



"AI is probably the most important thing humanity has ever worked on"

Sundar Pichai  
CEO Google



"Intelligence is the ability to adapt to change"

Stephen Hawking



# B.TECH (CSE) ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING PROSPECTUS 2020



**ARAVALI**  
COLLEGE OF ENGINEERING & MANAGEMENT  
creating achievers

[www.acem.edu.in](http://www.acem.edu.in)



## About The College

Aravali College of Engineering and Management was founded in the year 2008 with a vision to become one of the finest institution in the country, in the field of technical education and research; through focused, effective and sustained efforts and programmes. The main aim of the institute is to provide excellent quality technical and managerial education not only to the students from Delhi/NCR region but also from all over the world.

It is promoted by a visionary educationist, Shri. Dhan Singh Bhadana, who is also the Chairman of the Aravali Eduworld which includes a bouquet of international schools namely as Aravali International School, Aravali College of Engineering and Management, Aravali Institute of Competitive Studies & Aravali College of Advanced Studies in Education. A part of his vision is to impart education to needy and economically poorer sections to facilitate their participation and development in the society, for this various awards and schemes are being offered by the college.

Shri. Bhadana's vision is to provide students with quality education, enable them to succeed and excel in their chosen fields of career progression, and thereby stand apart as distinguished examples of superior education. ACEM is committed to impart quality education that transforms students into responsible self-reliant and confident citizens of the future. Diversity and inclusion in all of its forms are appreciated and celebrated at Aravali.

## Chairman's Message



**Shri Dhan Singh Bhadana**  
**Chairman**

As we all know that education, business, profession, in fact, everything is changing at a fast pace globally. We need to be right there or we will be left behind. Hence the need arises to impart high-quality education along with the latest infrastructure, that is what our college focuses on and we know that by putting the right people on the job we can make it the biggest success story of our times. Our focus is on a balanced education that encompasses the tradition of ethics and on the needs of a changing world.

The main goal is that the child not only becomes a successful individual in this vibrant and dynamic environment but also becomes a better human being that will make him responsible and a good citizen upholding our values and ethics while maintaining their separate identity. The College aims at complete holistic development of a child. Our emerging profile is to equip our students and teachers with talent.

Technologies and resources are developed so that they are ever ready to help our corporate sectors and for emerging as the leaders in the global market. I invite you to explore this unique and fulfilling field of study and join hands to realize the dream of becoming the next knowledge superpower. Looking forward to your co-operation.

The greatest gifts you can give your children are the roots of responsibility and the wings of Independence. Today, more than at any time in history, technology is changing. It has the power to transform economic, social, cultural and environmental situations of our country, so that our countrymen may have food, shelter, education, healthcare and employment within a given time-frame. Aravali College of Engineering and Management, Faridabad, is dedicated to the task of making India a knowledge society; to create scientists, engineers and managers of proven capability.

## Director's Message



**Prof (Dr.) Suresh Kumar Jindal**  
**M.Tech. (IIT Kharagpur), Ph. D**  
**Director Principal**

Dear Student,

Congratulations on joining the Aravali College of Engineering and Management family. I am delighted to welcome you to the CEM, where we pursue excellence in all the institute activities in an attempt to transform young students into responsible and professional engineers/managers with a sense of social responsibility, human values and concern for the environment. Today, as our society becomes increasingly global, diverse, and technologically complex, we continue to find innovative ways to provide education that will equip you to make your mark on the world.

CSE Artificial Intelligence & Machine Learning is a 4 year undergraduate course of Computer Science & Engineering with specialization in AI & Machine Learning. The course is designed to make professionals technically sound in advanced learning systems that are based on algorithm of Artificial Intelligence. AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behaviour, whereas, machine learning is an application or subset of AI that allows machines to learn from data without being programmed explicitly.

This specialisation is designed to enable students to build intelligent machines, software, or applications with a cutting-edge combination of machine learning, analytics and visualisation technologies. The main goal of artificial intelligence (AI) and machine learning is to program computers to use example data or experience to solve a given problem. Many successful applications based on machine learning exist already, including systems that analyse past sales data to predict customer behaviour (financial management), recognize faces or spoken speech, optimize robot behaviour so that a task can be completed using minimum resources, and extract knowledge from bioinformatics data.

This programme is for students who want to acquire the ability to design intelligent solutions to problems in a variety of domains and business applications and fields such as natural language processing, text mining, robotics, reasoning, problem-solving and pursue a career with exceptional prospective fields and challenging roles in a futuristic industry. The financial security, the freedom to relocate, lifelong prospects of learning makes this programme an ideal career for computer science enthusiasts.

This programme discusses AI & ML methods based in different fields, including neural networks, signal processing, control, and data mining, in order to present a unified treatment of machine learning problems and solutions. The curricula are created with intent to educate the engineering students on cutting-edge technologies. This courseware is going to teach the engineering students on Mathematical Foundations, Statistical Foundations, and Applied Artificial Intelligence. The department encourages students to participate in research and live projects under the guidance of faculty members. Students are motivated and encouraged to work on state of the art research and projects. The department aims to provide amenities for the students in every possible way and groom them for a successful life ahead. The department maintains its relationship with different industry and renowned institute for conduct of courses to enhance the technical skills of the students and make them industry ready. Students of the department are engaged in research oriented as well as industry oriented projects. During the project, the students get an opportunity to gain experience by working closely with an experienced industry mentor and apply what they learn during their last seven semesters in the classroom.

DUBLIN--(BUSINESS WIRE)--The "Machine Learning Market in India (2018-2023)" report has been added to ResearchAndMarkets.com's offering. In India, investments in artificial intelligence (which was INR 773.64 Bn in 2017) is expected to expand at a CAGR of 33.49% during the 2018-2023 period. Machine learning (ML) is an emerging Artificial Intelligence (AI) technology which is being adopted aggressively by retail, transportation (especially airlines), and financial services companies operating in India. In 2018, this resulted in the creation of about 180,000 to 200,000 new jobs for professionals who have skills and expertise in Artificial Learning & Machine Learning applications. The AI & ML salary for freshers in India starts at around Rs. 6 LPA and can stretch up to Rs. 12 LPA, with higher-end salaries usually offered by reputed companies like Amazon, Flipkart, Google, Facebook, etc. As for Machine Learning roles, the starting salary for freshers is generally Rs. 8 LPA, and it can go up to Rs. 10-15 LPA, depending upon the job role and skill set.

## HOD Message



**Dr. Manoj Wadhwa**

**HOD**

Dear Parents and Students

Greetings!

It is my pleasure to share with all of you that CSE department at ACEM has started one more core branch in CSE with specialization in Artificial Intelligence and Machine Learning (AI & ML) from the academic session 2020-21. The programme CSE with specialization AI & ML has an intake of 30 students and is approved by AICTE, New Delhi and recognised by J.C. Bose University of Science and Technology, YMCA Faridabad. This programme is surely going to draft the script for a new chapter in the history of ACEM since it is a much sought-after skill set for the future. The primary focus of the curriculum is to impart technical know-how to the students, promote their problem-solving skills and innovation of new technologies introducing new developments. The department has state-of-the-art infrastructure facilities to support our academic programmes and research.

It is heartening to find that our students look forward to contributing to solving the technological challenges of society with active participation, perseverance, and hard work. Skill & knowledge relevant to real-world problems is inseminated to produce dynamic, socially conscious, and sensitive human beings.

Artificial Intelligence (AI) is concerned with the development of systems that exhibit behaviour typically associated with human cognition such as perceiving, learning, communicating, reasoning, making decisions, and acting in a physical and social environment. AI curriculum is focused on machine learning, natural language and speech processing, computer vision, robotics, and security etc.

Machine Learning (ML) is a fascinating field of Artificial Intelligence (AI) research and practice where we investigate how computer agents can improve their perception, cognition, and action with experience. Machine Learning utilizes a variety of techniques to intelligently handle large and complex amounts of information build upon foundations in many disciplines including statistics, knowledge representation, planning and control, databases, causal inference, computer systems, machine vision, and natural language processing.

Today, Artificial Intelligence & Machine Learning have impact on many applications relying on all sorts of data, basically any data that is recorded in computers, such as health data, scientific

data, financial data, location data, weather data, energy data etc. Nowadays, Artificial Intelligence & Machine Learning has become very crucial for most of our current and future applications. In such a scenario, ACEM accepts the challenge to start 4 year undergraduate programme in CSE (AI & ML).

## About the Programme

B. Tech. in CSE (Artificial Learning and Machine Learning) is an undergraduate programme with advanced learning solutions imparting knowledge of advanced innovations like artificial intelligence, machine learning and deep learning.

This specialization is designed to enable the students to build intelligent machines, software, or applications with a cutting-edge combination of machine learning, analytics and visualization technologies.

The main goal of artificial intelligence and machine learning is to program computers to use example data or experience to solve a given problem.

Many successful applications based on artificial intelligence and machine learning already exist, including systems that analyze past sales data to predict customer behaviour (financial management), recognize faces or spoken speech, optimize robot behaviour so that a task can be completed using minimum resources, and extract knowledge from bioinformatics data.

This programme discusses AI methods based in different fields including neural network, signal processing, image processing, speech recognition and data mining in order to present a unified treatment of machine learning problems and solutions.

Artificial Intelligence and Machine Learning is currently the hot topic and probably the most sought out discipline in both Industry and Academics. Most of the IT companies like Microsoft, Google, AMAZON, Tesla, NVIDIA and many more have adapted this concept in their system.

## Objective of the Programme

**Artificial Intelligence** is the broader concept of machines being able to carry out tasks in a way that we would consider “smart”. Artificial intelligence is the intelligence exhibited by machines or software. It is the branch of computer science that emphasizes on creating intelligent machines that work and reacts like humans.

**Machine Learning** is a current application of AI based around the idea that we should be able to give machines access to data and let them learn for themselves. Artificial Intelligence spans a wide variety of topics in computer science research including machine learning, deep learning, reinforcement learning, natural language processing, reasoning, perception etc.

## Career options in CSE (AI & ML)

It is said that jobs and career options in the field of artificial intelligence are estimated to witness an increase of 2.3 million positions by the end of the year 2030. Many companies that use Artificial Intelligence technologies have agreed to the fact that AI is contributing to the creation of new job opportunities and positions in the technology sector. Artificial Intelligence is already being used for a vast variety of applications for the purpose of making smarter computers. Some of the Artificial Intelligence jobs that a candidate can apply for after completing the course in AI are:

- Video Game Programmer
- Machine Learning Researcher
- Robotics Programmer
- Software Engineer
- Data Mining Analyst
- Military Services
- Machine Learning Engineer
- Data Scientist
- Business Intelligence Developer
- Research Scientist
- Big Data Engineer
- Big Data Architect

The Topmost companies such as Amazon, Facebook, Google, Microsoft, Uber, Lenovo, Samsung, IBM, Accenture, Intel, Adobe, etc. hire candidates (on large scales) who have specialisation in Artificial Intelligence. The scope of AI is increasing with great speed and many job opportunities have opened up for the candidates with knowledge of AI. The salaries of Artificial Intelligence professionals vary from position to position and company to company. The starting salary of an AI expert in a top multinational company is around Rs. 90 lakhs per annum. The pay scale increases considering the knowledge, area of expertise, work experience, and other such important professional factors.

# *The* **Communique**

Department of Computer Science  
Artificial Intelligence And Machine Learning



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