INDRAPRASTHA INSTITUTE of INFORMATION TECHNOLOGY DELHI

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Regulations for M.Tech. in Computer Science and Engineering with Specialization in Artificial Intelligence

1. Preamble

IIIT-Delhi subscribes to the view that a Master's degree is primarily industry-focused, though it can be used as a stepping stone for research as well. The decision whether the degree is to be pursued for skill and knowledge up-gradation or also for building research skills should rest with the student.

2. Program Educational Objectives

The main PEOs of the program are to produce graduates that are well prepared:

- PEO 1: to undertake industry careers involving innovation and problem solving using Artificial Intelligence (AI) and Machine Learning (ML) technologies.
- PEO 2: to undertake research careers in AI, ML, and, in general, Computer Sciences areas
- PEO3: to contribute to society by becoming a model professional who can communicate effectively and follows ethical behavior

3. Program Outcomes:

The main outcomes of the M.Tech. in CSE with specialization in AI program are given here. At the end of the program a student is expected to have an ability to:

- PO 1: recognize and analyze problems related to AI and ML applications along with their ethical implications
- PO 2: apply pattern recognition, machine learning, and artificial intelligent techniques including statistical data analysis and quantitative modeling techniques to solve real world problems from various domains such as healthcare, social computing, economics, etc.
- PO 3: utilize cutting edge tools and software in AI and ML
- PO 4: build novel algorithms or modify/improve existing approaches in AI and ML
- PO 5: demonstrate knowledge by communicate findings and effectively present results
- PO 6: understand latest development and progress in AI and ML areas

4. General Requirements

1. Entry qualification for this specialization will be the same as for M.Tech. CSE.

2. M.Tech. in CSE with specialization in Artificial Intelligence (AI) will have four types of courses:
   (i) Core AI courses,
   (ii) Core AI electives,
   (iii) Regular AI electives, and
   (iv) Open electives.
   M.Tech. may be done with a thesis, or without a thesis (Capstone Project option). In both the options, a student must complete 12 credits of core AI courses, at least 8 credits from core AI electives, and at least 4 credits from regular AI elective, and may choose the remaining from open electives as discussed below.
3. A student not fulfilling the specialization requirement can be considered for M.Tech. CSE (GEN) degree provided she/he fulfills other requirements. For such students, courses taken as core courses for M.Tech. CSE (AI) can be counted as bucket courses for M.Tech. CSE (GEN).
4. The overall credit requirement for the M.Tech. is 48 credits. Requirements for thesis and Capstone Project options are as follows:
   a. With Thesis option: 32 credits of coursework + 16 credits of thesis. At most 4 credits may be earned by doing 300 and 400 level courses.
   b. Without thesis option: 40 credits of coursework + Capstone Project (8 credits). At most 8 credits may be earned by doing 300 and 400 level courses. A student opting for without thesis option can also be permitted to do Capstone project of 4 credits with 44 credits course work.
5. This program does not allow Industrial Project or Scholarly Paper option.
6. A student admitted to the M.Tech. program will give his/her choice regarding whether he/she wants to pursue the thesis or without thesis (Capstone) option. However, this choice can be changed at any time during the program by suitably informing the PG Committee. Credits earned for Capstone Project or Thesis may be counted towards thesis or Capstone Project respectively, if approved by the PGC.

Core AI Courses – A student is required to complete 12 credits of core AI courses:

- Artificial Intelligence
- Introduction to Graduate Algorithms or Modern Algorithm Design (MAD) or Theoretical Machine Learning (TML) (one of these)
- Statistical Machine Learning or Machine Learning (either one of these)

Core AI Electives – A student is required to complete minimum 8 credits (12 credits for Capstone Project option) from below:

- Advanced Machine Learning
- Deep Learning
- Machine Learning

- Multi-Agent Systems
- Probabilistic Graphical Models
- Reinforcement Learning
- Statistical Machine Learning
- Theoretical Machine Learning

Regular AI Elective - A student is required to complete at least 4 credits (8 credits for Capstone Project option).

- All of the above and
- Advanced Biometrics
- Advanced Computer Vision
- Computer Vision
- Data Mining
- Image Analysis
- Information Retrieval
- Linear Optimization
- Natural Language Processing
- Probability and Random Processes
- Robotics
- Speech Recognition and Understanding
- Any future Artificial Intelligence-Machine Learning courses

Open Electives:

- A student can take up to 8 credits of open electives
- All of the above and any CS course
- In electives, at most 4 credits of "Independent Study" and 4 credits of "Minor Project" can be taken.
- Online course may be permitted to be registered as Independent study/minor project with permission of PGC.

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