Computer Science Engineering - NorthCap University

B.Tech CSE - Artificial Intelligence and Machine Learning

About

"**Predicting the future isn't magic, it's artificial intelligence**." – **Dave Waters**

Artificial Intelligence and Machine Learning (AI and ML) have transformed our lives. We can't even think of a day when some sort of AI technology is not assisting us. From spam filters and smart replies in Gmail to mobile banking, Google maps Siri, Alexa, Autonomous Cars, Robotic Vacuum to name a few. AI and ML have not left even a single stone unturned to reach where it is at the moment. Automation that is enhanced through artificial intelligence (AI) is critical to organizations' ability to compete and survive in the years ahead, according to nearly 400 business leaders recently surveyed by Harvard Business Review. Artificial intelligence isn't just a prevailing fashion. It's setting down deep roots and as a premier top Computer Science Engineering College in Delhi NCR, we understand this better than anyone else. There is an increasing need for intelligent and accurate decision-making across industries. This has led to an exponential growth in the adoption of AI and ML technologies which is likely to remain prevalent in the years to come. By the year 2022 AI-ML market size is likely to be $8.81 billion. And, this means that the industry will surely need a skilled workforce to build, test and deploy more and more artificial brains around the world. This course – CSE with specialization in Artificial Intelligence and Machine Learning enables the students to master the essential skills and equip them to be a part of the global workforce. As one of the best Computer Science Engineering Colleges in Delhi, we believe this specialization in CSE will help change the world. If you are interested in a career in artificial intelligence, then you're in the right place, with The NorthCap University. A career in artificial intelligence has a variety of fields including private companies, public organizations, education, healthcare facilities, government agencies, and the military.

Learning outcomes of this track:

- To Understand and implement search and adversarial (game) algorithms
- To formulate mathematical models such as belief networks and Markov decision methods in the data driven decision making.
- To explore supervised, unsupervised and reinforcement learning and apply them to a range of AI problems.
- To understand the probabilistic foundations and learning algorithms for deep neuralnetworks models.
- To learn and implement the basic methodologies and tools in robotics research and applications
- To explore the fundamental concepts of NLP and its role in current and emerging technologies.

Career Options:

- Machine Learning Engineer
- Research Scientist
- Software analysts and developers
- Data Engineer

Prospective Companies for B.Tech (CSE) (AI and ML):

- Qualcomm

- Dell, Capgemini
- Accenture
- VMware
- Springer Nature Technology and Publishing
- IBM, Naukri.com
- Analytics Vidhya Educon
- TATA Industries Ltd.
- Rolls Royce
- Philips
- Oracle
- American Express

Programme Educational Objectives (PEOs)

- To provide an in-depth understanding of the fundamentals of Computer Science and create a foundation of lifelong learning to facilitate progressive careers in industry and in pursuit of higher studies.
- To equip our students with technical and analytical skills to develop innovative solutions to complex real life problems using existing and novel technologies.
- To equip our students with sufficient communication & interpersonal skills, multi-disciplinary teamwork, and leadership skills to enable them to fulfil professional responsibilities.
- To expose them to various contemporary issues which will enable them to become ethical and responsible towards themselves, co-workers, the Society, and the Nation.

Programme Outcomes (POs)

Engineering Graduates will be able to:

- **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural and engineering sciences.
- **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet a specific requirement with appropriate consideration for the public health and safety and the cultural, societal, and environmental considerations.
- **Conduct investigations for the complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
- **Modern tool usage:** Create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.
- **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
- **Professional Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

- **Individual and teamwork:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
- **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, making effective presentations, and give and receive clear instructions.
- **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work being a member and leader in a team, to manage projects and in multidisciplinary environments.
- **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broad context of technological change.

Programme Specific Outcomes

PSO 1 Understand the fundamental concepts of Computer Science & Engineering with specialized engineering knowledge in the areas of data science, artificial intelligence, full stack, web development, gaming, augmented reality and virtual reality.

PSO 2 Design and Integrate hardware and software systems in the areas of IOT, cloud computing, cyber security with strong emphasis on lifelong learning to create feasible engineering solutions for the advancement of society.

PSO 3 Enable the students for premium National/International jobs, higher education, entrepreneurship and to become responsible global citizens.

Scheme 2022 -2023

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Syllabi & Course Outcomes

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