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Annexure A/13

Department of Computer Science & Applications

M. D. University, Rohtak

ORDINANCE FOR REGULAR MASTER OF COMPUTER APPLICATIONS (MCA) 2-YEAR PROGRAM

With effect from the Session 2020-21

1. The duration of the course leading to the conferment of the degree of MCA shall be two academic years divided into four semesters.
2. The minimum eligibility condition for admission to 1st semester of the course shall be as follows:-
 - a) Passed BCA/B.Sc.(Hons.)Computer Science/ B.E. or B.Tech.(CSE/IT)/ B.Voc.(Software Development/IT) or an equivalent degree with at least 50% marks (45% for SC/ST candidates of Haryana only) in aggregate.

Or

- b) Passed B.Sc/ B.Com/ B.A with Mathematics at 10+2 level or at Graduation level with at least 50% marks(45% for SC/ST candidates of Haryana only) in aggregate, alongwith the students admitted with this eligibility will have to simultaneously undertake additional **Bridge Course** as prescribed by the University during the first semester.

Note:

***Bridge Course:** It is compulsory for each student to pass out Bridge Course (three additional theory papers and one practical as prescribed in Scheme of Examinations of Bridge Course) as per University Norms during the 1st year of Regular MCA 2- year program. However, these papers under Bridge Course will be taught only in the 1st semester of the course.

3. The examination for the 1st and 3rd semesters shall ordinarily be held in the month of December/January and for the 2nd and 4th semesters, in the month of April/May on such dates as may be notified by the Controller of Examinations.

A supplementary examination for 1st & 2nd semesters shall be held along with their regular 1st & 2nd semester examinations. However, the supplementary examination for 3rd and 4th semesters of MCA 2-Year programme as well as Bridge Course shall be held simultaneously after every six months.

It is compulsory to complete the Industrial Internship Report/Project Work training by each student in regular MCA 2-year programme after 2nd semester examinations of 8 weeks duration and after 4th semester examinations of 6 weeks duration. Industrial Internship report/ Project

work shall be submitted by each student to the Head of the Department/Principal/Director of the College/Institute through his/her supervisor latest by 31st July of the academic year. External viva of the Industrial Internship Report/Project Work will be held in month of August of the year.

4. After passing any Post Graduate Examination (MCA) from any University/College, candidate shall be allowed admission in any PG course in any of the Department/College. However, no hostel facilities shall be provided to them as admission in the hostel shall be allowed only once at the time of 1st entry in the University/affiliated Colleges running PG courses.

5. Every candidate shall be examined in the subject(s) as laid down in the syllabus and Scheme of Examination of MCA course prescribed by the Academic Council from time to time. The fail/reappear candidates will also appear in the examination as per syllabus applicable to regular students of that semester.

6. The examination schedule containing the dates of receipt of examination forms with and without late fee, shall be notified by the Controller of Examinations from time to time.

7. Every candidate shall be examined in the subjects as laid down in the scheme of the examination and syllabus prescribed by the Academic Council from time to time. There shall be 20% marks for internal assessment in the each paper (Theory/Practical/Industrial Internship Report/Dissertation/ Project Report).

The Head of the Department/Principal shall forward the internal assessment marks awarded by the concerned teacher on the basis of class test, written assignment and its Presentation/Seminar and attendance in the classes etc. to the Controller of Examinations as per the following schedule:

(i) The Internal Assessment/Sessionals marks should be supplied by the Heads of the Departments/Principals of the Colleges/Heads of the Institutions invariably **within 20 days after the commencement of the examination** unless mentioned explicitly in view of the requirement of the specific course.

(ii) Thereafter, a late fee @ Rs.25/- per candidate per subject shall be charged from the Department/College/Institute concerned.

(iii) No Internal Assessment/ Sessionals marks shall be entertained, if the same are received into the University after 30 days of the declaration of results. However, Vice Chancellor may condone the delay with late fee after taking into consideration the merit of each case.

8. The Head of Department/Principal will preserve the record on the basis of which the internal assessment awards have been prepared for inspection, if needed by the University up to three months from the date of declaration of the result of semester examination.

9. The candidate will be allowed to appear in the examination if he/she meets the following requirements:-

(a) Bears a good character

(b) Has been on the rolls of the Department/College/Institution during the semester.

(c) Has attended not less than 65% of lectures delivered in theory as well as practicals.

Relaxation in shortage of lectures upto 20% will be allowed by the Head of the Department/Principal of the College/institute on the following grounds:

(i) Self-illness;

(ii) Illness/death of parents, brother, sister or any other close family member;

(iii) Any other reason beyond the control of the student to the satisfaction of the Head of the Institution/Department.

10. The medium of instructions in the examination shall be English.

11. The minimum percentage of marks to pass the examination in each semester shall be:

(i) 40% in each theory paper

(ii) 40% in each practical examination or viva-voce/Project Report/Industrial Internship Training Report/Dissertation wherever prescribed.

(iii) 40% in the aggregate of each theory paper and internal assessment (and practical where practical is a component of theory paper).

12. The examination fee to be paid by the candidate for each semester shall be prescribed by the University from time to time.

13. (i) A candidate who fails to pass or having been eligible, fails to appear in any semester examination will be allowed to clear the re-appear paper(s) and also for improvement of result after passing a semester examination within a period of five years. While re-appearing to pass a semester examination, the candidate will be exempted from re-appearing in the papers/practicals in which he/she has secured 40% pass marks.

(ii) A candidate will be allowed to join the MCA 3rd semester class only if he/she clears all the subjects given in the Bridge Course.

(iii) The candidate shall be treated as promoted to the next semester/class automatically subject to fulfillment of conditions as laid down in clause-9 of the ordinance and the eligibility of the course.

14. The internal assessment awards as well as viva-voce awards of a candidate who fails in any semester examination shall be carried forward to the next examination.

15. Soon after the termination of the examination, the Controller of Examinations shall declare the result as early as possible.

16. The list of successful candidates after the fourth semester examination shall be arranged as under in three divisions on the basis of the aggregate marks obtained in the 1st , 2nd , 3 rd and 4th semester examinations taken together, and the division obtained by the candidate will be stated in his degree:-

(a) Those who obtain 60% or more marks -- First Division

(b) Those who obtain 50% or more marks -- Second Division but less than 60% marks

(c) Those who obtain less than 50% marks --Third Division

If a candidate secures 75% or more marks in a course in first attempt, he/she will be awarded 1st class Degree with Distinction.

NOTE: The candidate who has passes all the semester examination in the 1st attempt obtaining at least 75% marks in aggregate shall be declared to have passed in the 1st division mentioned in the degree.

17. After passing each semester examination, a candidate will be allowed to appear for improvement of result in one or more theory papers only once within the period prescribed in Clause-13 (i). Only improved marks (higher score) will be taken into account. The candidate will have to appear according to the current syllabus.

18. The grace marks will be allowed as per University rules.

19. The Industrial Internship Report/Project Report/Dissertation wherever prescribed in the syllabus/scheme of examination and required to be submitted in the University must reach in the concerned office within 10 days after the last date of submission as prescribed in the Ordinance.

20. The Industrial Internship Report/Project Report/Dissertation after 2nd and 4th semesters will be forwarded by the Head of the Department /Principal of College concerned. The candidate shall be required to submit three copies of his/her Industrial Internship Report/Dissertation/Project Report. The last date of receipt of Industrial Internship Report/Project Report/Dissertation in the office of Head of the Department/Principal of the college through his/her supervisor shall be 31st July of the year.

The candidate can submit the Industrial Internship Report/Dissertation/ Project Report with late fee of Rs.500/-within three months after the last date of receipt of the Industrial Internship Report/ Dissertation in the University. Provided that in exceptional cases, the Vice-Chancellor has the power to extend, on the recommendations of the Head of the Department/ Principal of the college concerned, the last date for receipt of Industrial Internship Report/ dissertation/ Project Report up to three months.

- a) Industrial Internship Report/Project Report/Dissertation and Viva-Voce shall be evaluated/conducted jointly by the Internal and External examiner. If the two examiners are unable to agree in respect of a student, the average of the two awards shall be taken as final award of the Project.
 - b) The Industrial Internship Report/Dissertation/Project Report submitted by the candidates for any semester examination should not have been submitted earlier partially or fully for the award of any other diploma/degree in the University or any other University /Instruction. The candidates shall have to furnish a certificate to this effect while submitting the Industrial Internship Report/ dissertation/ Project Report.
 - c) The Industrial Internship Report/Project Report/Dissertation shall be carried out by the candidate individually. The same Industrial Internship Report/Project Report/Dissertation should not be submitted by two or more candidates otherwise the Industrial Internship Report/Project Report/Dissertation shall be cancelled by the University.
21. A candidate who joins regular MCA 2-Year programme shall not be allowed to pursue another course of study simultaneously in any institution of this University or any other University.
22. Any other point of the common ordinance for two year P.G. programme (four semesters) of M. D. University, Rohtak which may be applicable to this course.
23. Notwithstanding the integrated nature of this course which is spread over more than one semester, the Ordinance in force at the time a student joins the course shall hold good only for the examination held during or at the end of the semester and nothing in this Ordinance shall be deemed to debar the University from amending the Ordinance subsequently and the amended Ordinance, if any, shall apply to all students, whether old or new.

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**Scheme of Examinations and Syllabus
for
Bridge Course to Regular MCA 2- year programme
With effect from the Session 2020-21**

Programme Specific Outcomes:

The students upon completion of bridge course will be able to:

PSO1: To scale up the knowledge and understanding to be able to continue MCA 2-year programme.

PSO2: Apply knowledge of computing fundamentals for understanding problems that may be solved using computers.

PSO3: Analyze scenarios that require integrated solutions using one or more Programming Languages.

PSO4: Create basic computing skills to undertake more specialized courses offering emerging technologies with ease.

PSO5: Advance their career in the domain of computer science by acquiring higher order skills.

Course Code	Course Name	External Marks	Internal Marks	Total	Credits
20BCC11C1	Computer Fundamentals and Programming in C	80	20	100	4:0:0
20BCC11C2	C++ and Data Structures	80	20	100	4:0:0
20BCC11C3	Visual Basic & Database Systems	80	20	100	4:0:0
20BCC11CL1	Lab based on 20BCC11C1, 20BCC11C2 & 20BCC11C3	80	20	100	0:0:4
Total credits					16

SCHEME OF EXAMINATIONS AND SYLLABUS
REGULAR MASTER OF COMPUTER APPLICATIONS 2- YEAR PROGRAMME
With effect from the Session 2020-21

Programme Specific Outcomes:

The students upon completion of Regular MCA 2-year Programme will be able:

- PSO1 To apply knowledge of computing fundamentals, computing specialization and domain knowledge for the abstraction and conceptualization of computing models from defined problems and requirements.
- PSO2 To have the ability to understand and analyze a given real-world problem and propose feasible computing solutions. Also analyze customer requirements, create high level design, implement and document robust and reliable software systems.
- PSO3 To transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
- PSO4 To use the latest technologies like IoT, AI, Machine Learning, Big Data Analytics, Cyber Security and modern hardware and software tools necessary for innovative software solutions and to possess leadership and managerial skills with best professional ethical practices and social concern
- PSO5 To master fundamental project management skills, concepts and techniques, set attainable objectives and ensure positive results, meeting scope, time and budget constraints
- PSO6 To recognize the need for self-motivation to engage in lifelong learning, the social, professional, cultural and ethical issues involved in the use of computer technology and give them due consideration in developing software systems
- PSO7 To assess the need for innovation and initiate the process through entrepreneurship or otherwise and to work collaboratively as a member or leader in multidisciplinary teams
- PSO8 To select their career after acquiring necessary eligibility requirement and the skill-set.

MCA First Year

Semester-I

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
20MCA21C1	Object Oriented Programming Using JAVA	80	20	100	4:0:0
20MCA21C2	Compiler Design	80	20	100	4:0:0
20MCA21C3	Computer Graphics & Multimedia	80	20	100	4:0:0
20MCA21C4	Digital Design & Computer Architecture	80	20	100	4:0:0
20MCA21C5	Advance Data Structures Using C++/Java	80	20	100	4:0:0
20MCA21CL1	Software Lab -1 Based on 20MCA21C1,	100*	----	100	0:0:3

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	20MCA21C2 & 20MCA21C3				
20MCA21CL2	Software Lab -2 Based on 20MCA21C4 & 20MCA21C5	100*	----	100	0:0:3
Total					Credits 26

Semester-II

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
20MCA22C1	Advance Object Technology	80	20	100	4:0:0
20MCA22C2	Advance Database Systems & Data Warehouse	80	20	100	4:0:0
20MCA22C3	Operating Systems & Shell Programming	80	20	100	4:0:0
	Elective-I				
20MCA22DA1/	i) Theory of Computation	80	20	100	4:0:0
20MCA22DA2/	ii) Computer Networks & Distributed Systems	80	20	100	4:0:0
20MCA22DA3/	iii) Web Technologies	80	20	100	4:0:0
	Elective-II				
20MCA22DB1/	i) Cloud Computing	80	20	100	4:0:0
20MCA22DB2/	ii) Software Engineering	80	20	100	4:0:0
20MCA22DB3/	iii) Advance Computer Architecture & Quantum Computing	80	20	100	4:0:0
20MCA22CL1	Software Lab-3 Based on 20MCA22C1 & Elective I and/or II	100*	----	100	0:0:3
20MCA22CL2	Software Lab-4 Based on 20MCA22C2 & 20MCA22C3	100*	----	100	0:0:3
20MCA22C4	Industry Internship Report/ Project Report/Dissertation -I	100**	----	100	0:3:0
Total					Credits 29
	Foundations Elective (O)				
	To be Chosen from the pool of Foundation Electives provided by the university				2

Total Credits= 31 Credits

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

**20 marks out of 100 will be based on evaluation/assessment of the candidate by the internal supervisor.

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With effect from the Session 2021-22

MCA SECOND YEAR

Semester-III

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
21MCA23C1	Data Mining & Big Data Analytics	80	20	100	4:0:0
21MCA23C2	Artificial Intelligence & Computational Intelligence	80	20	100	4:0:0
21MCA23C3	Android Mobile Application Development	80	20	100	4:0:0
	Elective-I				
21MCA23DA1/	i) Computer Vision	80	20	100	4:0:0
21MCA23DA2/	ii) Software Testing & Quality Assurance	80	20	100	4:0:0
21MCA23DA3/	iii) Mixed Reality & Wearable Computing	80	20	100	4:0:0
	Elective-II				
21CA23DB1/	i) Network Programming	80	20	100	4:0:0
21MCA23DB2/	ii) Natural Language Processing & Speech recognition	80	20	100	4:0:0
21MCA23DB3/	iii) Bioinformatics Computing	80	20	100	4:0:0
21MCA23CL1	Software Lab-5 Based on 21MCA23C1&21MCA23C3	100*	----	100	0:0:3
21MCA23CL2	Software Lab-6 Based on 21MCA23C2, Elective I & II	100*	----	100	0:0:3
Total					Credits 26
	Open Elective (O)				
	To be Chosen from the pool of Open Electives provided by the University (excluding the open elective prepared by the Department of Comp Sc. & Appls.)				3

Total Credits= 29 Credits

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

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Semester-IV

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
21MCA24C1	Advance Software Engineering	80	20	100	4:0:0
21MCA24C2	IoT & Sensor Networks	80	20	100	4:0:0
21MCA24C3	Web Development Using .NET Framework	80	20	100	4:0:0
	Elective-I				
21MCA24DA1/	i) Cyber Security & Blockchain Technology	80	20	100	4:0:0
21MCA24DA2/	ii) Edge and Fog Computing	80	20	100	4:0:0
21MCA24DA3/	iii) High Speed Networks	80	20	100	4:0:0
	Elective-II				
21MCA24DB1/	i) Machine Learning & Python Programming	80	20	100	4:0:0
21MCA24DB2/	ii) Web Development Using PHP	80	20	100	4:0:0
21MCA24DB3/	iii) Neural Networks & Deep Learning	80	20	100	4:0:0
21MCA24CL1	Software Lab-7 Based on 21MCA24C2 & Elective II	100*	---	100	0:0:3
21MCA24CL2	Software Lab-8 Based on 21MCA24C3 & Elective I	100*	---	100	0:0:3
21MCA23C6	Industry Internship Report/ Project Report/ Dissertation -II	100**	---	100	0:3:0
Total					Credits 29
				Grand Total of 2 Years/Credits	Credits 115

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

** 20 marks out of 100 will be based on evaluation/assessment of the candidate by the internal supervisor.

SCHEME OF EXAMINATIONS

REGULAR MASTER OF COMPUTER APPLICATIONS 2- YEAR PROGRAM

With effect from the Session 2020-2021

Programme Specific Outcomes:

The students upon completion of Regular MCA 2-year Program will be able:

- PSO1 To apply knowledge of computing fundamentals, computing specialization and domain knowledge for the abstraction and conceptualization of computing models from defined problems and requirements.
- PSO2 To have the ability to understand and analyze a given real-world problem and propose feasible computing solutions. Also analyze customer requirements, create high level design, implement and document robust and reliable software systems.
- PSO3 To transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
- PSO4 To use the latest technologies like IOT, AI, Machine Learning, Big Data Analytics, Cyber Security and modern hardware and software tools necessary for innovative software solutions and to possess leadership and managerial skills with best professional ethical practices and social concern
- PSO5 To master fundamental project management skills, concepts and techniques, set attainable objectives and ensure positive results, meeting scope, time and budget constraints
- PSO6 To recognize the need for self-motivation to engage in lifelong learning, the social, professional, cultural and ethical issues involved in the use of computer technology and give them due consideration in developing software systems
- PSO7 To assess the need for innovation and initiate the process through entrepreneurship or otherwise and to work collaboratively as a member or leader in multidisciplinary teams
- PSO8 To select teaching/software engineer as their career after acquiring necessary eligibility requirement.