



## Department of Information, Communication & Technology

Ref.No.: TIAS/DICT/MCA/2023-24/008

Dated: 17.07.2023

Programme: Master of Computer Applications

### Semester Wise Examination Scheme

The semester wise Evaluation scheme of MCA Programme will be as follows:

#### FIRST SEMESTER EXAMINATION

| Code No.                                     | Paper                                    | Course Category       | L | T/P | Credits | Marks Internal | Marks External | Max. Marks |
|--|--|-----------------------|---|-----|---------|----------------|----------------|------------|
| <b>Course Course Theory</b>                  |  |                       |   |     |         |                |                |            |
| MCA-101                                      | Discrete Structures                      | Core Course Theory    | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-103                                      | Computer Networks                        | Core Course Theory    | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA 105                                      | Operating Systems with Linux             | Core Course Theory    | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA 107                                      | Database Management Systems              | Core Course Theory    | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-109                                      | Object Oriented Programming and JAVA     | Core Course Theory    | 3 | 1   | 4       | 40             | 60             | 100        |
| <b>Core Course Practical</b>                 |  |                       |   |     |         |                |                |            |
| MCA-161                                      | Computer Networks Lab.                   | Core Course Practical | 0 | 2   | 1       | 40             | 60             | 100        |
| MCA 163                                      | Operating Systems with Linux Lab.        | Core Course Practical | 0 | 2   | 1       | 40             | 60             | 100        |
| MCA 165                                      | Database Management Systems Lab          | Core Course Practical | 0 | 2   | 1       | 40             | 60             | 100        |
| MCA-167                                      | Object Oriented Programming and JAVA LAB | Core Course Practical | 0 | 2   | 1       | 40             | 60             | 100        |
| <b>Ability Enhancement Compulsory Course</b> |  |                       |   |     |         |                |                |            |
| MCA-169                                      | Minor Project – I                        | AECC-1                | 0 | 6   | 3       | 40             | 60             | 100        |

|         |  |        |           |           |           |     |   |     |
|---------|--|--------|-----------|-----------|-----------|-----|---|-----|
| MCA-171 | Professional Proficiency – I (It is suggested to have Personality Development and Communication Skills course) | AECC-2 | 0         | 2         | 1         | 100 | - | 100 |
|         |  |        |           |           |           |     |   |     |
|         | <b>Total Credits</b>   |        | <b>15</b> | <b>21</b> | <b>28</b> |     |   |     |

## SECOND SEMESTER EXAMINATION

| Code No.   | Paper                                      | Course Category    | L | T/P | Credits | Marks Internal | Marks External | Max. Marks |
|--|--|--------------------|---|-----|---------|----------------|----------------|------------|
| <b>Core Course Theory</b>                            |  |                    |   |     |         |                |                |            |
| MCA-102  | Data and File Structures                   | Core Course Theory | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA 104  | Object Oriented Software Engineering       | Core Course Theory | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA 106  | Python Programming                         | Core Course Theory | 3 | 1   | 4       | 40             | 60             | 100        |
| <b>Discipline Specific Elective (Choose any one)</b> |  |                    |   |     |         |                |                |            |
| MCA-108  | Advanced Database Management Systems       | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-110  | Data Warehousing and Data Mining           | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-112  | Mobile applications Design and Development | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-114  | Full Stack Development                     | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-116  | Web Technologies                           | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-118  | Theory of Computations                     | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-120  | Software Testing                           | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-122  | Microprocessors                            | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-124  | Embedded System                            | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-126  | Information Security                       | DSE-1              | 3 | 1   | 4       | 40             | 60             | 100        |
| <b>Generic Elective (Choose any one)</b>             |  |                    |   |     |         |                |                |            |
| MCA-128  | Digital Marketing                          | GE-1               | 3 | 1   | 4       | 40             | 60             | 100        |
| MCA-130  | Management Information System              | GE-1               | 3 | 1   | 4       | 40             | 60             | 100        |

|   |   |                       |           |           |           |     |    |     |
|---|---|-----------------------|-----------|-----------|-----------|-----|----|-----|
| MCA-132                                       | Management Principles and Organizational Behavior | GE-1                  | 3         | 1         | 4         | 40  | 60 | 100 |
| MCA-134                                       | Finance and Accounting                            | GE-1                  | 3         | 1         | 4         | 40  | 60 | 100 |
| <b>Ability Enhancement Compulsory Course</b>  |   |                       |           |           |           |     |    |     |
| MCA-170                                       | Minor Project – II                                | AECC-3                | 0         | 6         | 3         | 40  | 60 | 100 |
| MCA-172                                       | Environment Science (NUES)                        | AECC-4                | 3         | 0         | 3         | 100 | -  | 100 |
| MCA-174                                       | Professional Proficiency – II (NUES)              | AECC-5                | 0         | 2         | 1         | 100 | -  | 100 |
| <b>Core Course Practical</b>                  |   |                       |           |           |           |     |    |     |
| MCA-162                                       | Data and File Structures Lab.                     | Core Course Practical | 0         | 2         | 1         | 40  | 60 | 100 |
| MCA-164                                       | Object Oriented Software Engineering Lab.         | Core Course Practical | 0         | 2         | 1         | 40  | 60 | 100 |
| MCA-166                                       | Python Programming Lab.                           | Core Course Practical | 0         | 2         | 1         | 40  | 60 | 100 |
| <b>Discipline Specific Elective Practical</b> |   |                       |           |           |           |     |    |     |
| MCA-168                                       | Lab. based on Core Elective - I                   | DSE-1 Practical       | 0         | 2         | 1         | 40  | 60 | 100 |
|   | <b>Total Credits</b>                              |                       | <b>18</b> | <b>21</b> | <b>31</b> |     |    |     |

### THIRD SEMESTER EXAMINATION

| Code No.  | Paper  | Course Category    | L | T/P | Credits | Marks Internal | Marks External | Max Marks |
|---|--|--------------------|---|-----|---------|----------------|----------------|-----------|
| <b>Core Course Theory</b>                               |  |                    |   |     |         |                |                |           |
| MCA-201   | Design and Analysis of Algorithms            | Core Course Theory | 3 | 1   | 4       | 40             | 60             | 100       |
| MCA-203   | Artificial Intelligence and Machine Learning | Core Course Theory | 3 | 1   | 4       | 40             | 60             | 100       |
| <b>Discipline Specific Elective –I (Choose any one)</b> |  |                    |   |     |         |                |                |           |
| MCA-205   | Statistics and Data Analytics                | DSE-2              | 3 | 1   | 4       | 40             | 60             | 100       |
| MCA-207   | Enterprise Computing with JAVA               | DSE-2              | 3 | 1   | 4       | 40             | 60             | 100       |
| MCA-209   | Natural Language Processing                  | DSE-2              | 3 | 1   | 4       | 40             | 60             | 100       |
| MCA-211   | Computer Graphics                            | DSE-2              | 3 | 1   | 4       | 40             | 60             | 100       |

|   |                                    |        |   |   |   |     |    |     |
|---|------------------------------------|--------|---|---|---|-----|----|-----|
| MCA-213   | Wireless Sensor Networks           | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-215   | Software Project Management        | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-217   | Advanced Computer Architecture     | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-219   | Distributed Systems                | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-221   | Applied Cryptography               | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-223   | Cloud Computing                    | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-225   | e-Business Systems                 | DSE-2  | 3 | 1 | 4 | 40  | 60 | 100 |
| <b>Discipline Specific Elective-II (Choose any one)</b> |                                    |        |   |   |   |     |    |     |
| MCA-227   | Web Intelligence and Big Data      | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-229   | Flutter and Dart                   | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-231   | Service Oriented Architecture      | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-233   | Multimedia Technologies            | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-235   | Internet of Things                 | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-237   | Soft Computing                     | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-239   | Software Quality Management        | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-241   | Digital Image Processing           | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-243   | Compiler Design                    | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-245   | Parallel Computing                 | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-247   | Numerical and Scientific Computing | DSE-3  | 3 | 1 | 4 | 40  | 60 | 100 |
| <b>Generic Elective (Choose any One)</b>                |                                    |        |   |   |   |     |    |     |
| MCA-249   | Research Methodology               | GE-2   | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-251   | Operational Research               | GE-2   | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-253   | Cyber Security and Cyber Laws      | GE-2   | 3 | 1 | 4 | 40  | 60 | 100 |
| MCA-255   | E-Content Development              | GE-2   | 3 | 1 | 4 | 40  | 60 | 100 |
| <b>Ability Enhancement Compulsory Course</b>            |                                    |        |   |   |   |     |    |     |
| MCA-269   | Minor Project – III                | AECC-6 | 0 | 6 | 3 | 40  | 60 | 100 |
| MCA-271   | Entrepreneurship Mindset (NUES)    | AECC-7 | 3 | 0 | 3 | 100 | -  | 100 |

|   |  |                       |           |           |           |     |    |     |
|---|--|-----------------------|-----------|-----------|-----------|-----|----|-----|
| MCA-273                                       | Professional Proficiency – III (NUES)            | AECC-8                | 0         | 2         | 1         | 100 | -  | 100 |
| <b>Core Course Practical</b>                  |  |                       |           |           |           |     |    |     |
| MCA-261                                       | Design and Analysis of Algorithms Lab.           | Core Course Practical | 0         | 2         | 1         | 40  | 60 | 100 |
| MCA-263                                       | Artificial Intelligence and Machine Learning LAB | Core Course Practical | 0         | 2         | 1         | 40  | 60 | 100 |
| <b>Discipline Specific Elective Practical</b> |  |                       |           |           |           |     |    |     |
| MCA-265                                       | Lab. based on Core Elective – II                 | DSE-2 Practical       | 0         | 2         | 1         | 40  | 60 | 100 |
| MCA-267                                       | Lab. based on Core Elective – III                | DSE-3 Practical       | 0         | 2         | 1         | 40  | 60 | 100 |
| <b>Total Credits</b>                          |  |                       | <b>18</b> | <b>21</b> | <b>31</b> |     |    |     |

#### FOURTH SEMESTER EXAMINATION

| Code No.                                     | Paper  | Course Category | L | T/P | Credits   | Marks Internal | Marks External | Max Marks |
|--|--|-----------------|---|-----|-----------|----------------|----------------|-----------|
| <b>Ability Enhancement Compulsory Course</b> |  |                 |   |     |           |                |                |           |
| MCA-202                                      | Dissertation (Major Project)                                       | AECC-9          | - | -   | 20        | 40             | 60             | 100       |
| MCA-274                                      | Professional Proficiency – IV (Seminar and Progress Report) (NUES) | AECC-10         | - | -   | 4         | 100            | -              | 100       |
| <b>Skill Enhancement Course</b>              |  |                 |   |     |           |                |                |           |
| MCA-272                                      | One MOOC Course (from SWAYAM) (NUES)                               | SEC-1           | - | -   | 2         | 100            | -              | 100       |
| <b>Total Credits</b>                         |  |                 |   |     | <b>26</b> |                |                |           |

#### Non-University Examination System (NUES)

##### Important Notes:

- As mandated by the statutory bodies, every student shall be given 03 weeks induction training in the beginning of the first semester. Detailed guidelines for the same shall be finalized through Programme Co-ordination Committee.
- Institutions shall also be required to facilitate the non-computer science students for successfully completing the Bridge Courses from MOOC platform. If required, Institution may also conduct make-up classes or tutorial sessions for such students.
- In order to conduct classes for Electives (Core or Open), there must be a minimum of 20 students in that Elective. However, if the numbers of students are less than 20 in any of the Electives (Core or Open), the

elective course may still be offered but no classes will be held and the students shall be required to successfully complete that course from the MOOC using SAWAYAM or other similar platforms. In that case, students shall be required to obtain prior approval of the Programme Co-ordination Committee for undertaking any course(s) from the MOOC platforms. Requirement of attendance, to such students, shall be waived off based upon the document of having completed the course from MOOC platforms. MCA-272 shall also be completed from the MOOC using SAWAYAM or other similar platforms, as detailed above. However, students shall be required to appear for the examinations conducted by the Institution as teachers' continuous evaluation to earn these credits. The MOOC course should have at least 30 hours of teaching. No direct credit transfer shall be allowed based upon the Certificate of having completed these elective courses from the MOOC platforms.

4. Detailed modalities of all the NUES Papers and MCA-202 (Dissertation) related guidelines for assessment and evaluation shall be followed as approved by the Programme Co-ordination Committee. The dissertation should be oriented towards socially relevant projects.
5. The total number of the credits of the MCA programme = **116**.
6. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of **104** credits.
7. Evaluation of Bridge Courses shall be based in line with NUES mechanism. Institutions shall send these marks to the University as NUES Course, based upon the final MOOC Certificate. Detailed guidelines shall be approved by the Programme Co-ordination Committee.
8. The programme of study shall be governed by Ordinance 11 of the University.
9. Passing Marks shall be 40 out of 100 marks for every paper.

**BRIDGE COURSE DETAILS  
FOR  
NON-COMPUTER SCIENCE STUDENTS JOINING THE MCA PROGRAMME**

Students from the non-computer Science background joining the MCA Programme will have to pass the following 05 papers from the MOOC using SWAYAM platform, in semester-wise order, as defined by the Programme Co-ordination Committee (considering the pre-requisites of different courses in different semesters) but, not later than the end of the 04<sup>th</sup> Semester. Final Degree shall be awarded only after completion of the following 05 papers:-

| <b>Paper Code</b> | <b>Paper Name</b>                          | <b>Reference of MOOC (on SAWAYAM) Course</b>   |
|-------------------|--|--|
| BCMCA-001         | Fundamentals of Computer Systems           | <b>Course Title:</b> CIT-001: Fundamentals of Computer Systems<br><b>By:</b> Shri. Mangala Prasad Mishra<br><b>Coordinated By:</b> IGNOU<br><b>Course Duration:</b> 08 Weeks<br><b>Link:</b> <a href="https://swayam.gov.in/nd2_nou20_cs03/preview">https://swayam.gov.in/nd2_nou20_cs03/preview</a>                                 |
| BCMCA-002         | Computer Architecture and Organization     | <b>Course Title:</b> Computer Architecture and Organization<br><b>By:</b> Prof. Indranil Sengupta, Prof. Kamalika Datta<br><b>Coordinated By:</b> IIT, Kharagpur<br><b>Course Duration:</b> 12 Weeks<br><b>Link:</b> <a href="https://swayam.gov.in/nd1_noc20_cs64/preview">https://swayam.gov.in/nd1_noc20_cs64/preview</a>         |
| BCMCA-003         | Introduction to Programming in C           | <b>Course Title:</b> Introduction to Programming in C (106104128)<br><b>By:</b> Prof. Satyadev Nandakumar<br><b>Coordinated By:</b> IIT, Kanpur<br><b>Course Duration:</b> 08 Weeks<br><b>Link:</b> <a href="https://swayam.gov.in/nd1_noc20_cs91/preview">https://swayam.gov.in/nd1_noc20_cs91/preview</a>                          |
| BCMCA-004         | An Introduction to Programming through C++ | <b>Course Title:</b> An Introduction to Programming through C++ (106101208)<br><b>By:</b> Prof. Abhiram Ranade<br><b>Coordinated By:</b> IIT, Bombay<br><b>Course Duration:</b> 12 Weeks<br><b>Link:</b> <a href="https://nptel.ac.in/content/syllabus_pdf/106101208.pdf">https://nptel.ac.in/content/syllabus_pdf/106101208.pdf</a> |
| BCMCA-005         | Software Engineering                       | <b>Course Title:</b> Software Engineering<br><b>By:</b> Prof. Rajib Mall<br><b>Coordinated By:</b> IIT, Kharagpur<br><b>Course Duration:</b> 12 Weeks<br><b>Link:</b> <a href="https://swayam.gov.in/nd1_noc20_cs68/preview">https://swayam.gov.in/nd1_noc20_cs68/preview</a>  |

**Notes:**

1. In case of un-availability of any of the above mentioned courses from the MOOC (on SWAYAM platform), the same course(s) may be completed from any other Govt. approved platform, with prior approval from the Programme Co-ordination Committee.
2. The list of non-computer science background students in every admitted batch shall be communicated by the admitting institutions by 4<sup>th</sup> week of starting of academic session to the examination division of the university.
3. Students with BCA/B.Sc.(Computer Science/Information Technology) or equivalent (to be decided by the sub-committee of the program co-ordination committee, at undergraduate level shall be considered as computer science background. All other students shall be considered as non-computer science students.
4. These Courses shall be qualifying in nature; they shall not be included for calculation of CGPA.