GAUHATI UNIVERSITY
INSTITUTE OF DISTANCE AND OPEN LEARNING (GUIDOL)

Programme Project Report

(One Year Post Graduate Diploma)

PPR ID: GU/GUIDOL/PPR/14 *(Total no. pages : 10)*
Programme: Post Graduate Diploma in Computer Application (PGDCA)

1. **Programme mission and objective:**

The mission of the Programme to be launched is *"to provide computer education to all graduates for the development of their computer skills"*

Objectives of the Programme:

- *To develop computer skills among every individual related to different professional/organizational jobs and enhance their knowledge and understanding of the theoretical and practical foundations of Computer education.*
- *To generate competent and well-educated human resource for the teaching profession in public and private sector schools as computer teachers.*

2. **Relevance of the programme with HEI's mission and goals:**

Gauhati University was established in 1948 with a mission to revitalize educational leadership, to set the standard for the production and dissemination of knowledge as well as to become an effective instrument of change in the society. With this aim in view, the Department of Computer Science was established in 1985 by introducing a one-year Post Graduate Diploma in Computer Science and Application (PGDCSA) in 1986. In 2001, a two-year (four-semester) M.Sc. programme in Computer Science was introduced after obtaining approval from the UGC, replacing the PGDCSA programme. The PGDCSA programme was renamed as Post Graduate Diploma in Computer Application (PGDCA)

14/10/21

গৌহাটী বিশ্ববিদ্যালয়, গুৱাহাটী-১৪
Registrar
Gauhati University, Guwahati-14

15/10/21

DIRECTOR
IDOL, GAUHATI UNIVERSITY

and it has been introduced in different affiliated colleges of Gauhati University in conventional mode.

Keeping in view the motto of "*Quality Higher Education For All",* PGDCA was introduced in the ODL mode under the auspices of the ODL, Gauhati University in 2005. This programme to be offered through ODL mode is very much relevant to the HEI's mission and goals as it aims to provide quality higher education in computer application to those aspiring candidates who are deprived of computer education. Moreover, to keep the quality intact the curriculum and syllabus is designed at par with the conventional mode keeping in mind the specific needs and acceptability of the learners in the ODL mode and in keeping with the aims and objectives of the parent department. The curriculum is designed to enable learners to fulfill their aims and objectives in a manner they deem fit and proper.

3. **Nature and target group of learners:**

Our target group includes-

(i) Those learners interested in computer knowledge to develop their skills and unable to continue their computer education through the conventional mode of the Higher Educational Institute, Gauhati University

(ii) Those deprived of admission in the parent Department of regular mode due to limited intake capacity.

(iii) Those employed in various organization and would desire to pursue computer education as a passion or as a means for the development of their computer skills and movement up the promotional ladder

(iv) Job seekers

4. **Appropriateness of the programme to be conducted in the ODL mode for acquiring specific skills and competence:**

The PGDCA programme to be to be offered through ODL Mode will have certain learning outcomes. This programme will help the learners

- To develop their computer skills and prepare them for different professional/organizational jobs.
- To enhance and develop their knowledge and understanding of the theoretical and practical foundations of Computer education.

5. **Instructional Design**:

a) Curriculum Design: The curriculum is designed by a committee comprising experts from the parent department of the HEI and GUIDOL, keeping in view the needs of the diverse class of learners.

b) Detailed Syllabus: Refer to Enclosure-I.

c) Duration of the Program: Minimum 1(one) year. However, the learners are required to complete the programme within 2 (two) years from the date of admission.

d) Instructional Delivery Mechanism: The programme will be delivered in 2(two) semesters having 4(four) course/paper in each semesters. The learners will be provided with the printed/online SLM which covers almost all the contents in the syllabus *(Enclosure-III)*. Counseling class will be held in headquarter and various affiliated study centres. Telephonic Counseling and providing online learning resource will also be a part of instructional Delivery mechanism. In the current pandemic situation of COVID-19, more emphasis will be given to the teaching-learning through online mode. The progress of the learners will be evaluated by Term end/semester end theory and practical examination.

e) Course Coordinator – Prof. Anjana Kakoti Mahanta
Department of Computer Science, Gauhati University

f) Faculty:

(A) Full Time (ODL Mode)

I. Dr. Ridip Dev Choudhury, M.Sc. (Comp. Sc), Ph.D. -Assistant Professor
II. Dr. Khurshid Alam Borbora, M.Sc. (Comp. Sc), Ph.D. - Assistant Professor

III. Dr. Swapnanil Gogoi, M.Sc. (Comp. Sc), Ph.D. - Assistant. Professor

IV. Pallavi Saikia, M.Sc. (Comp. Sc)-Assistant. Professor

V. Hemanta Kalita, M.Sc. (IT), M.Tech(IT) - Assistant. Professor

VI. Dr. Rita Chakraborty, M.Sc. (IT), Ph.D. - Assistant Professor

(B) Part time resource persons will be drawn from amongst teachers of affiliated colleges, researchers and faculty staff of the Department of HEI.

g) **Media**: Print Media, ICT enabled tools, Multi-Media and e-Learning Portal.

h) **Student Support Service**: In order to successfully execute the programme, the University has a wide range of support services. The various support services are listed as below-

(i) Network of Study Centres: To assist its learner, the University has established 118 study centres throughout the State of Assam and within the territorial jurisdiction of Gauhati University.

(ii) State of the art Library with around 7 thousand collections of materials which includes books, journals, magazines, CD and DVDs.

(iii) E- Learning Portal: www.bodhidroom.net the first of its kind in the entire North east region of India which provides the following services to the students:

- Online enrolment of students
- Independent Discussion Forum for every course
- Independent News Forum for every course
- Online interaction facility with faculty members
- Online interaction between the students making the scope of collaborative learning
- Interaction through chatting of all users of all courses who are online.
- Separate Chat Room for individual course
- **Message My Teacher:** When a student logged on to Bodhidroom, after enrolling himself/herself to a course, he/she will see the names of the virtual class teachers. Student can directly send offline messages to the

teachers. When the teacher is logged on, he will receive an alert of incoming messages. Then he can reply to the message.

- Online Study Material
- Old Examination Question Papers

(iv) Dynamic Website (www.idolgu.in): Gauhati University has a dedicated dynamic website for ODL learners where one can get all the information regarding ODL programmes, up-coming events, examination result etc.

(v) Computerised admission process with provision of online admissions: The whole system of admissions and examinations are managed using professional software which gives instant online access to learners that can be accessed through www.idolgu.in .

(vi) Flexible Walk in Group Counselling (FWGC): Regular group and individual counselling will be held in the University as well as in the parent department during all working days. Learners may walk-in to the designated counselling room and meet their teachers to clarify their doubts. In the current pandemic situation of COVID-19, online platform will be provided for the purpose mentioned above.

(vii) Personal Contact Programme (PCP): In addition to the Study Materials, useful Personal Contact Programmes will be held at various affiliated study centres, which will enable the students to clarify their confusions and ease their difficulty while going through it. Qualified faculty members of affiliated study centres will help out the attending students by providing necessary tips and Guidelines during the interactive sessions. These sessions are also meant to give the students a chance to meet the teachers personally and discuss their problems. In the current pandemic situation of COVID-19, online platform will be provided for the purpose mentioned above.

(viii) Community FM Radio: Gauhati University has its own Community radio station named as "Radio Luit 90.8 FM" and operates daily from 8AM to 8PM. The Community Radio station shall be extensively used to broadcasts radio talks on various courses daily. The broadcast contents are designed as

per the requirements by teaching staff of both the ODL Institute as well as the parent department. Experts are outsourced if situation arises.

6. **Procedure for Admissions, Curriculum transaction and Evaluation**:

Admission: The admission process shall start as per the UGC guidelines. In the current pandemic situation of COVID-19, the learner can take admission through only online admission process. The minimum eligibility for PGDCA programme is any graduates from any recognized Indian or Foreign university. The proposed fee for admission is Rs 7000.00(Seven Thousand only) per semester. Financial Assistance is provided to the candidates belonging to the SC/ST and OBC category in the form of scholarship. Few learners belonging to the economically deprived section as well as the physically challenged category are provided free ship on the recommendation of the Vice Chancellor.

Curriculum transaction: The curriculum will be transacted throughout the year as follows:

- Regular Counseling/Classes/Practicals will be carried out for minimum of 4 (four) months per semester.

  a) 1st semester classes will start from the month of March and end by June every year.

  b) 2nd semester classes will start from the month of October and end by the end of January every year.

- Regarding the classes related to theory and practical courses/papers,

  a) One theory class, of one hour duration, for each course/paper is/will be conducted in a week.

  b) One practical class, of two hours duration, for each course/paper with practical component is/will be conducted in a week.

- For slow-learners, few remedial classes/counseling will be conducted as necessary.

For detailed Activity Planner refer to Enclosure – II.

Evaluation: The PGDCA Programme is/shall be of 1 year duration and is divided into two semesters. A Learner will get maximum 2 years to complete the programme. Each course shall carry 100% weightage for the term end examinations as well as for the practical. In order to pass/clear a course/paper in a subject, a candidate must secure minimum 35% marks in each course/paper of theory examination and 40% in practical course/paper examination. All examinations for ODL learners are conducted by the Controller of Examinations as per Rules and Regulations of the Gauhati University.

6. Library Resource and Laboratory Support:

(A) The University has a State of the Art Central Library with rich collections of materials which includes books, journals, magazines, CD and DVDs, and is accessible to the ODL learners as well. Moreover, the Institute has its own Library where various books, journals and magazines related to computer education are available.

Gauhati University being a member of UGC-Infonet Digital Library Consortium (http://www.inflibnet.ac.in/econ/index.php) which provides current as well as archival access to more than 5000 core and peer-reviewed journals and nine bibliographic databases from 23 publishers and aggregators in different disciplines. The ODL learners can access the e-resources of UGC-Infonet Digital Library Consortium from the Gauhati University campus.

(B) For conducting theory and practical classes, there are 2 (two) Digital Classrooms and 3 (three) Computer Laboratories with the following facilities:

	Item	**Quantity**
	Desktop Computer	55
	LCD Overhead Projector	1
	Document Scanner with Overhead Projector	1

Computer Lab 1	40 inch LED TV for parallel display with the LCD projector	1
	Smart Board	1
	Sound System with Lapel Connectivity	1 Set
	Split AC	4
	LAN Connectivity	
	Internet Connectivity provided by National Knowledge Network (NKN)	
Computer Lab 2	Desktop Computer	22
	55 inch LED TV used for projection	1
	Split AC	2
	LAN Connectivity	
	Internet Connectivity provided by NKN	
Computer New Lab	Desktop Computer	30
	LCD projector	1
	Motorised display screen(5x7)	1
	Split AC	2
	LAN Connectivity	
	Internet Connectivity provided by NKN	
Digital Classroom 1	Intake Capacity	64
	LCD Projector	1

	Sound System with Lapel Connectivity	1 Set
	Podium	1
	Split AC	3
	LAN Connectivity	
	Internet Connectivity provided by NKN	
Digital Classroom 2	Intake Capacity	100
	LCD Projector	1
	Sound System with Lapel Connectivity	1 Set
	Podium	1
	Split AC	4
	LAN Connectivity	
	Internet Connectivity provided by NKN	

8. **Estimated cost of the Programme**: total estimated cost of the programme is approximately Rs. 15 Lakhs which includes preparation and printing of SLMs, remuneration of the Resource persons, establishment cost and overheads. The estimate is evaluated considering the unit expenses of Rs.2.5 Lakhs per paper /1000 students for the entire duration of two years.

9. **Quality assurance Mechanism and Expected Programme outcome**: The institute has a *Centre for Internal Quality Assurance (CIQA)* constituted by the statutory body of the HEI. Members of the Cell are drawn from among the Deans of the different Faculty, Heads of the respective departments, Executive Council members, administrative staff and teaching staff of the institute. The Internal Quality Assurance Cell shall review the relevance and standard of the programme from time to time and make necessary

changes in the syllabus and contents of the programme. The HEI shall continuously monitor the effectiveness of the program through *CIQA* and other statutory bodies.

Expected Programme outcome: The expected programme outcome is reflected in the Course Benchmark Statement, which is stated as below-

Course Benchmark Statement: Post Graduate Diploma in Computer Application (PGDCA**)** shall be awarded to those learners who demonstrate:

- Development of their computer skills and prepare themselves for different professional/organizational jobs.
- Enhancement and development of their knowledge and understanding of the theoretical and practical foundations of Computer education.

ENCLOSURE- I

Distribution of Courses for PGDCA:

Total Marks: 800		Total Credits: 30	
Course No	**Course Title**	**Evaluation Pattern**	**Credit**
SEMESTER - I			
IT-01	**Fundamentals of Computers**	**Objectives:40%, Descriptive: 60%**	**3**
IT-02	**Introduction to Programming**	**Objectives:40%, Descriptive: 60%**	**4**
IT-03	**Digital Logic**	**Objectives:40%, Descriptive: 60%**	**3**
IT-04	**Practical Lab-1 (PC Software + Programming)**	**PC Software:70%, Programming: 30%**	**4**
SEMESTER - II			
IT-06	**Programming in C++**	**Objectives:40%, Descriptive: 60%**	**4**
IT-07	**Database Management System**	**Objectives:40%, Descriptive: 60%**	**4**
IT-08	**Computer Network & Internet**	**Objectives:40%, Descriptive: 60%**	**4**
IT-09	**Practical Lab-2 (Programming+DBMS+Internet)**	**Programming: 40%, DBMS: 30%, Internet: 30%**	**4**

Detail Syllabus

SEMESTER – I

IT-01: FUNDAMENTALS OF COMPUTERS

Introduction

Brief history of development of computers, computer system concepts, capabilities and limitations, types of computers: Analog, Digital, Hybrid, general, special purpose, Micro, mini, mainframe super computers, generations of computers, personal computers, types of personal computers – Laptop, Palmtop etc.

Computer software

Need of software, types of software, System software – Operating system and its types, loader, linker etc.; Application software --word processing, spread sheet, presentation graphics, database management software; Programming languages - machine, assembly, high level, 4GL, their merits and demerits, Computer Viruses.

Components of Computer System

Basic components of computer system, Input devices, output devices, Control Unit, storage devices, maintaining the Computer System.

PC Hardware and Maintenance

Introduction and Identification of different hardware component of a PC , Installation of Operating System, Hard Disk Partitioning ,Troubleshooting.

IT-02: INTRODUCTION TO PROGRAMMING

Introduction to C:

Steps for Problem Solving, Algorithm, Analysis of Algorithm Efficiency, Flowchart , Pseudo code, Program , Programming Languages , Translators

History of C , Features of C, Structure of a C Program, Writing a C Program, Compiling and Run a C Program, Syntax and Semantic Errors, Linker Errors, Logical and Runtime Errors, Execution Process

Variables and Constants:

Character Set, Identifiers and Keywords, Rules for Forming Identifiers , Data Types and Storage Classes in C, Variables , Declaring Variables, Initializing Variables, Constants, Types of constants

Expressions and Operators:

Assignment Statements, Unary and Binary Operators , Arithmetic Operators, Relational Operators , Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator, Precedence of Operators

Control Statements, Decision Control Statements:: The if Statement , The switch Statement, Loop Control Statements:: The while Loop , The do-while Loop ,The for Loop, The Nested Loop, The Goto Statement, The Break Statement, The Continue Statement

Arrays:

Definition , Syntax of Array Declaration and Initialization, Subscript, Processing the Arrays , Multi-Dimensional Arrays, Declaration and Initialization of Two-Dimensional Array, Processing of Two Dimensional Arrays, Representation of Matrix using Two Dimensional Array

Strings:

Character Arrays, Declaration and Initialization of Strings, Array of Strings,Library String Functions: strlen , strcpy , strncpy , strcmp , strncmp , strcmpi , strnicmp , strcat , strncat , strlwr , strupr , strrev , strdup, strchr , strset , strnset , strstr

Functions:

Definition , Structure of a Function , Function Declaration , Function Definition , Formal parameter , Actual parameter ,The Return Statement , Function Prototypes , Recursive Function, Function Calling: Call by value and Call by address

Structures and Unions:

Declaration and Initialization of Structures, Accessing the Members of a Structure , Structures as Function Arguments , Structures and Arrays , Unions , Initializing an Union, Accessing the Members of an Union

Pointers:

What is Pointer , Address and Indirection Operators , Pointer Type Declaration and Assignment, Pointer to a Pointer , Null Pointer Assignment , Pointer Arithmetic, Passing Pointers to Functions , Arrays and Pointers , Array of Pointers , Pointers and Strings

The C Preprocessor and Command Line Arguments:

Definition, Macros in C, #define, #include, #ifdef, Other Preprocessor Commands, Predefined Names Defined by Preprocessor

Command Line Arguments in C, Structure of Programs that use Command-Line Arguments, Accessing Command-Line Arguments

Files:

Definition, File Handling in C Using File Pointers, fopen( ) , fclose( ) , Input and Output using file pointers , Character Input and Output in Files, String Input / Output Functions , Formatted Input / Output Functions , Block Input / Output Functions, Sequential Files, Random Access Files , Positioning the File Pointer

IT-03: DIGITAL LOGIC

Binary Systems

Digital Computers and Digital Systems, Binary Numbers, Number Base Conversion, Octal and Hexadecimal Numbers, Complements, Binary Codes, Binary Storage and Registers, Binary Logic, Integrated Circuits

Boolean Algebra and Logic Gates

Basic Definitions, Boolean Algebra: Theorems and Properties, Boolean Functions, Canonical and Standard Forms and Other Logic Operations. Digital Logic Gates and its different types.

Simplification of Boolean Functions

Map Method: Two, Three and Four variable maps. Product of Sums Simplification, NAND and NOR implementation, Don't Care Conditions, Tabulation Method.

Combinational Logic and Sequential Logic

Adders: Half Adder, Full Adder and Binary Parallel Adder. Decoder, Encoder, Multiplexer, Demultiplexer.

Flip-Flops and its different types, Registers, Shift Registers, Counters.

IT-04: PRACTICAL LAB-1 (PC Software + Programming)

MS Office Suit

Exposure to Open Office

Programming in C

SEMESTER – II

IT-06: PROGRAMMING IN C++

Principles of OOP

What is OOP, Difference between OOP and Structured Programming, Basic Concepts of Class, Object, Data abstraction and Encapsulation, Inheritance , Polymorphism, Dynamic binding, Message passing, Benefits of OOP, OOP languages, Applications

Introduction to C++

Features of C++ , Structure of a C++ Program, The iostream file, cin and cout object, Saving a C++ program, Compiling and Running a C++ Program.

Variables, Constants, Operators and Expressions and Control Statements (if, switch, for, while, do-while) in C++.

Functions in C++

Return types in main(), function prototyping, Call by reference, Call by value, Call by address.

Inline functions, Default arguments, Constant argument, Function overloading.

Classes and Object:

Specifying a class, Member of a class, Access specifier , Use of scope resolution operator(::) , Creating object, Accessing class members, Defining member functions, Friend function, Friend class, Object as function arguments, Constructor , Constructor overloading, Default argument constructor, Copy constructor, Parameterized constructor, Default constructor, Destructors.

Inheritance:

Concept of Base class and Derive class, Types of Inheritance

IT-07: DATABASE MANAGEMENT SYSTEM

The Basic Concepts

The file based system, limitations of file based system, the Database Approach, Advantages of DBMS.

DBMS Architecture

Three level architecture of Database System, Mappings, Data Independence.

Components and Functions of DBMS, Database Administrator and its roles.

Entity, Attributes and Associations

Definition of Entity, attribute, association among entity and attributes, Generalizations and Aggregation.

Data Models

Relational Model, Hierarchical Model, Network Model

The Relational Model

The Relational Model, Domains, Attributes, Tuples, Relations and Views. Primary Key, Foreign Key, Candidate Key, Alternate Key, Super Key, Relational Constraints.

The E-R Model, Weak Entity and Strong Entity.

Relational Algebra

Basic operations – Union, Intersection, Difference and Product. Additional operations – Select, Project, Join and Divide.

Database Integrity and Normalisation

Referential Integrity, Entity Integrity. Functional Dependencies, Concept of Normalization, First Normal Form, Second Normal Form, Third Normal Form, Boyce Codd Normal Form.

Structured Query Language

What is SQL? Data Definition Languages, Data Manipulation Languages, Data Control Languages.

Database Recovery and Security

What is Recovery? Kinds of failures, Failure controlling methods, Database errors, Recovery Techniques, Security & Integrity, Relationship between Security and Integrity.

IT-08: COMPUTER NETWORK & INTERNET

Computer Network

Uses of computer networks, Types of computer networks: LAN, MAN, WAN etc., Networks topologies, Layered architecture. Interface and services, Connection-oriented and connectionless service, The relationship of services to protocol,

The OSI reference model, The TCP/IP reference model, Different inter-connecting devices: repeaters, hubs, bridges, switches, routers and gateways.

Physical layer: Guided and wireless transmission media, Satellite communication and their relative merits and demerits

Data link Layer: Functions of data link layer, faming error control flow control

Network Layer: Functions of network layer, Virtual circuit vs. datagram subnet, Routing, Internet protocol (IP)

Transport Layer: Basic functionality of transport layer, TCP and UDP protocol

Application Layer: Domain Name Service (DNS), electronic mail, ftp, telnet, www, http, URL

Internet

Overview

History of Internet, Internet services: telnet, e-mail – Definition, use, Equipments required for an Internet Connection, Opening an e-mail account, Reading and Writing e-mail.

Web browser, Components of a Web Browser, Web page, home page, web site, URL, introduction to e-commerce, Surfing the Internet., Search Engine, uploading and downloading.

Introduction to HTML

Hypertext Markup Language (HTML), Writing a web page in HTML, Tags, hyperlinks, URLs, tables, text formatting in web pages, Using graphics and multimedia in web pages; image maps., Use of frames and forms.

Introduction to JavaScript:

Constants, variables, operators, expressions, statements. Use of user-defined and built-in functions, Client-side Form validation using JavaScript, Using properties and methods of built-in objects.

IT-09: PRACTICAL LAB-2 (Programming + DBMS + Internet)

Programming in C++

My SQL/Oracle

HTML, Java Script, Hands on Networking/Internet connectivity configurations

Enclosure: II

ACTIVITY PLANNER
Gauhati University Institute of Distance and Open Learning
Guwahati- 781014, Assam

ADMISSION			
SEMESTER (TRADITIONAL PROGRAMMES)			
A	1	Fresh	July-September
	2	Continuation	July-September
SEMESTER (IT PROGRAMMES)			
B	1	Fresh	July-September
	2	Continuation	Odd Semester (July-September)
			Even Semester (January-February)
ADMISSION TEST FOR M.Sc. IT PROGRAMME			
C	August		
ANNUAL PROGRAMMES			
D	1	Fresh	July-September
	2	Continuation	July- September
DISTRIBUTION OF SLM			
SEMESTER/ANNUAL (TRADITIONAL PROGRAMMES)			
A	1	Fresh	July-September
	2	Continuation	July-September
SEMESTER (IT PROGRAMMES)			
B	1	Odd Semester	July-September
	2	Even Semester	January-February
CONTACT CLASSES			
SEMESTER (TRADITIONAL PROGRAMMES)			
A	1	Odd Semester	September-December
	2	Even Semester	March-June
SEMESTER (IT PROGRAMMES)			
B	1	Odd Semester	September-December
	2	Even Semester	March-June
ANNUAL PROGRAMMES			
C	1	Previous/Final	December-May
EXAMINATION : TERM END			
SEMESTER (TRADITIONAL/IT PROGRAMMES)			
A	1	Odd Semester	February-March (All Sundays)
	2	Even Semester	August-September (All Sundays)
ANNUAL PROGRAMMES			
B	1	Previous	August-September (All Sundays)
	2	Final	February-March (All Sundays)
	Schedule may change as per the directive of the Controller of		

		Examinations, GU/Govt. of Assam	
EXAMINATION: Sessional (OMR based Internal Examination)			
SEMESTER (TRADITIOANL/IT PROGRAMMES)			
A	1	Odd Semester	November-December
	2	Even Semester	June-July
ANNUAL PROGRAMMES			
B	1	Previous	June-July
	2	Final	November-December
DECLARATION OF RESULTS (Term End)			
SEMESTER (TRADITIONAL/IT PROGRAMMES)			
A	1	Odd Semester	May-June
	2	Even Semester	November-December
ANNUAL PROGRAMMES			
B	1	Previous	November-December
	2	Final	May-June

ENCLOSURE-III
SLM covering syllabus

Sl. No.	Semester	Paper No.	Paper Name
1	I	IT 01	Fundamentals of Computers
2		IT 02	Introduction to Programming
3		IT 03	Digital Logic
4	II	IT 06	Programming in C++
5		IT 07	Database Management System
6		IT 08	Computer Network and Internet