



Delhi Skill and Entrepreneurship University

**M.Tech.
(Computer Science and
Engineering with
Specialization in AI and ML)**

Syllabus Document



Effective from Academic Year 2022-23

Program Information

Delhi Skill and Entrepreneurship University offers a two-year Master's Degree Program in Technology (Computer Science and Engineering). The program allows students to train in a promising and job-creating sector. The students will acquire a wide range of skills such as – understanding the technical and functional environment of Computer Science related domains; understanding emerging technologies; learn industry best practices, thereby helping them develop several skills. Students will be exposed to practical knowledge along with the classroom theoretical and practical sessions. The program intends to make a significant contribution toward the development of skilled technical human resource and aid the progress of the nation.

Program Objectives

Delhi Skill and Entrepreneurship University's M.Tech(Computer Science and Engineering with specialization in AI and ML) program provides the students with an in-depth understanding of key theoretical concepts and intensive practical training to enable them to emerge as proficient engineers in Computer Science and Engineering.

The program will help in developing an ability to formulate mathematical models and problem-solving skills through programming techniques for addressing real-life problems using appropriate knowledge representation, problem-solving, and learning methods. Students will become familiar with the insights of Artificial Intelligence and Machine Learning towards problem-solving, inference, perception, knowledge representation, and learning. Also, the ability to bring out the capabilities for research and development in contemporary issues and to exhibit the outcomes such as a technical report is one of the main objectives.

Pedagogy and Teaching Methodology

Developed with the support of experts from the industry and subject matter experts from several renowned academic institutions, this program's effective pedagogy, will aid in skilling young professionals. Focus on real-world examples, activity-based learning, in-campus laboratory training, and internships will lead to the holistic development of students pursuing this course. This will give them much-needed practical exposure that is currently lacking across most institutions. Classroom training is interspersed with industry visits, guest lectures and project assignments.

Credit scheme

| Semester I | | | |
|--------------|--------------|---|---------------|
| Sl No. | Course Code | Course Name | Total Credits |
| 1. | MT-CS-ES-101 | Mathematical Foundation of Computer Science | 3 |
| 2. | MT-CS-ES-102 | Advanced Data Structure and Algorithms | 5 |
| 3. | MT-CS-BS-101 | Research Methodology and IPR | 2 |
| 4. | MT-CS-PE-1XX | Programme Elective-I # | 3/5 |
| 5. | MT-CS-PE-1XX | Programme Elective-II# | 3/5 |
| 6. | MT-CS-AU-101 | Personality Development through Life Enlightenment Skills. (Audit Course-I) | 0 |
| Total | | | 18 |

Note

- 1) *Lab based on either elective.
- 2) #At least one elective course from programme elective-I & II may be offered from MOOCS
- 3) For the audit course – I, its credits are zero, but one needs to qualify with 50% marks.

| List of Programme Electives Semester I | | | |
|---|--------------|---------------------------------|---------------|
| Sl No. | Course Code | Course Titles | Total Credits |
| Programme Elective-I (Choose any one from the following subjects) | | | |
| 1. | MT-CS-PE-101 | Data Warehousing and Mining | 5 |
| 2. | MT-CS-PE-102 | Advanced Computer Networks | 5 |
| 3. | MT-CS-PE-103 | Information Retrieval Systems | 5 |
| 4. | MT-CS-PE-104 | Natural Language Processing | 5 |
| Programme Elective-II (Choose anyone from the following subjects) | | | |
| 5. | MT-CS-PE-105 | Data Preparation and Analysis | 5 |
| 6. | MT-CS-PE-106 | Network Security & Cryptography | 5 |
| 7. | MT-CS-PE-107 | Recommendation Systems | 5 |
| 8. | MT-CS-PE-108 | Human Computer Interaction | 5 |

| Semester II | | | |
|--------------|--------------|---|--------------|
| SI No. | Subject Code | Course Titles | Total Credit |
| 1. | MT-CS-ES-201 | Machine Learning | 5 |
| 2. | MT-CS-ES-202 | Soft Computing | 3 |
| 3. | MT-CS-PE-2XX | Programme Elective-III | 3/5 |
| 4. | MT-CS-PE-2XX | Programme Elective-IV | 3/5 |
| 5. | MT-CS-SM-201 | Seminar | 2 |
| 6. | MT-CS-AU-201 | Technical Writing Skill (Audit Course-II) | 0 |
| Total | | | 18 |

Note:

- * Lab based on either elective.
- For audit course – II, its credits are zero, but one needs to qualify with 50% marks.
- At least one elective course from programme elective-III & IV needs to be offered from MOOCs.

| Semester III | | | |
|--------------|--------------|----------------------------------|---------------|
| SI No. | Subject Code | Course Titles | Total Credits |
| 1. | MT-CS-PE-3XX | Programme Elective-V | 3 |
| 2. | MT-CS-OE-3YY | Open Elective | 3 |
| 3. | MT-CS-PR-301 | Dissertation /Industrial Project | 10 |
| Total | | | 16 |

Note: Dissertation / Industrial Project (MT-CS-PR-301)

A student needs to select a topic related to Computer Science & Engineering/ its applications with specialisation in AI and ML to carry out their dissertation/Industrial project. The dissertation can be research-oriented, model design based, analytical work, simulation, or a combination in the emerging areas/applications of Computer Science & Engineering with specialisation in AI and ML under the supervision of a CSE faculty (single or jointly). One needs to submit a synopsis in the prescribed format with the consultation of her/her supervisor/s at the beginning of the semester for approval by the Departmental committee meant for the same. S/he would need to present a progress report in front of the committee from time to time. The end semester evaluation shall be on the basis of viva-voce and project report. One needs to complete the

remaining two courses of semester III through MOOCS compulsorily:-

| Semester IV | | | |
|--------------|--------------|---------------|---------------|
| SI No. | Subject Code | Course Titles | Total Credits |
| 1. | MT-CS-PR-401 | Dissertation | 16 |
| Total | | | 16 |

Note: Dissertation (MT-CS-PR-401)

One needs to extend the project work taken in 3rd semester for the dissertation to complete the work planned in the third semester, attaining all the objectives and needs to prepare a report for the entire work done in 3rd and 4th semester at the end of 4th semester. Students should be encouraged to communicate their ideas and results in reputed conferences and/or journals. One needs to present his/her work before the committee for final evaluation at the end of the 4th semester.

| List of Programme Electives | | | |
|--|--------------|---------------------------------|---------------|
| SI No. | Course Code | Course Titles | Total Credits |
| Programme Elective-I (Choose any one from the following subjects) | | | |
| 1. | MT-CS-PE-101 | Data Warehousing and Mining | 5 |
| 2. | MT-CS-PE-102 | Advanced Computer Networks | 5 |
| 3. | MT-CS-PE-103 | Information Retrieval Systems | 5 |
| 4. | MT-CS-PE-104 | Natural Language Processing | 5 |
| Programme Elective-II (Choose any one from the following subjects) | | | |
| 5. | MT-CS-PE-105 | Data Preparation and Analysis | 5 |
| 6. | MT-CS-PE-106 | Network Security & Cryptography | 5 |
| 7. | MT-CS-PE-107 | Recommendation Systems | 5 |
| 8. | MT-CS-PE-108 | Human-Computer Interaction | 5 |
| Programme Elective-III (Choose any one from the following subjects) | | | |
| 9. | MT-CS-PE-201 | Data Visualization | 5 |
| 10. | MT-CS-PE-202 | Mobile and Wireless Networks | 5 |
| 11. | MT-CS-PE-203 | Pattern Recognition | 5 |
| 12. | MT-CS-PE-204 | Social Networks | 5 |

| Programme Elective-IV (Choose any one from the following subjects) | | | |
|---|--------------|---|---|
| 13. | MT-CS-PE-205 | Big Data Analytics | 5 |
| 14. | MT-CS-PE-206 | Sensor Networks | 5 |
| 15. | MT-CS-PE-207 | Digital Image Processing | 5 |
| 16. | MT-CS-PE-208 | Optimization Techniques | 5 |
| Programme Elective-V (Choose any one from the following subjects) | | | |
| 17. | MT-CS-PE-301 | Operation Research | 3 |
| 18. | MT-CS-PE-302 | Cloud computing | 3 |
| 19. | MT-CS-PE-303 | Internet of Things | 3 |
| 20. | MT-CS-PE-304 | Embedded system | 3 |
| Open Elective (Choose any one from the following subjects) | | | |
| 21. | MT-CS-OE-301 | Business Analytics | 3 |
| 22. | MT-CS-OE-302 | Industrial Safety | 3 |
| 23. | MT-CS-OE-303 | Cost Management of Engineering Projects | 3 |
| 24. | MT-CS-OE-304 | Composite Materials | 3 |
| 25. | MT-CS-OE-305 | Waste to Energy | 3 |