SNDT Women's University

Syllabus
Post Graduate Diploma
in
Computer Science and Applications (PGDCSA)

SNDT Women's University

Sir Vithaldas Thackersey Vidyavihar,

Juhu Road, Santacruz West, Mumbai 400 049.

(Applicable to students taking admission in and after 2019)

(Sem I and II: Modified on 6th July 2019 Ad-hoc BOS)

GENESIS

The SNDT Women's University, the pioneer Women's University in India, was founded on June 2, 1916 by Maharshi Karve with 5 students.

Today, the University has an enrolment of over 50000 students (including those from Junior Colleges) in the formal as well as the non-formal streams, 166 Colleges, 39 University Departments, 4 Faculties and 4 Campuses.

The pioneer Women's University has been in the service of Indian women from all walks of life in a variety of ways for the last nine decades. In its endeavor to give the best in science and technology, as well as to enhance research functions, the University established its computer center in 1985 with the assistance of U.G.C. for an 'O' level and higher level system and has a well-functioning computer center with adequate trained staff. The University was selected by the U.G.C. for conducting the Postgraduate Diploma in Computer Science and Applications (PGDCSA) in 1985 and for conducting the Master of Computer Applications (MCA), now AICTE approved, in 1989 and Master of Science in Computer Science [M. Sc. (CS)] from 2013. These courses follow the prescribed syllabus with a thrust for both theoretical computer science as well as applications.

The response to these courses conducted by the University is overwhelming. Thirty three batches of PGDCSA and twenty nine of MCA students have completed the course and are employed in India and abroad. The alumnae work for some of the best institutions in the world.

The SNDT Women's University is affirmative in its commitment to the empowerment of women through education and pursues excellence unstintingly. The University has obtained an A grade from the National Assessment and Accreditation Council (NAAC).

Vision: *Sanskrita Stree Parashakti*

An Enlightened Woman is a source of Infinite Strength

Mission: Empowerment of Women through Education

OPPORTUNITY

In the rapidly changing area of computer science and technology there is an ever-growing shortage of trained manpower required in educational institutions as well as industry. This problem has been identified as early as 1980 by Rajaraman Committee on Computer Manpower Development and has been reiterated by various panels and study groups set up by the DoE since then. In order to enable one to cope with the ever growing and fast changing technology it is essential for one to acquire appropriate formal training. India has set up priorities, made plans and visualized grand schemes to enter the information technology era, the 21st century. It is clear that this will bring about advances in technology especially in areas such as electronics, space research, biomedical engineering, computer science, communications and genetics.

Computer science is both a pure science as well as an applied science, hence requires a large number of highly qualified personnel. The requirement of personnel can be identified to be in the following sectors viz. manufacturing and maintenance of computer, computer users such as industry and data center, government departments, educational and research organizations, national projects such as that of railways and defense and the growing area of software export.

Computer software development is also a profession particularly suitable for women. As the infra-structural facilities grow, many women will be able to work from their homes, meeting the needs of both the home and the job. This department has so far trained over 755 PGDCSA students and about 946 MCA's who are well placed around the globe. We shall not let any opportunity pass lest they may never come back. The department is proud of its students and its own performance during the last 34 years.

POSTGRADUATE DEPARTMENT OF COMPUTER SCIENCE

The Shreemati Nathibai Damodar Thackersey (SNDT) Women's University Post-Graduate Department of Computer Science offers three courses at the post-graduate level, Master of Computer Applications (MCA – 3 years, full-time), Master of Science (Computer Science) (M.Sc.(CS) – 2 years, full-time) and Post Graduate Diploma in Computer Science and Applications (PGDCSA – 1 year, full time). SNDT admits candidates to MCA based on performance in the state level entrance examination conducted by Directorate of Technical Education (DTE), subject to the eligibility criteria set by DTE. Admission to the PGDCSA course is given by the P.G. Department of Computer Science directly.

1. **Objectives**
   - To provide technical education to women to catalyses their empowerment.
   - To fulfill the national need for trained teachers and researchers in Computer Science.
   - To promote advanced research, doctoral and postdoctoral work.
   - To support the efforts of the University to promote computer awareness and utilization in the various departments.

2. **Major Thrust Areas**
   - Train highly competent computer software professionals needed by the industry.
   - Strengthen teaching, research and consulting in the area of computer applications.
   - Develop software for the improvement of educational testing and software for students with learning disability.
   - Promote teaching materials and manpower for computer science education.
   - Participate actively in professional bodies and industry to contribute to the society at large.
   - Interact with some of the best in the computing profession to give exposure to students and faculty.
   - Establish links with national and international organizations for advanced training and research in computer science.

3. **Computing Facility**
   There are three computer laboratories with best hardware and latest software.

4. **Interaction with Industry and Employment**
   The Department makes consistent efforts to improve the courses to make them relevant. Various industries and Computer organizations are involved in this effort. They do so by functioning on the Department's advisory bodies. The Department gets support from industries for teaching as well. Our past students are employed in some of the finest companies in the world. Some of the students are pursuing higher studies in Computer Science, in India and abroad.

5. **Association with Research and Development Organizations**

In addition to its linkages with industry the University had signed Memoranda of Understanding with several R&D endeavours with a view to strengthening its academic programmes, and enhancing research facilities of the Department of Computer Science. The co-signatories are:

a. Centre for Development of Advanced Computing (CDAC), formerly NCST, Mumbai.

b. Nuclear Power Corporation of India Limited

c. The Tata Power Company Limited, Andheri, Mumbai

d. Renassaince Mumbai Convention Centre Hotel & Lakeside Chalet- Mumbai, Marriott Executive Apartments.

e. Safe Pvt. Ltd, Andheri(E), Mumbai

f. Selec Controls Pvt. Ltd, Mumbai

g. School of Education and Communication, Jonkoping University, Sweden The department is an institutional member of professional bodies such as Computer Society of India.

6. Research Activities

The Department is actively involved in research in the following areas:

a. Artificial Intelligence (AI)

b. Image Processing

c. Secure Communication

d. Web Technologies

e. Software Engineering and project management

f. Geographical Information System

g. Internet of Things

h. Cyber Security

i. Data Warehousing & Data Mining

j. Machine Learning

7. Self-Enrichment Courses

A series of programmes in the areas of personality development, interview techniques, communication etc. will be arranged.

8. Faculty

The Department has its own full time qualified and experienced faculties for lectures and practical. Several faculty members are actively involved in various areas of research and software development.

9. Visiting Faculty

The University has been receiving the support of research and educational institutions in Mumbai such as IIT (Mumbai), BARC, C-DAC, etc. The Department also receives support from several talented and well-experienced professionals from the Industry as visiting faculty.

10. Library

The University has excellent library facilities having about 2000 volumes of recent editions pure as well as applied computer science. The library subscribes to several leading Indian as well as

foreign journals in computer science and related areas. In order to supplement these, the department maintains an appreciable collection of books and journals that are available to the students all the time.

11. Service to other Departments

This department has played a significant role in helping other departments set up computer laboratories; conduct computer related courses and computer awareness programmes.

12. Students and Departmental Activities

13. The Department makes consistent efforts to improve the quality of the courses it conducts as well as to maintain acceptable standards. In order to develop as well as to assess the individual competence there are regular tests as well as assignments. There is a continuous internal assessment for 50marks. The end of semester examination has a weightage of 50 marks. Group work and collaborative efforts are inculcated by having departmental projects as well as by attaching a group of students to a member of the faculty for discussions, etc. The problem solving capabilities are developed and reinforced by administering aptitude tests, programming assignments and even by organizing various contests. Visits to Computer Centers and Research and Development Organizations with advanced and sophisticated facilities widen the horizon and perspective of students. Experts from Industry, Consultancies and Research Institutes are invited to give lectures on specialized topics. Efforts are made to develop leadership qualities, and other desirable personality traits through extra-curricular activities as well as workshops on personality development, problem solving, etc. Interview techniques and lectures on 'job expectations' prepare them to face the challenges of job seeking. Student participation in the running of the department is achieved by having well-functioning Students Council. There are active student chapters of the Association for Computing Machinery (ACM) and Computer Society of India (CSI). Digital library access is available to the members of the ACM. Students are involved in National Service Scheme (NSS) a community service.

14. Students Council:

Students Council Objectives:

The Students council formally represents the students and endeavors to improve the department. The council shall strive to solve the problems of students being a liaison between the students and the faculty.

Composition:

The student's council is a body composed of

The General Secretary (GS)

Two Assistant General Secretaries (AGS)

Treasurer

Eight Council Members

14.   **Extra-Curricular Activities**

The Juhu Campus of the University has excellent facilities for indoor as well as outdoor activities.

15.   **Vacation**

Students normally get Diwali, Christmas, and summer vacations as per university norms.

POST GRADUATE DIPLOMA IN COMPUTER SCIENCE AND APPLICATIONS

1.   **Broad Objectives**

The course is designed to give the students a sound background in the theory and practice of computer science. The curriculum has a combination of pure computer science subjects and applications. The students are expected to be in a position to develop computer software efficiently and independently by the end of the course.

2.   **Duration**

One year, full time   -   Two semesters
First Semester -   August to December
Second Semester   -   January to May

3.   **Eligibility**

Women graduates from a recognised university.

4.   **Selection Procedure**

Admission on first come first served basis.

5.   **Medium of Instruction and Examination**

English

6.   **Attendance**

The students are required to have 75% of attendance in each subject, failing which they will not be allowed to appear for the final examination of the semester. In case the absence is due to illness, medical certificate will have to be produced immediately for consideration.

7.   **Fee Schedule:**

PGDCSA Course: Rs. 30920/-

Note: The course fees may be revised by the University from time to time.

There will be scholarship/freeship for the reserved candidates.

8.   **Refund of Fees**

1) If a student wants to cancel the admission within 8 days of the commencement of the course, 75% of the tuition fees would be refunded.

2) If a student wants to cancel the admission after 8 days and before 20 days of the commencement of the course, 50% of the tuition fees would be refunded.

3) If a student leaves the course after 20 days of the commencement of the course, no fees will be refunded.

4) Fees other than tuition fees are not refundable.

9.   Refund of Deposit

This has to be claimed by the student, within six months of completion of the course, on presentation of the original fees and deposit receipts.

10.   Course Frame Work

(A) Semester wise Details:

PGDCSA SEMESTER-I

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
1101	Fundamentals of computer and Operating Systems	4		4	50	50	100
1102	C Programming	4	-	4	50	50	100
1103	Office Automation Tools	4	-	4	50	50	100
1104	Soft skill and Multimedia Tools for Presentation*	4	-	4	50	50	100
1201	Operating system Lab	-	2	2	25	25	50
1202	C Programming Lab	-	2	2	25	25	50
1203	Soft skill and Multimedia Tools for Presentation Lab	-	2	2	25	25	50
1204	Office Automation Lab	-	2	2	25	25	50
	Total			**24**			**600**

PGDCSA SEMESTER-II

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
2101	Object Oriented Programming using Java	4		4	50	50	100
2102	Web Technology	4	-	4	50	50	100
2103	Database Management Systems	4	-	4	50	50	100
2104	Digital marketing	4	-	4	50	50	100
2201	Java Lab	-	2	2	25	25	50
2202	Web Technologies lab	-	2	2	25	25	50
2203	Database Management Systems Lab	-	2	2	25	25	50
2104	Digital marketing lab	-	2	2	25	25	50
	Total			**24**			**600**

SEMESTER		1 Credit=25 Marks
I	II	**Total Credits = 48**
24	24	**Total Marks = 48*25=1200**

(B) Lectures per Paper

50 hours

(C) Repeating Internal Evaluation

Students who failed in the internal component of papers at PGDCSA are required to apply to the Department to enable them to reappear in the internal assessment. This application should be made within one month of the start of the semester in which the student wishes to reappear.

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All rules pertaining to A.T.K.T. and time limit to clear the backlog apply. An internal assessment fee of Rs. 500/- will be charged for each paper in which student wishes to reappear for the internal evaluation.

(D) Core Paper Assessment

Internal : 50%

External :50%

(E) Lab Component Assessment

Internal   : 50%

External : 50%

Each student has to work individually on the computer.

(F) Duration of External Examination: 2 Hours per Paper

(I) Passing Criteria

   i. 40% each in internal and external assessment

  ii. Awarding of class

40 % or above & less than 50%: Pass

50 % or above & less than 60%: Second

60 % or above & less than 70%: First

70 % or above   : First Class with Distinction

DETAILED SYLLABUS

Branch: PGDCSA		Semester-I
Subject Code: 1101		Lecture: 04 Credit: 04
Subject Title		FUNDAMENTALS OF COMPUTER AND OPERATING SYSTEMS

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
UNIT-I	1	**Computer Fundamentals:** Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation. Number System: binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions. Binary Arithmetic: Addition, subtraction and multiplication.	**4**	**5**
	2	**Output Units:** Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touch screen, OCR, OMR, MICR Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory, Floppy disk, hard disk, compact disk, tapes. Memory Input and Printers: Impact, nonimpact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer. Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.	**4**	**5**
UNIT-II	3	**Introduction to Operating Systems (OS):** Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special-Purpose Systems, Computing Environments. Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation.	5	5
	4	**Processor Management:** Process concept, Process scheduling, Operations on Processes, Interprocess Communication, Multithreading models, threading issues, Process scheduling algorithms, Thread scheduling, Multiple processor Scheduling. **Process Coordination**: Synchronization,	8	15

		Semaphores, Monitors, Deadlocks characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock detection, recovery from deadlock.		
	3	**Memory Management:** Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation **Virtual memory Management:** Demand Paging, Copy-on-Write, Page replacement, Allocation of Frames, Thrashing.	9	20
UNIT-III	4	**File Management:** File Concept, File Access Methods, Directory Structure, File Sharing, File Protection, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery, Log-Structured File Systems, NFS. **I/O Management:** I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Requests to Hardware Operations, STREAMS, Performance. **Disk Management:** Disk Structure, Disk Attachment, Disk Scheduling, Disk Management , Swap-Space Management, RAID Structure, Stable-Storage Implementation, Tertiary-Storage Structure	10	20
	5	**Distributed systems:** Types of Distributed Operating, Network Structure, Network Topology, Communication Structure, Communication Protocols, Robustness, Design Issues. **Distributed File Systems:** Naming and Transparency, Remote File Access, Stateful Versus Stateless Service, File Replication **Distributed Coordination:** Event Ordering, Mutual Exclusion, Atomicity, Concurrency Control, Deadlock Handling, Election Algorithms, Reaching Agreement	6	20

Modules	Sr. No.	Topic and Detail	No. of Lectures assigned	Marks Weight age %
UNIT-IV	6	**Protection and Security:** Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix , Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection. The Security Problem, Program Threats, System and Network Threats, Cryptography as a Security Tool, User Authentication, Implementing Security Defenses, Firewalling to Protect Systems and Networks, Computer-Security Classifications	4	10

Reference Books:
1. Abraham Silberscatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 7th Ed.John Wiley and Sons, Inc 2005.
2. Milan Milenkovic , Operating Systems Concepts And Design", Second Edition, McGraw-Hill International Editions,"
3. William Stallings, "Operating Systems: Internals and design Principles", 5th Ed Prentice Hall, 2005.
4. Andrew Tanenbaum, "Modern operating systems" 3rd Ed, Pearson Education.

Branch: PGDCSA	Semester-I
Subject Code: 1102	**Practical: 02** **Credit: 02**
Subject Title	**C PROGRAMMING**

Modules	Sr. No.	Topic and Detail	No. of Lectures assigned	Marks Weight age %
Unit - I	1	C Fundamentals C Character Set, Identifiers and Keywords under ANSI C. Data Types, Constants: int, float, double, char. Qualifiers: long, short, unsigned and signed. Escape sequences (like \n,\b etc.). Arithmetic Expressions and different built-in Operators. Pre-processor directives (like #include, #define), concept of header files, Symbolic constants, Comments, sizeof., steps involved in translation of C Program.	3	
	2	Built-in operators and function Console based I/O and related built-in I/O functions: printf(), scanf(); getch(), getchar(), putchar(), gets(), puts().	2	
	3	Decision and Case Control Structure if statement; if-else construct; use of logical operators and Compound Relational Tests; Nested if statements; The else if construct; the	2	

		relational operators; the conditional expression (ternary) operator. The Switch Statement with or without break, concept of a case label			
Unit – II	4	Loop Control Structure Concept of Loop, loops supported by 'C', concept of top tested and bottom tested loops, the for loop statement; Nested for Loop ; for loop variants; the while loop statement; simple and nested while loop, Increment/decrement operators; Use of Break and Continue; the do-while loop, comparison between for, while and do while loops.	3	
	5	Storage Classes Automatic, Register, Static (local and global), External. Scope rules. Arrays Concept of a collection, types of collections supported by 'C', Array collection and its features, concept of indexing, index variable, index type, positional value of a member of array collection, concept of dimension and size of an array, 'C' syntax for declaration of array, name of the array and its type, Referring individual elements, Entering data into an array, reading data from an array concept of Array initialization and list of initializers, size option, Bounds checking, the concept of two dimension arrays and related syntax, similarities between dimension and nesting.	6	
	6	Character Strings What are strings, standard library string functions like strlen(),strcat(), strcpy(), strcmp() etc.,similarity between string and 1-D array of char.	2	
Unit – III	7	Functions Concept of a subprogram, the interface of a subprogram, role of a interface, Arguments of a subprogram, kinds of subprograms supported by C, return statement as an interface, local variables; Default Return type and the type void; Passing values between functions through interfaces; Declaration of function type; iterative and recursive subprograms, Recursion; concept of call by value, call by reference, return and their underlying implementation should be explained, similarities.	5	
	8	Pointers Concept of Pointers, Pointer as an address variable, concept of a pointer data type and its syntax, built-in address operator, Pointers to existing variables of different data types and their uses, use of indirection operator, the name of the array as a pointer variable, Pointers and Arrays, Pointers arithmetic, use of unary operators (++, --), One Dimension Arrays and Pointer, concept of array of pointers and simple use, command line arguments for the main.	5	
	9	Structures Structure as a homogeneous and heterogeneous collection, possible applications, syntax of declaring structure, Initializing structures, structure variables, accessing structure elements using member operator, Arrays of Structures, and array as member of structure,	3	

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		conceptual difference between array and structure collection, Functions and Structures, nested structures, concept of anonymous structures and their use, Concept of self referential structure, pointer as member of structure and pointer to structure use of member selector operator(->), comparison between indirection (*) operator and member selector operator (->), structure as an argument to function and return type of a function.		
Unit- IV	10	Unions Concept of Union collection, Syntax of declaration and its use, comparison of Array, Structure and Union, array of unions and union as a member of structure, structure as a member of union and array as member of union, concept of memory saving and union, union as a generic data type, concept of anonymous union.	3	
	11	File based I/O Concept of a file, text files in 'C', concept of a predefined FILE pointer and its definition as given in header file stdio.h, meanings of different members of the structure representing FILE, Disk I/O Functions: High level file I/O or standard functions- fopen(), putc(), getc(), fclose(), fgets(),fputs(),feof(), simple file based programs 3 showing the working of different members of FILE structure.	3	
	12	Dynamic Memory Allocation and Memory functions Concept of dynamic environment as run time environment, concept of dynamic memory management, use of built-in dynamic memory management tools of 'C' viz. malloc(), free(), simple programs using malloc() and free()	2	

References :

1. Let us C by Yashwant Kanetkar

2. C Programming by Balgurusamy

3. Turbo C/C++ - The Complete Reference by H. Schildt.

4. Programming in C by S. Kochan.

5. Born to code in C by H. Schildt.

6. C Programming by Kerninghan and Ritchie - 2nd Edition.

7. Programming in ANSI C by Agarwal C Programming with Problem Solving by Jacqueline A Jones, Keith Harro

Branch: PGDCSA	Semester-I
Subject Code: 1103	Practical: 02 Credit: 02
Subject Title	**OFFICE AUTOMATION TOOLS**

Modules	Sr.No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
UNIT-I	1	Concept of Office Automation Purpose of an office, activities in an office ,structure of an office, office manual, document flow management in an office, need for office automation and its advantages and disadvantages, Office automation tools. Office Automation Technology: Office equipment, Workstation communication and convergence of technologies.	6	25
UNIT-II	2	Writer -Introducing Writer -Working with Text - Formatting Pages - Printing, Faxing, Exporting, and E-mailing - Introduction to Styles - Working with Styles - Working with Graphics - Working with Tables - Working with Templates in Writer - Using Mail Merge - Creating Tables of Contents, Indexes, and Bibliographies - Working with Master Documents - Working with Fields - Using Forms in Writer- Customizing Writer.	8	25
UNIT-III	3	Calc Introducing Calc, Entering, Editing, and Formatting Data, Using Charts and Graphs, Using Styles and Templates, Using Graphics in Calc, Printing, Exporting, and E-mailing, Formulas and Functions, Using the DataPilot, Data Analysis, Linking Calc Data, Sharing and Reviewing, Calc Macros	10	25
UNIT-IV	4	Impress Guide Introducing Impress, Using Slide Masters, Styles, and Templates, Adding and Formatting Text, Adding and Formatting Pictures, Managing Graphic Objects, Formatting Graphic Objects, Spreadsheets, Charts, and Other Objects, Slides, Notes, and Handouts, Slide Shows: Transitions, Animations, Printing, E-mailing, Exporting, and Saving Slide Shows, Setting Up and Customizing Impress	10	25

Reference Books:

Reference Books 1. http://www.openoffice.org/ 2. https://wiki.openoffice.org/wiki/Documentation

Branch: PGDCSA	Semester-I
Subject Code: 1104	Lecture: 04 Credit: 04
Subject Title	SOFT SKILL AND MULTIMEDIA TOOLS FOR PRESENTATION

Modules	Sr.. No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
UNIT-I	1	To improve the vocabulary of English and competency for business English. Use of language lab / English learning tools such as mobile apps like Sling etc Oral and Non verbal communication. Presentations: Preparing successful presentations, Planning for audience Making effective use of visual aid, Delivering presentation, using prompts, dealing with questions and interruptions, Mock presentations. Effective usage of Tools (MS PowerPoint) Interview preparations: Types of questions, facing interviews, reviewing performance Participating in mock interviews	12.5	25
UNIT-II	2	Content Management And Disseminations E-learning – Models WBT, CBT, Virtual Campus, LMS & LCMS, Video Conferencing, Chatting Bulleting, Building Online Community, asynchronous/ Synchronous Learning, Case Study	12.5	25
UNIT-III	3	Creating contents using PowerPoint Presentation, Flash, Adobe Photoshop, Adobe Presenter 9 , Open Source Tools- like Prezi, Empressr, Present.me	12.5	25
UNIT-IV	4	Creating Online Courses Using Moodle Planning and designing online training materials, Installing the Moodle LMS platform software, Adding media features to online courses, Each learner will be responsible to creating on online course with explores a subject area and offer features like automatic quizzes and tests, topic discussion areas, media players, etc	12.5	25

Reference Books:

1. Careers in Information Technology By Christine Wilcox

2. Speaking English Effectively - Krishna Mohan/N.P.Singh-Macmillan

3. English Conversation Practice - Grant Taylor-The McGraw-Hill Companies

4. Business Communication ByAshaKaul, Prentice- Hall of India, Pvt.Ltd, New Delhi.

5. Developing Communication skills By Krishna Mohan/MeeraBanerji, Macmillan India Ltd.

6. Communication Skills By LeenaSen-PHI Learning PvtLtd.New Delhi

Branch:PGDCSA	Semester-I
Subject Code: 1201	Practical: 02 Credit: 02
Subject Title	OPERATING SYSTEM LAB

Modules	Sr. No:	Topics and Details	No: of lectures assigned	Marks Weight age %
UNIT-I	1	Installation of OS on Virtual Machine (VM, OracleBOX etc) **File Commands:** ls, cp, mv, rm, ln, cd, mkdir, rmdir, chown, chgrp, chmod, gzip, tar, updated, find. **Commands to Access File Contents:** cat, less, diff **File Systems: Mount, umount** **System Commands:**System Information:df, du , free, date	2	5
	2	**Processes:** top, ps, kill, killall **Network:** ping, nslookup, telnet Other: IOSTAT, SAR, Pstat, Netstat command and its parameters.	3	
UNIT-II	3	**The grep Family:** The grep Command, grep Examples with Regular Expressions, grep with Pipes, grep with Options, egrep (Extended grep), Fixed grep or Fast grep	5	20
UNIT-III	4	**Introduction to UNIX Shells:** Definition and Function, System Startup and the Login Shell, Processes and the Shell, The Environment and Inheritance, Executing Commands from Scripts. The Interactive Bourne Shell, The C Shell, The Korn Shell, The Interactive bash Shell Regular Expressions, Combining Regular Expression Metacharacters	5	5
UNIT-IV	5	**Programming with the bash Shell:** Introduction Section, Reading User Input, Arithmetic, Positional Parameters and Command Line Arguments, Conditional Constructs and Flow Control Section, Looping Commands, Functions Section , Trapping Signals, Debugging, Processing Command Line Options with getopts, The eval Command and Parsing the Command Line, bash Options, Shell Built−In Commands.	10	20

Reference Book:
1. "Unix Shell by Examples" 4th Edition, Ellie Quigley, Pearson Edition
2. "Sed&Awk", 2nd Edition, Dale Dougherty and Arnold Robbins
3. "Introduction to Unix and Shell Programming", Pearson Education, M.G. Venkateshmurthy

4. Advanced Linux Programming, Mark Mitchell, Jeffrey Oldham, and Alex Samuel, New Riders Publishing
5. Unix/Linux Programming by SumitabhaDass, PHP

Branch: PGDCSA	Semester-I
Subject Code: 1202	Practical: 02 Credit: 02
Subject Title	C Programming LAB

Modules	Sr. No:	Topics and Details	No: of hours assigned	Marks Weight age %
UNIT-I	1	Control Statement: Selection Statements, if , Nested if, The if-else-if, The ? alternative, The Conditional, Expression, switch, Nested switch, Iteration Statements-The for loop, . The while loop, The do-while loop,Jump Statements- The goto& label ,The break & continue, The exit() function	1	02
UNIT-II	2	Pointers: The basics of Pointer, The Pointer operator, Application of Pointer,Pointer Expression, Declaration of Pointer, Initializing Pointer, De-referencing, void Pointer, Pointer Arithmatic,Precedence of &, * operators, Pointer to Pointer, Constant Pointer, Array & String , Single Dimension Arrays, Accessing array elements, Initializing an array, Multidimension Arrays, Intializing the arrays, Memory Representation, Accessing array elements, Passing Single Dimension array to Function.	2	12
	3	Array & Pointer , Array of Pointer , String Manipulation Functions, Function, Introduction, Arguments & local variables, Returning Function Results, Call by reference & Call by value, Recursion	4	
UNIT-III	4	Storage Classes: Automatic Storage Class, Extern Storage Class, Static Storage Class, Register Storage Class	2	12
	5	Structure ,Union, Enumeration &typedef: Structures, Declaration and Initializing Structure , Accessing Structure members, Structure Assignments, Arrays of Structure , Passing Structure to Function, Structure Pointer, Unions.	4	
UNIT-IV	6	File handling: Defining & Opening a File, Closing a File, Input/Output Operations on Files	4	24
	7	Error Handling During I/O, Operation, Random Access To Files, Command Line Arguments. Bitwise Operator: Bit Fields and simple arithmetic Operations	4	

8	Graphics In C: Drawing Object in C, Line , Circle , Rectangle , Ellipse, Changing Foreground & Background, Filling Object by Color	4	

Branch: PGDCSA	Semester-I
Subject Code: 1203	**Lecture: 02** **Credit: 02**
Subject Title	**Soft skill and Multimedia Tools for Presentation Lab**

Interviews: Preparing resumes & CV-Covering letter (effective usage of MSWord) Self introduction during interviews Interviews – Types of Interviews, preparing for interviews (Opening, body-answer Q, close-ask Q

– Group Discussion Team building, Team briefing, Role of Team leader, Conflict resolution, Methodology of Group discussions, Role Functions in Group Discussion, Improving group performance, Mock group discussions

Branch: PGDCSA	Semester-I
Subject Code: 1204	**Lecture: 02** **Credit: 02**
Subject Title	**Office Automation Tools Lab**

Guidelines: Lab exercise on Writer, Calc and Impress Guide. Students have to study and analyze the existing Office automation tools (office equipment, hardware and software) available present comparative analysis.

Semester-II

Branch: PGDCSA	Semester-II
Subject Code: 2101	Lecture: 04 Credit: 04
Subject Title	**OBJECT ORIENTED PROGRAMMING USING JAVA**

Modules	Sr. No.	Topic and Details	No. of lectures assigned	Marks Weightage
UNIT-I	1	Introduction to Applet and Swing – Creating Applet in Java, Identifying various stages of an Applet life Cycle, various Graphic method in java, the AWT control components, the Swing component class Hierarchy, using top level swing containers , using intermediate level swing containers, using the atomic component, using the Layout Manager, Flow Layout Manager, Border Layout Manager and Grid Layout Manager.	6	12
	2	Introduction to Event Handling – Identifying the source of Event, Event Listeners and Event Handlers, the Delegation Event Model, Event classes, Event Listener Interface, Action Listener interface, MouseListener Interface Adapter classes- the Mouse Adapter class, the MouseMotion Listener Interface.	10	20
UNIT-II	3	Introduction to JDBC – What is JDBC. Database connectivity , JDBC Architecture, JDBC drivers, Using JDBC API – Loading a Driver, connecting and executing JDBC statement, Handling SQL Exceptions. Accessing Result Sets, method of Result Set interface, Methods of PreparedStatement interface , retreving row, inserting row, Managing Database Transactions, creating and calling stored procedures in JDBC, using Metadata in JDBC.	12	24
UNIT-III	4	Introduction to JavaBean – javabean concept, software components and javabeans , elements of javabeans, javabean component specification, services of javabean components, types of javabean. Beans development kit, user defined javabeans, creating javabean Applet using BDK, types of javabean properties creating custom Events, Event class, EventListener, Event Handler.	12	24

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weigh tage
UNIT-IV	5	RMI – Overview of distributed Application , Remote Method Invocation, components of RMI application , RMI architecture, RMI Packages, Distributed Garbage collection, creating Distributed application using RMI, creating remote interface, implementing remote interface, creating RMI server, creating RMI client, Running the RMI application, Transmitting files using RMI , client side callbacks.	10	20

Reference Books:

1. Java^{TM} 2 : The Complete Reference, Third Edition, by Patrick Naughton and Herbert Schildt, Tata McGraw Hill Edition 1999.
2. Java Enterprise in a Nutshell : A Desktop Quick Reference(Nutshell Handbook) or any other book with similar contents.
3. mastering Java2 J2SE1.4 by John Zukouski PBP Publication
4. JavaTM How to Program sixth Edition By H.M Deitel, P.J. Deitel
5. Core Servlets & JavaServer Pages By Marty Hall, Larry Brown

Branch: PGDCSA	Semester-II
Subject Code:2102	Lecture:04 Credit:04
SubjectTitle	WEB TECHNOLOGY

Modules	Sr. No.	Topic andDetails	No of Lectures Assigned	Marks Weigh tage
UNIT-I	1	**Introduction to Web Technologies:** Concepts of Internet, Concepts of World Wide Web, Internet based Services-Email, Telnet, FTP, WWW. Web Server, Web Hosting, DNS, SMTP.	4	25
	2	**HTML:** Introduction to HTML, Structure of HTML document, Basic HTML tags, attributes, Formatting tags, Meta Tags, Comments, Inserting Image, Image Maps, hyperlink, Tables, Lists, Frames, iframes, Marquee. HTML Form controls. Introduction to HTML5.	6	
	3	**CSS:**Introduction to CSS, Types of CSS-Embedded Stylesheet, Inline Stylesheet, External StyleSheet, CSS Border, margin, Positioning, color, text, link, background, list, table, padding, image, display properties, Use of Id & classes in CSS ,use of <div>&<span> in CSS, Introduction of CSS3 : Gradients, Transitions, Animations, multiple columns.	6	

Unit-II	4	**XML:** Introduction to XML, Valid and Well-Defined Document, Document Type Definition or DTD, uses of DTD, XML Tags, Elements, Attributes, PCDATA, CDATA, Basics of entities, XML Elements , Elements Declaration, usage of #REQUIRED , usage of #IMPLIED, usage of #FIXED, Internal Entities, External Entities, XML Schema, Defining, Accessing XML Document.	6	25
	5	**Clint Side Scripting Language: Javascript** Introduction to javascript, Variables, identifiers constants in javascript, Types of Operators in javascripts, Control and looping structure,arrays in JavaScript, Event handling in javascript, JavaScript Objects-Number, Boolean, Strings, Arrays, Date, Math, Regular Expression, JavaScript Document Object Model (DOM), Window Object, Navigator Object, Location Object, History Object . Validations in JavaScript.	10	
Unit-III	6	**Server Side Scripting Language: PHP** Configuration and Installation of PHP, Variables Types, Constants, Types of Operators, Arrays, Strings, Decision and Looping Statements. Processing HTML form using GET, POST, REQUEST, SESSION, COOKIE variables, Sending E-mail, Database Operations with PHP, Connecting to My-SQL, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables. CMS: Wordpress	10	25
Unit-IV	7	Introduction to CGI Programming, JSP, Servlet, AJAX.	8	25

Reference Books:

1. Beginning Web Programming with HTML, XHTML, CSS & JavaScript by JonDuckett,Wrox.
2. Webmaster in a Nutshell by Stephen Spainhour, O'Reilly andAssociates.
3. JavaScript: The Definitive Guide by David Flanagan, O'Reilly andAssociates.
4. Beginning ASP 3.0 by David Buser and Others,Wrox.

Branch: PGDCSA			Semester-II	
Subject Code: 2103			Lecture: 04 Credit: 04	
Subject Title			DATABASE MANAGEMENT SYSTEMS	

Modules	Sr. No.	Topic and Detail	No. of Lectures assigned	Marks Weight age %
UNIT-I	1	**Introduction :** Database System Applications ,Database Systems versus File Systems, View of Data, Data Models, Database Languages, Database Users and Administrators, DBA Roles and activity, Database System Structure	2	20
	2	**Entity –Relational Model :** Basic Concepts, Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features, Design of E-R Database Schema, Reduction of an E-R Schema to Tables.	2	
	3	**Relational Model :** Structure of Relational Databases, Relational Algebra, Tuple Relational Calculus, Domain Relational Calculus	4	
UNIT-II	4	**SQL :** SQL commands, Functions, Data Constraints, Grouping Data, Subqueries, Joins, Performance Tuning, Security Management, PL/SQL, Triggers.	8	15
	5	**Integrity & Security :** Domain Constraints, Referential Integrity, Assertions, Triggers, Privileges in SQL.	4	
	6	**Relational Database Design :** Functional Dependencies, Decomposition, Normalization – 1NF – 5NF , BCNF	4	
UNIT-III	7	**Storage & File Structure :** RAID , Improvement of Reliability & Performance Indexing & Hashing – Basic Concepts, Ordered Indices, B+ & B Tree Index Files, Static & Dynamic Hashing , Comparison of Ordered Indexing & Hashing.	8	15
	8	**Transactions:** Transaction Concept & State, Implementation of Atomicity & Durability, Serializability, Recoverability, Testing for Serializability.	4	20
UNIT-IV	9	**Concurrency Control:** Protocols- Lock Based, Timestamp-based, Validation Based, Deadlock Handling & Concurrency	4	15
	10	**Recovery System :** Failure Classification, Storage Structure, Recovery & Atomicity, Log based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer management, failure with loss of nonvolatile storage, advanced recovery techniques.	4	

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
	11	**Object – Oriented Databases :** New Database Applications, Object – Oriented Data Model, Object-Oriented Languages, Persistent Programming Languages, Persistent C++ Systems	4	10
	12	**Introduction, Overview of NoSQL Databases** –Four Types of NoSQL (Document-oriented, KeyValue Pairs, Column-oriented and Graph).	2	5

Reference Books:
1. Database System Concepts : Henry Korth, Silberschatz, Sudarshan 5th Edition, McGraw-Hill
2. Fundamentals of Database Systems: Elmasri&Navathe 3rd Edition , Pearson Education India, 01-Sep-2008 - 1168 pages
3. Database Management Systems; Raghu Ramakrishnan, Johannes Gehrke; McGraw-Hill International Edition, 2002 edition
4. Modern Database Management (Seventh Edition); Jeffrey A. Hoffer, Mary Prescott, Fred McFadden; Prentice Hall, 2004
5. Database systems: Design, Implementation and Management; Peter Rob, Carlos Coronel; Thomson Publication, 2004
6. Database Processing: Fundamentals, Design, Implementation (tenth Edition); D. M. Kroenke; Prentice-Hall, 2005
7. Data Base Principles Programming Performance (Second Edition); Patrick O.Neil; Morgan Kaufmann Publishers, Inc., 2000
8. Oracle 8i PL/SQL Programming : Scott Urman

Branch: PGDCSA	Semester-II
Subject Code: 2104	Lecture: 04 Credit: 04
Subject Title	DIGITAL MARKETING

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
UNIT-I	1	**Introduction to Digital Marketing**: what is digital marketing, and importance of digital marketing. Website introduction and levels of web site, Difference between blog, portal & website. Digital marketing Introduction difference between Digital Marketing and traditional marketing, ROI between Digital and traditional marketing, Discussion on Ecommerce, Discussion on new trends and current scenario of the world, Digital marketing a boon or a Bane, Digital marketing a tool of success for companies, Video on importance of digital marketing, Analysis of recent info graphics released by companies about digital marketing? How did digital marketing help the small companies and top inc, Categorization of digital marketing for the business,	12.5	25

		Diagnosis of the present website and business. Swot analysis of business, present website and media or promotion plan, Setting up vision, mission, and goals of digital marketing.		
UNIT-II	2	Understanding a website, What is a website, Levels of websites, Diff b/w Blog, Portal and Website, Diff b/w websites either static or dynamic Module **Search Engine Optimization (SEO):** Introduction to SEO (Search engine Optimization, what is On page optimization, Off page optimization, On page optimization techniques, Off page an Optimization technique, Reports.	12.5	25
UNIT-III	3	**Social Media Optimization (SMO):** In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization, Introduction to social Media Marketing, Advanced Facebook Marketing, Word Press blog creation, Twitter marketing, LinkedIn Marketing, Google plus marketing, Social Media Analytical Tools.	12.5	25
UNIT-IV	4	**Search Engine Marketing**: In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all. ϖ Introduction to Search Engine Marketing , Tools used for Search engine Marketing , PPC /Google Adwords Tool , Display advertising techniques , Report generation.	12.5	25

Reference Books:

1. Digital Marketing for Dummies By Ryan Deiss and Russ Hennesberry, 2017
2. For recommended SEO books, see my Best SEO Books post.
3. Don't Make Me Think Revisited: A Common Sense Approach to Web Usability By Steve Krug
4. Google Adwords for Beginners: A Do-It-Yourself Guide to PPC Advertising
5. Introduction to Programmatic Advertising By DominikKosorin, 2016
6. Blogging: A Practical Guide to Plan Your Blog: Start Your Profitable Home-Based Business with a Successful Blog by Jo and Dale Reardon, 2015
7. Email Persuasion: Captivate and Engage Your Audience, Build Authority and Generate More Sales With Email Marketing By Ian Brodie, 2013
8. Social Media Marketing All-In-One for Dummies By Jan Zimmerman and Deborah Ng, 2017

Branch: PGDCSA	Semester-II
Subject Code: 2201	Practical: 02 Credit: 02
Subject Title	JAVA LAB

Modules	Sr. No:	Topics and Details	No.of Lectures/ Practicals assigned	Marks Weight age
UNIT-I	1	Class	2	04
	2	Function Overloading	4	18
	3	Operator Overloading	5	
UNIT-II	4	Polymorphism	5	16
	5	Java Beans	3	
UNIT-III	6	JDBC	2	12
	7	RMI	2	
UNIT-IV	8	Animation	2	

Branch: PGDCSA	Semester-II
Subject Code: 2202	**Lecture: 04** **Credit: 04**
Subject Title	**WEB TECHNOLOGY LAB**

List of Practical

(i)   Install the following on the local machine
- Apache Web Server
- Tomcat Application Server locally
- Install MySQL
- Install PHP and configure it to work with Apache web server and MySQL

(ii)   Design a static web application using HTML features.

(iii) Style the web application using different types of stylesheets.

(iv)   Create a webpage using XML.

(v)   Implement the features of Angular JS in your application.

(vi)   Create a registration and feedback form in your web application. Apply client side validations using JavaScript.

(vii) Create an application to show the working of JavaScript event handlers.

(viii) Design and build rich interactive web applications using JQuery.

(ix)   Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

(x)   Write a program to implement MVC architecture.

(xi)   Create a rich interactive web application using PHP and MySQL. Use features like sessions and cookies in the application.

Branch:PGDCSA			Semester-II		
Subject Code: 2203			**Practical: 02** **Credit: 02**		
Subject Title			**DATABASE MANAGEMENT SYSTEMS LAB**		

Modules	Sr. No:	Topics and Details	No: of lectures assigned	Marks Weight age %
UNIT-I	1	Database, Table Creation	2	05
	2	Defining Schema, Constraints, Normalisation	3	15
UNIT-II	3	SQL Basic Queries	2	
	4	Joining, and Clauses implementation	2	10
UNIT-III	5	Procedure, Function execution	4	
	6	PL SQL Script Execution	4	20
UNIT-IV	7	Stored Procedure , Function, Packages Execution	4	
	8	Cursor, Trigger Writing	4	

References: 1. Oracle 8i The Complete Reference :Loney, Koch

Branch: PGDCSA			Semester-II		
Subject Code: 2204			**Lecture: 02** **Credit: 02**		
Subject Title			**Digital Marketing Lab**		

The lab will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all. Google Analytics, Online Reputation Management, E-Mail Marketing, Affiliate Marketing, Social Media Analytics, Ad designing.

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