NEW SCHEME FOR POST GRADUATE DIPLOMA IN COMPUTER SCIENCE AND APPLICATIONS (PGDCSA) COURSE

SEMESTER - I (PGDCSA) Applicable From July 2018 onwards

Sr. No.	Subject No.	Name of the Subject	Teaching Scheme: Theory Hr	Tuto Hr.	Pract. Hr.	Examination Scheme: Sessional M.	Sessional Hr.	Theory M.	Theory Hr.	Pract. M	Pract. H	T.W. Marks	Total
1.	PGDCSA111	FUNDAMENTALS OF PROGRAMMING	4	-	4	25	2	50	3	50	3	25	150
2.	PGDCSA112	FUNDAMENTALS OF COMPUTERS & OFFICE AUTOMATION TOOLS	4	-	4	25	2	50	3	50	3	25	150
3.	PGDCSA113	INTERNET TECHNOLOGY AND WEB DESIGN	4	-	4	25	2	50	3	50	3	25	150
4.	PGDCSA114	RELATIONAL DATABASE MANAGEMENT SYSTEMS	4	-	4	25	2	50	3	50	3	25	150
		T O T A L	16	-	16	100	-	200	-	200	-	100	600

NEW SCHEME FOR POST GRADUATE DIPLOMA IN COMPUTER SCIENCE AND APPLICATIONS (PGDCSA)COURSE

SEMESTER - II (PGDCSA) Applicable From December 2018 onwards

Sr. No.	Subject No.	Name of the Subject	Teaching Scheme: Theory Hr	Tuto Hr.	Pract. Hr.	Examination Scheme: Sessional M.	Sessional Hr.	Theory M.	Theory Hr	Pract. M	Pract. H	T.W. Marks	Total Marks
1	PGDCSA121	Computer Based Accounting System	4	-	4	25	2	50	3	50	3	25	150
2	PGDCSA122	Fundamentals of Computer Networking	4	-	0	25	2	50	3	-	-	25	100
3.	PGDCSA123	GUI programming using Object Oriented Concepts	4	-	4	25	2	50	3	50	3	25	150
4	PGDCSA124	Web Application Development using FOSS	4	-	4	25	2	50	3	50	3	25	150
5.	PGDCSA125	System Analysis and Design	4	-	0	25	2	50	3	-	3	25	100
6.	PGDCSA126	SYSTEM DEVELOPMENT PROJECT	-	-	30	-		-		200	-	150	350
		T O T A L	20	0	42	125	-	250	-	350		275	1000

Course Name: Fundamentals of Programming

Course Code: PGDCSA111

Objectives:

The aim of this course is to introduce the rudiments of programming to the students. Students will become familiar with problem solving techniques and algorithm development using computers. This will include structured programming using C, a high-level programming language.

Prerequisites: None

Contents:

1. **Introduction:**
   Concepts of Algorithm and Flowcharts, Process of compilation, Overview of programming languages

2. **Basics of C:**
   Basic features of C Language like Identifier, Keywords, Variable, data types, Operators and Expression. Basic screen and keyboard I/O

3. **Control Statements:**
   Test Conditions, Conditional execution and selection, Iteration and Repetitive Executions, Nested loops.

4. **Arrays:**
   Introduction to contiguous data types. One dimensional arrays, multidimensional arrays, Array as strings, multidimensional character arrays. Operations on strings.

5. **Functions:**
   Concept of modular programming, Using functions, Scope of data, Recursive functions. Command line arguments.

6. **Pointers:**
   Need of pointer, Types and uses of pointer, Array and Pointers, Pointers and strings, Pointer to Pointer, Pointers and functions, other aspect of pointers, Dynamic Memory Allocation

7. **User Defined Data Types:**
   Introduction to structures, usage of structure, nested structures, Union and its usage, Enumeration types, bit fields.

8. **Files:**
   Types of files, working with files, usage of file management functions.

9. **Other features of C:**
   Bitwise operators and its usage, C Preprocessor statements.

Main Reference Book(s):

[1] P. Dey and M. Ghosh, *Programming in C*, Second edition. Oxford, 2011.

Suggested Additional Reading :

[1] B. A. Forouzan and R. F. Gilberg, *Computer Science: A Structured Programming Approach Using C*. New Delhi: CENGAGE LEARNING.
[2] Y. Kanetkar, *Let Us C*, BPB Publications.
[3] Y. P. Kanetkar, *Let us C Solutions*, BPB Publications.
[4] K. R. V. S. R. Prasad, *Mastering C*, Second edition. McGraw Hill Education.
[5] J. R. Hanly and E. B. Koffman, *Problem Solving and Program Design in C*, Pearson International.
[6] Balagurusamy, *Programming in ANSI C*, Seventh edition. McGraw Hill Education India Private Limited.
[7] A. Kamthane, *Programming With Ansi And Turbo C*. Pearson Education.
[8] B. Gottfried, *Schaum's Outline of Programming with C*, New York: McGraw-Hill Education.

Accomplishments of the student after completing the Course:

After completion of the course students should become reasonably good at problem solving and algorithm development. They would become capable of solving problems using computers through C programming language.

Course Name: Fundamentals of Computers & Office Automation Tools

Course Code: PGDCSA112

Objectives:

Computers are widely and popularly used for the storage, representation, analysis and reproduction of data and thus it is important to have a thorough understanding of the various software packages available for use. The objective of this course is thus to acquaint the students with computers, its basic operating systems and Office suite of programs for effective representation and analysis of data. Students will get familiarize with the elements of Computer Organization and Architecture and will gain basic knowledge necessary to understand the hardware operations of digital computers.

Prerequisites: None

Contents:

1. **Basics of Computer & Data Representation:**
   Algorithms, Simple Model of a Computer, Characteristics of Computer, Problem solving using Computers, Representation of Characters in Computers, Concept of number system, Representation of Fractions, Integers and Hexadecimal numbers, Conversion from Decimal to Binary and Binary to Decimal, Conversion to Hexadecimal and vice-versa, Error Detecting Codes.

2. **Input/Output Units:**
   Traditional Computer Input/Output units, Modern Input/Output Units including printers plotters.

3. **Computer Memory & Processor:**
   Memory Cell, Memory Organization, Read-only memory, Serial access memory, Physical devices used to construct memory, CD-ROM, Magnetic Hard-Disk, Magnetic Tape, Memory hierarchy, Structure of instruction, Description of a processor, Machine Language program.

4. **Binary Arithmetic:**
   Binary Addition, Binary Subtraction, Signed numbers, 2's complement, Addition & Subtraction of 2's complements, Binary Multiplication, Binary Division, Floating point representation of numbers.

5. **Logic Circuits:**
   Introduction, Switching circuits, AND/OR Operations, NOT operation, Boolean functions, Postulates, Principle of duality, Theorems, Precedence of operators, Venn diagram, Truth-table, Canonical forms for boolean functions, Logic circuits, Introduction to flip-flops, Parallel and Serial adders, Physical devices used to construct Gates, Transistors, Integrated circuits.

6. **Computer Architecture & Operating Systems:**
   Interconnection of Units, Processor to Memory communication, I/O devices to processor communication, Interrupt structure, Bus Architecture of Personal computers, Multiprogramming, Overview of operating systems, types of operating systems, Case-study of MS DOS, Linux and MS Windows OS. Basic DOS Commands, Basic MS Windows Operations.

7. **Microcomputers, Generations of Computers & Classification:**
   Ideal microcomputer, Actual microcomputer, Memory system for microcomputers and minimum memory requirements, Evolution of microcomputers, Special purpose applications of microcomputers, Smart-Cards, Various generations of Computers, Classification of computers, Moore's Law, Parallel & Distributed Computers.

Practical

1. **Document Processing Software:**
   Laying out text, laying out the page, speeding text entry, quick text changes, using scroll bar, using Go To command, viewing files, techniques for entering text and graphics, finding and replacing text and other things, using textboxes, border, shading and color, creating numbered and bulleted lists, adding "text effects", creating and removing columns, working with tables, macros, using mail merge, managing footnotes and endnotes, using headers and footers, page numbering, inserting captions, forging cross-references, paragraph and character styles, creating and applying styles, constructing Word templates, using hyperlinks, table of contents and indexes, using spell check, grammar and thesaurus, object linking and embedding.

2. **Spreadsheet Software:**
   Types of data, entering, editing and erasing data, resizing rows and columns, hiding and unhiding rows and columns, formatting, auto formatting, conditional formatting, adding comments, working with ranges, working with formulas and functions, fixing formulas, evaluating formulas, entering functions, nesting functions, recording, storing and using macros, understanding data series and categories, using the chart wizard, adjusting data on charts, formatting charts, mixing different types of charts in the same chart, filtering data with auto filter and advanced filter, sorting data, working with lists, Pivot Tables and Pivot Charts, using PivotTable wizard, creating one-variable and two-variable data tables, what-if analysis using Goal Seek and Scenario, working with Add ins, protecting and unprotecting a worksheet and a workbook.

3. **Presentation Software:**
   Creating a presentation with AutoContent wizard, with a template and from scratch, inserting, deleting, rearranging and copying slides, using

numbers and bullets, customizing and sprucing up presentations by adding images, slide transitions, animation schemes, including graphs, charts, tables, columns, sound and video, creating and modifying WordArt objects, managing headers and footers, using Action buttons, using Masters like the Slide Master, Handout Master and Notes Master, creating slideshows, rearranging and hiding slides, adding comments, moving between slides, setting up the slide show, custom slide show, using recording narration, creating self-running presentations, using Pack and Go wizard, printing slides, speaker notes, handouts, and outline.

Main Reference Book(s):

1. V. Rajaraman & N. Adabala, Fundamentals of Computers, PHI, 6th Edition.
2. Online Documentation of Libre Office (http://documentation.libreoffice.org)
3. Online Documentation of MS Office (http://support.office.com)

Suggested Additional Reading :

1. Digital Computer Fundamentals, Bartee, T.C., McGraw-Hill Inc.
2. Digital Logic & Computer Design, Mano, M., Pearson Education
3. Computer Fundamentals, Sinha P.K., BPB Publications
4. Working with PC Software, Soni R.P, Arolkar H.A., Wiley India

Accomplishments of the student after completing the Course:

Students will get the knowledge of computer organization and architecture. They will know the actual working and organization of digital computer system.

Course Name: Internet Technology And Web Design

Course Code: PGDCSA113

Objective:

The goal of this course is to present overview of the Internet as a global resource for the people. The course has been designed to provide knowledge on series of Internet related activities. Students will understand the basic activities related to Internet and the basic knowledge for design of the web page / site.

Contents:

1.Introduction: Introduction, Evolution and history of Internet, Growth of Internet, Owners of Internet, Internet Services, How does the internet work, Anatomy of Internet, Internet Addressing, Internet Vs Intranet, Impact of Internet, Governance of Internet

2. Internet Technology & Protocol: ISO-OSI Reference model, TCP/IP protocol suite, Data transmission, switching, routers & gateways, network protocols

3. Internet Connectivity: Getting connected, different types of connections, Levels of Internet connectivity, Internet service provider, Internet account by ISP

4. Internet Tools and Multimedia: Current trends on Internet, Interactivity tools, multimedia and animation

5. WWW and Web Browser: www, Evolution of web, Basic elements of www, web browsers, search engines, search criteria

6. Web Publishing: Web publishing, web page design

7. HTML: HTML page structure, HTML Text, HTML lists, HTML links, HTML tables, HTML Frames, HTML Images, HTML forms, multimedia

8. CSS: Introduction to CSS, types of CSS, Style sheets with HTML, Rules, selector, declaration, property & value

9. Java Script: Introduction to Java script, variable, operators, expression, data types, array, branching statement, iterative statement, built in objects (document, data, string, window, math) and their functions, user defined functions, Objects, DOM Architecture, Events

Main Reference Books:

1. **Internet Technology and Web Designing,** by ISRD group, Tata McGraw Hill Education Private Limited

2. **Web Enabled Commercial Application Development Using HTML,Javascript,DHTML,PHP ,** Ivan Bayross, BPB Publications

Supplymently Reading:

1. HTML Black book, Steven Holzner, Kogent Learning Solutions Inc
2. Sams teach yourself HTML 4 in 10 minutes, Deidre Hayes
3. HTML4 for Dummies, Ed Tittel , Mary Burmeister,Wiley
4. Programming the World Wide Web ,Robert Sebesta, Pearson Education Inc.
5. Internet and World Wide Web How to Program, Deitel,Pearson
6. Murach's HTML, XHTML and CSS, Anne Boehm, Murach's/O'reilly
7. Head First HTML and CSS, Elisabeth Robson, Eric Freeman,O'Reilly
8. HTML and CSS The Complete Reference ,Thomas Powell, , McGrawHill Education India
9. Beginning HTML, XHTML, CSS and Java Script,John Duckett, Willy India
10. http://www.w3schools.com/

At the end of the course the students will be able to:

- Effectively use the Internet for both information retrieval and data transfer.
- Understand the client server relationships between Web servers and Web browsers.
- Understand the domain name concept and services, Internet addressing and URL's.
- Setup Internet network platforms.
- Plan and manage the back-end infrastructure of a small-to medium-size Web site.
- Be in a position to search for information on the Internet, read and send emails and communicate effectively over the Web
- Design a simple web page using Hypertext Markup Language (HTML).
- Learn the use of CSS to design website and
- Learn Java Script for website design.
- Be able to design simple websites

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Course Name: Relational Database Management Systems

Course Code: PGDCSA114

Objectives: This course is an introduction to concept of Database Management system. This course helps students understand the preliminaries of Database Management System, concepts and its applications

Contents:

1. Introduction:

Basic Concepts: data, database, database systems, database management system, Role and advantages of Database management system (over file systems) , Types of Databases ,Evolution of File system data processing , Structural and Data Dependence, Data Anomalies , Database System Environment , DBMS Functions.

2. Data Modeling/Conceptual Design

Data models: Introduction, Importance of Data Model , Data model basic building blocks, Business Rules, Evolution of different Data Models ,Emerging Data Models , Degrees of Data Abstraction , External Model , Conceptual Model , Internal Model , Physical Model ,
Conceptual Design : Entity sets, attributes and keys, Types of entities, Relationships (ER) and Types of relationships, Database modeling using entity and relationships, Enhanced entity-relationship diagrams:

3. Relational Data Model / ERM

Logical View of Data , Keys, Dependencies , Functional Dependencies, Types of Keys , Integrity Rules , Relational Algebra , Relational Set Operators Data Dictionary and System Catalogue , Relationships (1:M , 1:1 , M:N) , Codd's Rules.
ERM: Entities , Attributes , Types of attributes , Chen model , Crow Foot model, Relationships , Connectivity and Cardinality , Relationship Degree , integrity constraints, referential integrity constraints , Dependencies , Relationships., Developing Diagrams , Advanced Data Modeling : Extended ER model : Generalization-Specialization, Inheritance , Subtype , Disjoint Entity Integrity , When to use which keys , Flexible Database Design

4. Normalization of Database Tables

Need for Normalization , Normalization Process (First Normal Form , Second Normal Form , Third Normal Form) , Functional Dependency concepts , Stages of Normalisation: 1NF ,2NF ,3NF, BCNF (with general definition also) and Multi-valued Dependency : 4NF & 5NF(Project Join NF) Conversions of different normal forms , Design improvement and key considerations , Higher Normal Forms (BCNF , 4NF , 5NF) , Denormalization.,

5. Introduction to Structured Query Language (SQL)
Introduction to SQL, Data Definition Language (DDL) commands, Database Model , Database Schema , Data Types , Constraints , Creating Tables , Data Manipulation Language(DML) , Select Queries , Logical Operators , Special Operators , Advanced Data definition ,Data modification and Select , Agreegate functions , Grouping Data , Joins , Subquery

Main Reference Book(s):

1.Database Systems : Design, Implementation , and Management 12e , Carlos Coronel , Steven Morris , Cengage Learning Mc-Graw Hill.
2. MySQL – MySQL 5 for Professionals , Ivan Bayross

Suggested Additional Reading:

1.Database Management Systems, Ramakrishnan, Gehrke, Third edition, McGraw Hill.

2.Database Systems: Concepts, Design and Applications, Pearson Education, S.K.Singh.

Chapter wise Coverage from the main reference book(s):

Book No. 1 : Chapters 1,2,3,4,5,6,7
Book No. 2 : Chapters 4,5,6,7,8,9,10,12,13,14,15,16

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Regulations for the Postgraduate Diploma in Computer Science & Applications (PGDCSA) (New Course) w.e.f. academic year 2018-19

R. PG DCSA 1 :

Candidates for admission to the 1 - Year Postgraduate Diploma in Computer Science & Applications (PGDCSA) course must have passed a Bachelor's degree examination under (10+2+3) pattern either in science or commerce or management or social science or engineering (including technology) or equivalent obtained at the University examination of this University or any other examination recognized as equivalent thereto by this University. Under Social Science all Arts graduates except those having graduated with languages as major subjects will be considered eligible for admission.

R. PGDCSA 2 :

Examination for the PGDCSA course will be conducted under the Semester System. For this purpose, each academic year will be divided into two semesters.

R. PGDCSA 3 :

A candidate who has passed an equivalent examination from any other University or examining body and is seeking admission to the PGDCSA course shall not be admitted without producing the Eligibility Certificate from the Gujarat University.

R. PGDCSA 4 :

No candidate will be admitted to any semester examination for PGDCSA unless it is certified by the designated authority which is the Head of the University Department:

(1) That he/she has attended the course of study to the satisfaction of the designated authority.

(2) That he/she has maintained a good conduct and character during the studies.

R. PGDCSA 5 :

Candidates desirous of appearing at any semester examination of the PGDCSA course must forward their applications in the prescribed form to the Registrar, through the designated authority on or before the prescribed date.

R. PGDCSA 6 :

For any semester the maximum marks for the internal and external assessments shall be shown in the teaching and examination scheme. For the purpose of internal assessment, sessional tests or any other suitable methods of assessment may be used by a department. When two tests are conducted, the maximum of the marks obtained in the two tests in each subject may be considered.

R. PGDCSA 7 :

A candidate, who has registered for the first semester examination will be permitted to prosecute his/her study for the second semester.

R. PGDCSA 8 :

No candidate will be allowed to reappear in a semester examination in which he/she has already passed. However, a candidate having ATKT will have the option to either reappear in all the subjects or to reappear in only the subjects in which he/she has failed.

If such a candidate exercises the option to reappear in all the subjects, the marks obtained by him/her in the theory and practical/viva examinations at the earlier examinations at the same semester will stand extinguished.

R. PGDCSA 9 :

(i) To pass a subject in any semester a candidate must obtain a minimum of 40% of marks in each head of the subject and thus minimum of 40% of the aggregate of the subject. When a candidate has failed in a subject, the marks in the sessional and term work head will be carried forward provided the candidate has secured a minimum of 40% marks in the head.

For a subject having Practical/VV as one of the heads of passing, if a candidate fails in the subject and if he/she passes in the Practical/VV head, he will have the option to either reappear in the Practical/VV examination or to allow the marks obtained in this head to be carried forward. If such a candidate exercises the option to reappear in the Practical/VV examination, the marks obtained by him/her in the same head at the earlier examinations will stand extinguished.

If a candidate fails in the subject and if he/she passes in the Theory head and fails in Practical/VV head, he/she will have the option to either reappear in the Theory examination or to allow the marks obtained in this head to be carried forward. If such a candidate exercises the option to reappear in the Theory examination, the marks obtained by him/her in the same head at the earlier examinations will stand extinguished.

For the award of class the aggregate marks will consist of the sum of the total marks of the First and the Second Semester taken together. Using the aggregate marks calculated as per above scheme a class will be awarded as follows :

(1) 70% or more marks - First Class with Distinction
(2) 60% or more marks - First Class
(3) 50% or more marks - Second Class