identification of relevant data, classification of data elements by function and by source, Primary and Secondary, Historical data for reference and analysis, Need for ensuring accurate, reliable and timely processing of data, Basic tasks in Business data processing, data origination, Capture, sorting, merging, calculating, Summarising, managing output-results, storing and retrieving transmission, both interim and final

Concept of Files: Master and transaction files, file organization, sequential, relative and indexed, Modes of processing: batch Online, real time.

Principles and Techniques of Programming: Introduction to programming: Programme definition, Life cycle, characteristics of a good program, data handling (flow charts, pseudocodes) Report production and file updation, Simple report generation, overview of Control break procedure for report production.

Operation on files: Input, Output and I/O; processing a file, multiple handling file updation, sequential file updation, random file update.

Programming Paradigms: Unstructured Programming, Structured Programming, procedural programming, modular Programming Program design, Top down and bottom up design, program documentation.

Business Applications: Design, analysis and development of computerized financial accounting, Computerized Inventory Control, Computerized Payroll, Computerized Invoicing application.

1.5 DIC-04 (Programming and Problem Solving Using 'C')

Introduction:

Introductory: An Overview of C, Escape sequences, Getting A "feel" for C.

Data types in 'C': Variables of type (out char, float, double,); Enumerated type, the typed-of statement, identifiers.

Operators and Expressions: Elementary Arithmetic operations and operators, Expressions, L values and P values, Promotion and Demotion of variable types : The cast operator , print f() functions.

Decision Structures in 'C': Boolean operators and Expressions The goto statement, the if(), Statement, the if () – else statement.

Control structures-I: The do – while () and while Loops, the Comma Operator, the transfer of Central from within loops, Ternary, operator, The Switch case default statement.

Programming in C :

Control Structures II: The for (; ;) loop, uni-dimensional Arrays, The sizeof operator, storage classless and scope.

Pointers and arrays: Pointer variables and pointer Arithmetic, Pointers Arrays and the subscript operator, A Digression on Scan f(), Multidiensional Arrays.

Functions: Function Prototypes and Declarations, Functions and Scope, Pointers as Function Arguments, String Functions, Multi Dimensional Arrays as Function Arguments.

Functions – II: Recursive functions, Macros, Conditional Compilation, Macros with Parameters, Command, Line Arguments, Variable length Argument lists, Complicated Declarations, Dynamic Memory Allocation.

Files and Structs, Unions and Bit-Fields: Files, structs, the DOT Operator, structs and files: fseek (), structs and Function and Unions, The Bitwise operators.

Data Structures:

Introduction to Data Structures : Array: Programme Analysis, Arrays, Array Declaration, Storage of arrays in Main memory, sparse arrays.

Lists: Basic Terminology, Static Implementation of lists, Pointer implementation of lists, Doubly linked lists, circular linked list, Storage Allocation, Storage Pools, Garbage Collection, Fragmentation, Relocation and Compaction.

Stacks and Queues: Defining stack and Queue, stack operations and implementations, stack Applications, Queues: Operations, and implementation, Queue Application, priority Queues.

Graphs: Defining graph, Basic, Terminology, Graph Representation, Graph traversal (DFS, BFS), shortest path problem, Minimum spanning tree.

Trees and File Organisation:

Trees: Basic Terminology, Binary, trees, Traversals of a Binary, tree Binary search trees (BST).

AVL-Tree and B-Tree: Height Balanced tree, Building Height Balanced tree, B- Tree, B-Tree of order 5.

Files: Terminology, File organization, sequential files, Direct, File organization, Indexed Sequential file organization.

Searching and Sorting Techniques:

Searching Techniques: Sequential search, Binary Search.

Sorting Techniques-I: Internal Sort (Insertion Sort, Bubble Sort, Quick Sort, Way Merge Sort Heap Sort), Sortings on Several keys.

Sorting Techniques-II: Data Storage (Magnetic Tapes, Disks), sorting with Disks, K-way merging, Buffering, Sorting, with tapes.