



पाठ्यक्रम SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

**PG DIPLOMA IN COMPUTER APPLICATION
Annual Scheme (For Affiliated Colleges)
PGDCA Examination**

2012-13 से प्रभावी(w.e.f.)

सत्र 2013-14

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

NOTICE

1. Change in Statutes/Ordinances/Rules/Regulations/ Syllabus and Books may, from time to time, be made by amendment or remaking, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change. **The decision taken by the Academic Council shall be final.**

सूचना

1. समय-समय पर संशोधन या पुनः निर्माण कर परिणियमों / अध्यादेशों / नियमों / विनियमों / पाठ्यक्रमों व पुस्तकों में परिवर्तन किया जा सकता है, तथा किसी भी परिवर्तन को छात्र को मानना होगा बशर्ते कि विश्वविद्यालय ने अन्यथा प्रकार से उनको छूट न दी हो और छात्र ने उस परिवर्तन के पूर्व वर्ष पाठ्यक्रम को पूरा न किया हो। **विद्या परिषद द्वारा लिये गये निर्णय अन्तिम होंगे।**

**TEACHING AND EXAMINATION SCHEME FOR
POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS
Session 2010 - 2011**

Paper Name (Theory)	Lec	Tut	Exam Hours	Max Marks	
				Internal	Main
DCA - 101 Introduction to IT and PC Productivity Tools	3	1	3	20	80
DCA - 102 Programming with C	3	1	3	20	80
DCA - 103 Programming with Visual Basic	3	1	3	20	80
DCA - 104 Electronic Data Processing	3	1	3	20	80
DCA - 105 Advance Database Management System	3	1	3	20	80
DCA - 106 Programming on RDBMS	3	1	3	20	80
DCA - 107 Operating System	3	1	3	20	80
DCA - 108 Java	3	1	3	20	80
Total of Theory					800

Paper Name (Practical)	Pract Hours	Pract Exam	Min	Max
			Mark	Marks
DCA - 109 Introduction to IT and PC Productivity Tools	3	3	20	50
DCA - 110 Programming with C	3	3	20	50
DCA - 111 Programming with Visual Basic	3	3	20	50
DCA - 112 Electronic Data Processing	3	3	20	50
DCA - 113 Advance Database Management System (XML)	3	3	20	50
DCA - 114 Programming on RDBMS	3	3	20	50
DCA - 115 Operating System (Linux, Explore Internet)	3	3	20	50
DCA - 116 Project	6	6	20	50
DCA - 117 Java	3	3	20	50
Total of Practical				450
Grand Total (Theory + Practical)				1250

Note:

1. Lec: Lectures Tut: Tutorials per week per hour
2. **Projects Work:** 6 hours per student
3. Duration of Practical Exam is 3 hours.

4. The question paper will be divided in 3 parts:

Part A:

1. 10 Question of 1 mark each – 10 Marks
2. Answer should not exceed more than 20 words
3. All questions are compulsory

Part B:

1. 5 Questions of 2 marks each – 10 Marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:

1. 3 Questions of 20 marks each – 60 Marks
There will be an internal choice in each question.
2. Answer should not exceed 400 words
3. All questions are compulsory.

5. There will be sessional (internal assessment) of 20 marks conducted by the college.
6. One internal and one external examiner only, in a day, shall assess the Project Report work of a batch of 20 students. The Project work should be allotted to a group of maximum 3 students and a copy of the project should be submitted to the **University**.
7. One internal and one external examiner shall conduct two practical exams, in a day, of a batch of 40 students.
8. A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
9. Practical of 50 marks distribution is as under.
 - a. 30 marks for practical examination exercise for 3 questions
 - b. 10 marks for Viva-voce
 - c. 10 marks for Laboratory Exercise File

SCHEME FOR PGDCA EXAMINATION

The examination for the Post Graduate Diploma in Computer Applications (PGDCA) will consist of one part. The examination shall consist of (a) Theory papers (b) Laboratory/ Practical work and project work. Candidates will be required to pursue a regular, full time course of study at the affiliated college for a period of one academic year in order to be eligible for appearing in the examination.

Eligibility: A candidate seeking admission to the PGDCA shall be required to possess a Bachelor's degree in any discipline with 40% marks in aggregate.

Examination:

1. A candidate who completes a regular course of study for one academic year shall be eligible to appear in PGDCA examination.
2. There shall be 17 papers (8 theory, 8 practical and 1 project as practical) of 1250 marks. Theory paper shall be of 3 hours duration having 100 marks. Out of 100 marks 20 marks shall be considered as internal assessment based on internal test and seminars and 80 marks will be of examination as determined by the University. The practical shall be of 50 marks assessed by external examiner and the project work shall be of 50 marks based on project presentation and viva-voce, assessed by external examiner.
3. For passing a candidate shall have to secure at least 40% marks in each course (theory paper, sessional and practical work separately) and 50% marks in the aggregate in all the courses.
4. Due paper(s) will be applicable if a candidate obtains 50% marks in aggregate and fails in not more than three (3) papers (theory). Due paper(s) will be

- held along with the examination of the next year. The chance of due paper(s) will be given only 2 times.
5. Wherever a candidate appears at for a due-paper examination he/she will do so according to the syllabus in force.
 6. A candidate not appearing at any examination/absent in any paper of term end examination shall be deemed as fail.
 7. A candidate will be placed in First Division if he/she secures 60% or more marks in aggregate in all the courses and in second division if he/she secures 50% or more marks but less than 60% marks in aggregate in all the courses.
 - a. Where the candidate secures at least 50% marks in aggregate of all the courses he /she shall be deemed to have passed in each such course in which he/she has secured at least 50% marks.
 - b. Where the candidate fails to secure 50% marks in aggregate of all the courses he/she shall be deemed to have passed in each such course in which he/she has secured at least 50% marks.
 - c. If a candidate fails or does not appear in more than 50% of the courses prescribed for the examination he/she may be allowed to appear at a subsequent examination subject to the condition that he/she will have to appear and pass in all the courses.

Provided that if a candidate clears any course after a continuous period of two years since he/she was admitted to the PGDCA then for the passing marks i.e. 40% marks shall be taken into account in the case of such course(s). Provided further that in case where a candidate requires more than 40% marks in order to reach the requisite minimum aggregate as many marks, out of those actually secured by him/her will be taken into account as would enable him/her to make up the deficiency in the requisite minimum aggregate marks. Candidates reappearing at an examination in a subsequent year shall be examined in accordance with the scheme and syllabi in force and shall be entitled to the award of the degree of year in which they clear the last failing/ unclear paper.

Duration: 3 hours

Max Marks: 80

DCA – 101 INTRODUCTION TO IT & PC PRODUCTIVITY TOOLS

Introduction to Computer: Definition, characteristics, classification of computers, analog computers, digital computers, hybrid computers, classifications of computers on the basis of size and speed, different types of computer generations of computers.

Computer Keyboard, pointing devices, mouse, track ball, touch pad, joysticks, touch-sensitive screens, pen based systems, digitizer, data scanning devices, optical recognition systems, barcode readers, optical mark readers, optical scanners, drum scanners, hand scanner, flatbed scanner, web camera, game pad, digital camera

Hard copy devices: Printer, impact printers, daisy wheel, dot matrix printer, line printer, chain printers, comb printers, non-impact printers, DeskJet, inkjet printers, laser printer, thermal transfer printer, barcode printers, Number systems, binary, octal, decimal, hexadecimal, addition, subtraction, multiplication. **Computer Code:** BCD, ASCII, EBCDIC code, excess-3 code, gray code. **Software:** User interface, systems software, programming software, application software. Logic gates and Boolean algebra representation and simplification by k Map.

Computer display, introduction memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory, auxiliary storage memory, memory hierarchy, storage devices, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto optical. Application of computer: Desktop publishing, sports, design and manufacturing research and design, military, robotics, planning and management, marketing, medicine and health

care, arts, communications, scientific, education.

Introduction to MS Windows, concept of GUI, program manager, file manager, print manager, accessories, running applications under MS Windows.

Introduction to MS Word, creating, editing, formatting and printing documents and other features of MS Word.

Introduction to MS Excel, creating work sheets, editing, formatting worksheets, working with cell range, formulae and functions, graphs.

Introduction to MS Power Point, creating, editing slides and frames, OLE.

Reference Books:

1. Office 2000 for Everyone, Sanjay Saxena, Vikas Publications
2. P K Sinha, Computer Fundamentals, BPB Publications
3. First Computer Course, Sanjay Saxena, Vikas Publications
4. Fundamentals of IT, Leon and Leon, Vikas Publications

Duration: 3 hours

Max Marks: 80

DCA – 102 PROGRAMMING WITH C

C Language: Types, Operators and Expressions, variable names, data types and sizes, constants, declarations, operator, expressions and type conversions.

Control flow: Statements and blocks, selection and loops structures, break, continue, branching and labels.

Functions and program structure: Basics, functions and their arguments, external variables and static variables, scope rules, register variables, block structures, initialization, recursion.

Pointers and Arrays: Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, multi-dimensional arrays, pointers arrays, pointer to functions, 2D string and string functions.

Structures: Basics, structures and functions, arrays of structures, pointers to structures, table look up fields, typedef, file,

1. ANSI C, E. Balagurusamy, Tata McGraw Hill
2. Programming in C, Gottfried, Tata McGraw
3. C Programming Language, Kernighan, Prentice Hall of India.
4. C Programming R.B. Patil, Khanna Publication

Duration: 3 hours

Max Marks: 80

DCA – 103 PROGRAMMING WITH VISUAL BASIC

Introduction: Need of Visual languages, integrated development environment (IDE), advantage of Visual Basic, characteristics and features of Visual Basic, characteristics and features of Visual Basic – IDE, Projects, user interface, objects oriented, visual development and event-driven programming, forms/graphic controls, data processing, sharing with windows and internet applications.

Visual Basic Programming and tools: An introduction of Visual Basic programming, simple program construction, statements, input/outputs, comments, editor, subroutines, controls flow statements, objects and variants.

Designing user interface – elements of user interface, understanding forms, menus and toolbars, designing menus and toolbars, building dynamic forms, drag and drop operations, working with menus, customizing the toolbars.

Controls – textbox, combo box, scroll bar and slider control operations, generating timed events, drawing with Visual Basic using graphics controls, coordinate systems and graphic methods, manipulating colors and pixels with Visual Basic.

Database Programming with Visual Basic – data access methods, creating, reading and writing text files, data controls, creating queries.

Reference Books:

1. Introduction to Programming using Visual Basic 5.0, David Schneider, PHI
2. Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publications
3. Visual Basic Programming, Dietel & Dietel, Pearson Education

Duration: 3 hours

Max Marks: 80

DCA – 104 ELECTRONIC DATA PROCESSING

Concept of system, type of decision, information system, classification, conventional file system, object of database systems, data abstraction, data definition language, data manipulation language, database administrator. Database design stages, database model, database system architecture.

Centralized and client/server architecture in DBMS, entity relationship model, entities and entity sets their relationship, mapping constraints, generalization, aggregation, use of ER model for the design of databases, sequential, random, index sequential file organization, introduction and history of relational database, system relational algebra, normalization up to BCNF.

Introduction to FoxPro: creation of database, field types, adding records, editing and deleting of data, viewing data, navigating in data file, searching of data, memory variables and arrays.

Sorting the database, Indexing, compound index files, managing multiple data files, setting environment using SET commands, setting filters, setting relations, date & time functions, character and file functions.

Programming with FoxPro, input and output, making decisions, loop constructs, debugging programs, setting up screen displays, procedures and user-defined functions, creating and printing formatted reports.

Reference Books:

1. Visual FoxPro, Programming Basics, Tom Stearns, Tata McGraw
2. Mastering Visual FoxPro 3, Siegel BPB Publications
3. Database Management System, Korth, Tata McGraw Hill.
4. Data Base System Concept, C.J.Date
5. Data Base Management system, Navathe, Pearson Education Asia

Duration: 3 hours

Max Marks: 80

DCA – 105 ADVANCE DATABASE MANAGEMENT SYSTEM

Object Oriented modeling, class, different types of attributes, generalization, inheritance, aggregation, encapsulation, complex objects, object definition language, object query language, object technology in RDBMS, primary, secondary, multi-level files, Distributed database design, architecture of distributed processing system, data communication concept, data placement, placement of DDBMS, and other components, concurrency control techniques, recovery, transaction management, need of recovery, recovery techniques, serializability, two-phase locking.

Query optimization and processing, algorithm for external sorting, select and join, object and set operations, heuristics in query optimization, temporal database concept, multi-media database, data-mining, association rule, classification, application, data-warehousing, need, architecture, characteristics, data layer, XML tree data model, document, DTD schema, query, database, data-warehousing verses view.

Reference Books:

Data Base Management System, Navathe, Pearson Education Asia.

Duration: 3 hours

Max Marks: 80

DCA – 106 PROGRAMMING IN RDBMS

Security and integrity of databases, security specifications in SQL, access control, flow control, encryption of public key infrastructure, cryptography and types.

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SQL*PLUS Data types, Constraints, Operators, DDL, DML, PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions. Stored procedures & functions, creation and execution of procedures

Database Triggers: Introduction, Use & type of database Triggers, Triggers Vs. Declarative Integrity Constraints, BEFORE Vs. AFTER Trigger Combinations, Creating a Trigger, Dropping a Trigger.

Introduction to DB2, architecture, defining database, manipulating database, external views, DB2 internals, IMS architecture, IMS physical database, IMS logical database

Reference Books:

1. SQL Complete Reference, Leon and Leon, Tata McGraw Hill
2. SQL, PL/SQL Programming Language, Ivan Bayross, BPB Publications
3. DB2 Developer's Guide, Mullins, BPB Publications

Duration: 3 hours

Max Marks: 80

DCA – 107 OPERATING SYSTEMS

Introduction to Operating Systems, goals of OS, operation of OS, resource allocator and related functions, classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems, system calls, system programs,

Process concept, interacting process, threads, process scheduling, fundamental of scheduling, scheduling criteria, long medium short term scheduling, scheduling algorithms, critical section, critical region, inter-process communication, monitor and semaphores, implementation and uses.

Logical versus physical address, swapping, contiguous allocation, segmentation, paging, segmentation with paging, kernel memory allocation, page replacement algorithm, virtual memory, virtual memory with paging, demand paging, dead lock, characterization.

History of Linux, Linux architecture, Linux File System, file naming, types of files, directory command, file command, vi editor, locating files in Linux, filter, pipe, shell variables, local and global variables, command substitution, if, while, for, shift, tar, basic networking commands in Linux.

Reference:

1. Operating System Linux, NIIT PHI
2. Operating System Concepts, Galvin, Addison Wesley
3. Operating Systems, Ritchie, BPB Publications.

Duration: 3 hours

Max Marks: 80

DCA – 108 JAVA

Introduction to Java, history, characteristics, Object oriented programming, data types, variables, arrays

Control statements : selection, iteration, jump statements, operators

Introduction to classes, class fundamentals, constructor, methods, stack class, inheritance, creating multilevel hierarchy, method over riding

Packages and interfaces, exception handling, multi-threaded programming, I/O applets
Java Library, string handling, string comparison, string buffer, utility classes, vector stack dictionary, applet class, introduction to AWT, working with frame windows.

Reference books:-

1. Y. Daniel Liang, Introduction to Java Programming, PHI.
2. Patrick Naughton, Java Complete Reference, Tata McGraw Hill.
3. The Java Handbook, Patrick Naughton, Tata McGraw Hill.
4. Introduction to Java Programming, E Balaguruswamy, PHI.
5. Programming Java, Decker & Hirshfield, Vikas Publications.