MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

पाठ्यक्रम

SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

M.C.A. - Lateral Entry

Semester-I, Semester-II

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 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।**

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TEACHING AND EXAMINATION SCHEME FOR

M. C. A. – LATERAL ENTRY

SEMESTER – I

Paper Name (Theory)	Lec	Tut	Exam Hours	Sess Marks	Sem Exam Marks
Soft Computing	3	1	3	20	80
Advance Linux Technology	3	1	3	20	80
Elective – I	3	1	3	20	80
1. System and Signal					
2. Theory of formal languages and automation					
Total of Theory					**300**

Paper Name (Practical)	Exam Hours	Max Marks
Advance Linux Technology	3	50
Elective – I	3	50
1. System and Signal		
2. Theory of formal languages and automation		
Total of Practical		100
Grand Total (Theory + Practical)		**400**

SEMESTER – II

Paper Name (Theory)	Lec	Tut	Exam Hours	Sess Marks	Sem Exam Marks
Artificial Intelligence	3	1	3	20	80
Elective – II	3	1	3	20	80
1. Data Warehouse & Data Mining					
2. Advance GIS Tools					
Seminar	3	1	3	20	80
Dissertation			6	40	160
Total of Theory					**500**

Paper Name (Practical)	Exam Hours	Max Marks
Artificial Intelligence	3	50
Elective – II	3	50
Data Warehouse & Data Mining		
Advance GIS Tools		
Total of Practical		100
Grand Total (Theory + Practical)		**600**
Total Marks for M. C. A. (Lateral Entry):		**1000**

Note:

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.

There will be sessional (internal assessment) of 20 marks conducted by the department.

Two Practical exams shall be conducted by one internal and one external examiner of a batch of 30 students in day.

Duration of Practical exam is 3 hours.

A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.

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. C. A. – Lateral Entry)

Reg. 17

The examination for the M. C. A. – 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 at the University department for a period of one academic year in order to be eligible for appearing in the examination.

1. Eligibility for M. C. A. – Lateral Entry: M. Sc. Computer Science/M. Sc. Computer Science – LE/ M. Sc. Information Technology from the M.D.S. University, Ajmer.
2. Examination:
   i. There shall be 11 papers (3 theory, 2 practical in first i. There shall be 11 papers (3 theory, 2 practical in first semester and 2 theory, 2 practical 1 seminar and 1 dissertation in the second semester). 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, the seminar shall be of 100 marks based on seminar presentation and viva-voce, assessed by external examiner and the dissertation shall be of 200 marks based on 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. C. A. – 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.

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.

SEMESTER I

Duration 3 hours *Max marks 80*

SOFT COMPUTING

Basic of neural Networks, inference and learning, classification of models, association of models, optimization and self organization models, definition of learning, supervised and unsupervised learning. AI learning, neural network learning, knowledge based neural network, rule based, decision tree based, constraint based neural network.

Incremental learning, symbolic methods, neural network approaches, applications of neural networks, neural networks as mathematical models, expert system heuristic, hierarchical models, hybrid, parallel, control network discovery, symbolic methods, neural network methods.

Genetic Algorithm, evolutionary programming, classifier system, genetic programming parse tree, mathematical foundation of GA variant of GA (Hybrid and fuzzy GA enhancement of genetic programming application

Duration 3 hours *Max marks 80*

ADVANCE LINUX TECHNOLOGY

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.

MySQL:

The MySQL RDBMS, open source movement, connecting to MySQL database, My SQL File storage, managing databases, tables, indexes, database objects.

Inserting, updating, deleting MySQL databases, SELECT, optional clauses of database, MySQL expressions, operators, MySQL Functions, comparing and converting data

Managing different types of data, summarizing data, performing system operations, JOIN sub-query, exporting copy and importing data, performing transactions, Auto commit mode, locking, managing system variables, log file, access privilege system.

PHP:

PHP Basics, variable data types, arrays, constants, operators, control structures, loops, functions, PHP object oriented language, PHP design patterns, overloading, how to write a web application with PHP, user input, validation, filter error handling, session, cookies, uploading

Elective – I

Duration 3 hours *Max marks 80*

1.1 SYSTEM AND SIGNAL

Signals and classification of signals, continuous and discrete time signals, linear time invariant system, response and property of continuous time, response and property of discrete time, laplace transformation, properties, inverse laplace transformation, system function

z-transformation, properties of z-transform, inverse z-transform, system function of discrete-time LTI System, unilateral z-transform.

Fourier series representation of periodic signals, Fourier Transform, properties of the continuous-time Fourier Transform, Frequency Response of continuous-time LTI

Discrete Fourier series, Fourier Transform, properties of the Fourier Transform, Frequency Response of Discrete-time LTI Systems.

1.2 THEORY OF FORMAL LANGUAGES AND AUTOMATA

Preliminaries: Strings, Alphabet and languages, Graphs and Trees, Inductive proofs, set notation, relations,

Definition of Automation, finite automata, transition system, Finite State Systems, Basic definitions, Non-deterministic Finite Automata, Regular Expressions, Deterministic Finite Automation (DFA), Non-deterministic Finite Automation (NFA), regular languages and regular sets, equivalence of DFA and NFA, minimizing the number of states of a DFA, non-regular languages and pumping lemma, Closure properties of regular sets, Pushdown Automation (PDA), Deterministic Pushdown Automation (DPDA), Non-equivalence of PDA and DPDA.

Introduction CFG, derivation trees, simplification of context free grammar, Chomsky normal form, Grebach normal form, the existence of inherently ambiguous context free languages. Ambiguity, Parse Tree Representation of Derivations, Equivalence of PDA's and CFG's Parsing techniques for parsing of general CFG's – Early's, Cook – Kassami – Younger (CKY) and Tomita's parsing.

Turing Machine: Introduction, the Turing machine Model, computable languages and functions, techniques for Turing Machine construction, modification of TM Church's hypothesis, TM as enumerators, restricted TM equivalent to the basic model.

SEMESTER II

Duration 3 hours *Max marks 80*

ARTIFICIAL INTELLIGENCE

Definition of AI, Application of AI, knowledge-based systems, representation of knowledge organization and acquisition of knowledge.

Introduction of prolog, variable, object, domain, clauses, recursion

basic list manipulation function, predicates, input, output, local variables, iteration, recursion, arrays, database in prolog, rule order, goal order, cut trial prolog query.

Syntax, semantics of propositional logic, syntax and semantics of FOPL, conversion to clausal form, inference rule, resolution principles, non-deductive inference methods, representation using rules, truth maintenance system, predicate completion and circumscription, modal and temporal logics

Bayesian probabilistic inference, possible word representation, Dempster-Shafer Theory, Ad-Hoc methods.

Elective – II

Duration 3 hours *Max marks 8(*

2.1 DATA WAREHOUSE AND DATA MINING

Data Warehouse:

Store, warehouses, mart, data warehouse architecture layer topologies, meta-data key and action of metadata, implementing the data warehouse data warehouse technologies,

Role and structure of data warehouse, cost of warehousing data, function of data warehouse

Data Mining:

Basic task data mining task, data mining versus knowledge discovery, data mining issue, matrices, statistical perspective of data mining, similarity measure, decision tree, classification, statistical, distance, decision tree based algorithms.

Clustering, hierarchical algorithm, partitional algorithm, clustering large databases, association rules, basic algorithm, parallel and distributed algorithm.

2.2 ADVANCE GIS TOOLS

Introduction to GIS, history, definition, hardware and software, raster based GIS, data acquisition, nature of spatial data, geo-referencing.

GIS functionality, data models, raster, vector, object oriented, coordinate system and geo-coding, data structures

Introduction to ArcView, creating maps, adding tabular data, choosing map projection, attribute features, aggregating data, creating and editing spatial data.

Introduction to ArcAvenue, data types, string, numbers, geo-coding, script writing, loops, interacting with views and themes, graphics, creating layout.

Spatial data overview, data mining primitives, generalization and specialization, spatial rules, classification algorithms, classification, clustering algorithms.