MAHARSHI DAYANAND SARASWATI UNIVERSITY,
AJMER

पाठ्यक्रम

SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

M.Sc. Computer Science
(Lateral Entry)
Semester I, II

(w.e.f. 2019-20)

ALKA PUBLICATIONS
Purani Mandi, Ajmer

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 परिनियमों/ 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
M. SC. COMPUTER SCIENCE (Lateral Entry)
W.E.F. 2019-2020
Semester I

Paper Name (Theory)	Lec Hours	Tut Hours	Exam Hours	MAX MARKS Sess-	MAX MARKS Sem
mscl-101 Programming with Java	3	1	3	20	80
mscl-102 Electronic Data Processing	3	1	3	20	80
mscl-103 Operating Systems	3	1	3	20	80
Total of Theory (Sessional & Semester Exam Marks)					300

Paper Name (Practical)		Pract Hours	Exam Hours	Max Marks
mscl-104 Lab-Programming with Java		3	3	50
mscl-105 Lab-MS-Access		3	3	50
mscl-106 Lab-Linux		3	3	50
Total of Practical Marks				150
Total of Theory & Practical Marks				450

TEACHING AND EXAMINATION SCHEME
M. SC. COMPUTER SCIENCE (Lateral Entry)
W.E.F. 2019-2020
Semester II

Paper Name (Theory)	Lec Hours	Tut Hours	Exam Hours	MAX MARKS Sessional	MAX MARKS Sem Exam
mscl-201 Python Programming	3	1	3	20	80
mscl-202 Mobile App Development with Android	3	1	3	20	80
mscl-203 Advance Database Management Systems	3	1	3	20	80
mscl-204 Advance Java Technology	3	1	3	20	80
Total of Theory (Sessional & Semester Exam Marks)					400

Paper Name (Practical)		Pract Hours	Exam Hours	Max Marks
mscl-205 Lab-Python Programming& SQL		3	3	50
mscl-206 Lab-Advance Java Technology		3	3	50
mscl-207 Lab-Project		3	3	50
Total of Practical Marks				150
Total of Theory & Practical Marks				550
Total Marks for M. Sc. Computer Science (Lateral Entry)				1000

Note:
The question paper will be divided into 3 parts:
Part A: 1. 10 Question of 1 mark each
2. Answer should not exceed more than 20 words

3. All questions are compulsory

Part B:
1. 5 Questions of 2 marks each
2. Answer should not exceed more than 50 words
3. All questions are compulsory

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

1. Lec: Lectures Tut: Tutorials per week per hour
2. Two Practical exams shall be conducted by one internal and one external examiner of a batch of 20 students in day.
3. Project Work: 6 hours per student
4. Duration of Practical exam is 3 hours.
5. A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
6. 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 of Examination
(For M. Sc. Computer Science – Lateral Entry)

Reg. 17

The examination for the M. Sc. Computer Science – Lateral Entry will consist of 2 semesters. 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 for a period of one academic year in order to be eligible for appearing in the examination.

1. Eligibility for M. Sc. Computer Science – Lateral Entry: PGDCA from any University
2. Examination:
   i. There shall be 13 papers (7 theory,6 practical). 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 at the end of each semester 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.
   ii. To pass a semester a candidate shall have to score 40% marks in each subject (theory and practical) separately and also 50% marks in aggregate of all the papers prescribed for the examination.
   iii. If a candidate obtains 50% marks in aggregate and fails in not more than one (1) paper (theory) he/she will be allowed

to keep that paper as due in the next semester examination.
   iv. Wherever a candidate appears at for a due paper examination he/she will do so according to the syllabus in force.
   v. A candidate not appearing at any examination/absent in any paper of term end examination shall be deemed as fail.
3. A candidate for a pass in the examination shall be required to obtain:
   i. At least 50% marks in the aggregate of all the papers prescribed for the examination and
   ii. At least 50% marks in the practical(s) wherever prescribed at the examination, provided that if a candidate fails to secure at least 40% marks in each individual paper at the examination notwithstanding his having obtained the minimum percentage of marks required in the aggregate for that examination.

No Division will be awarded at the first semester examination. Division shall be awarded at the end of the Final Semester Examination (i.e. the 2nd Semester) on the combined marks obtained at the first and the second semester taken together as noted below:

Passed with First Division 60% of the aggregate marks taken together of the

first and the second semester examinations

Passed with second division   48%

All the rest will be declared to have passed the examination.

Provided that if a candidate clears any paper after a continuous period of two years since he/she was admitted to the M. Sc. Computer Science – Lateral Entry then for the passing marks, i.e. 40% marks, shall be taken into account in the case of such course(s).

4. The grace marks shall be given up to 1% of the total aggregate marks of theory and practical of that semester in maximum one paper.
5. 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**
mscl-101 Programming with Java

Introduction to Java, history, characteristics, Object Oriented Programming, data types, variables, arrays, difference between Java and C++ Control statements: Selection, iteration, jump statements, operators

Classes and Methods: Introducing classes, Class fundamentals, Declaring Objects, Assigning object reference variables. Introducing method, Constructors, The this Keyword, Garbage Collection- Finalize() method, Overloading methods, Using objects as parameters, Argument Passing , Returning Objects, Recursion , static and final keyword, Nested and Inner Classes , String Class ,Command Line arguments.

Inheritance, Packages, Interfaces: Inheritance Basics, using super, method overriding, Dynamic method dispatch, abstract classes, Using final with

inheritance, Packages, Access Protection, Importing packages, Interfaces. Exception Handling, Multithreading, Applet : Exception handling fundamentals. Types, Using try, catch, throw, throws and finally . Java thread model , Creating a Thread , Creating multiple threads, Thread priorities , synchronization. Inter-thread communication, Applet Basics , Applet Skeleton, HTML applet tag – Passing parameters to applet

I/O Streams, Utility Classes:I/O Streams- Byte Streams . Character Streams, Reading and Writing Files, Legacy Classes and Interface: Vector, Stack, The Enumeration Interface, Utility classes: String Tokenizer, Date, Calendar, Random, Scanner

Javax.Swing Package: JButton, JLabel,JTextField, JPasswordField, JRadioButton, JCheckBox, JComboBox, JList, JToggleButton, JSpinner, JTabbedPane, JTable, JToolBar, JToolTip, JFrame, JPanel, JDialog, JSlider, Introduction to Event Handling: Event Classes – Event Listener interfaces

Duration: 3 hours 　　　　　　　　　　　　　　　　**Max Marks: 80**

mscl-102 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 DKNF.

MS-Access: Create a Table in MS Access -Data Types, Field Properties, Fieldsnames, types, properties, default values, format, caption, validationrules Data Entry Add record delete recode and edit text Sort, find/replace,filter/select, re-arrange columns, freeze columns. Edit a Tables- copy, delete, import, modify table structure find replace.

Setting up Relationships- Define relationships, add a relationship, set a rule for Referential Integrity, change the join type, delete a relationship, save relationship Queries & Filter –difference between queries and filter,filter using multiple fields AND,OR,advance filter Queries create Query with one table,fiend record with select query, find duplicate record with query,find unmatched record with query, run query,save and change query.

Introduction to Forms Types of Basic Forms: Columnar, Tabular, Datasheet, Main/Subforms, add headers and footers, add fields to form, add text to form use label option button, check box,combo box, list box Forms Wizard, Create Template. Introduction to Reports, Types of Basic Reports: Single Column, Tabular Report Groups/Total, single table report multi table report preview report print report, Creating Reports and Labels, Wizard

Duration: 3 hours 　　　　　　　　　　　　　　　　**Max Marks: 80**

mscl-103 Operating Systems

Introduction to Operating Systems, goals of OS, operation of OS, resource

allocater and related functions, classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems, system calls, system programs, structure of OS, layer design of DOS, Unix.

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

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, methods for handling dead locks, prevention, avoidance, thrashing, allocation of frame, virtual memory using segmentation

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.

Duration: 3 hours 　　　　　　　　　　　　　　　　**Max Marks: 80**

mscl-201 Python Programming

Programming basics and strings, numbers and operators, variables, making decisions Functions, classes and objects, organizing programs, files and directories Building modules, text processing, Writing a GUI with Python, Accessing Databases Python with XML, Network Programming, Programming with C, Numerical Programming, Web Application and Web Services, Integrating Java with Python

Duration: 3 hours 　　　　　　　　　　　　　　　　**Max Marks: 80**

mscl-202 Mobile App Development with Android

Introduction to mobile communication and computing: Introduction to mobile computing, Novel applications, limitations and GSM architecture, Mobile services, System architecture, Radio interface, protocols, Handover and security. Smart phone operating systems and smart phones applications Fundamentals of Android Development: Introduction to Android., The Android SDK, Understanding the Android Software Stack, Installing the Android SDK, Creating Android Virtual Devices, Creating the First Android Project, Using the Text View Control, Using the Android Emulator, The Android Debug Bridge (ADB), Basic Widgets Understanding the Role of Android Application Components, Event Handling , Displaying Messages Through Toast, Creating and Starting an Activity, Using the Edit ext Control.

The Android Debug Bridge (ADB), basic widgets understanding the role of Android Application Components, event handling, displaying messages through toast, creating and starting an activity, using the Edit ext Control Building Blocks for Android Application Design, Laying Out Controls in Containers, utilizing resources and media

Using Selection Widgets and Debugging Displaying and Fetching Information Using Dialogs and Fragments Advanced, Android Programming: Internet, Entertainment, and Services, Implementing drawing and animations, displaying

web pages and maps, communicating with SMS and emails, creating and using content providers: creating and consuming services, publishing android applications

Duration: 3 hours   **Max Marks: 80**

mscl-203 Advance Database Management Systems

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, dynamic multi-level index using B & B+ tree,

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,

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.

Security and integrity of databases, security specifications in SQL, access control, flow control.

Duration: 3 hours   **Max Marks: 80**

mscl-204 Advance Java Technology

Servlet Structure, Servlet packaging, HTML building utilities, Lifecycle, Single Thread model interface, Handling Client Request: Form Data, Handling Client Request: HTTP Request Headers. Generating server Response: HTTP Status codes, Generating server Response: HTTP Response Headers, Handling Cookies, Session Tracking.

Overview of JSP Technology, Need of JSP, Benefits of JSP, Advantages of JSP, Basic syntax, invoking Java code with JSP scripting elements, creating Template Text, Invoking java code from JSP, Limiting java code in JSP,using JSP expressions, comparing servlets and JSP, writing scriptlets. Using Scriptlets to make parts of JSP conditional, using declarations, declaration example. Controlling the Structure of generated servlets: the JSP page directive, import attribute, session attribute, isElignore attribute, buffer and auto flush attributes, info attribute ,errorPage and is errorPage attributes, is Thread safe Attribute, extends attribute, language attribute, Including files and applets in JSP Pages, using java beans components in JSP documents

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