

Additional information regarding colleges offering professional course in AI.

- ✓ IIT Madras – Four year Bachelor of Science Degree in Data Science and Applications
<https://study.iitm.ac.in/ds/>
- ✓ AICTE – All India Council for Technical Education’s unique website – “Digital Skilling”.
Explore this site for a wide variety of course and internships. <https://1crore.aicte-india.org/>
- ✓ Most of the top colleges in India now offer B.Tech courses in AI and ML, Data Science, Robotics and Computer Science with specializations. Students can visit college websites to know more about these courses. Also, some colleges are offering BSc in AI and ML.

REFERENCES : [IBM Skills Build](#)

EXERCISES:

A. Multiple Choice Questions

1. Which of the following is a job role in AI related to the automobile industry?
 - A. Robotics Engineer
 - B. Virtual Nurse Assistant
 - C. Sales Forecasting Analyst
 - D. Autonomous Vehicle Engineer
2. Identify the important soft skill required for AI professionals.
 - A. Expertise in neural networks
 - B. Effective communication
 - C. Proficiency in Python
 - D. Knowledge of big data technologies
3. Which industry uses AI for personalized travel recommendations?
 - A. Tourism
 - B. Banking
 - C. Healthcare
 - D. Geospatial
4. What is the purpose of the website “Data Science Central”?
 - A. Providing a community experience for data practitioners
 - B. Offering free video-based courses on AI
 - C. Analyzing market trends using AI algorithms
 - D. Providing insight into emerging trends in big data
5. Which industry uses AI for market analysis and fraud detection?
 - A. Finance
 - B. Media
 - C. Textile
 - D. Design

ANSWERS

1. D. Autonomous Vehicle Engineer
2. B. Effective communication
3. A. Tourism
4. A. Providing a community experience for data practitioners
5. A. Finance

B. Short answer questions:

1. Name some common job roles in the field of artificial intelligence (AI).

Some common Job roles in AI are Machine Learning Engineer, Data Scientist, Business Intelligence Developer, Robotics Engineer, Software Engineer, NLP Engineer, Computer Vision Engineer, AI ethicist, AI consultant

2. What are some essential technical skills required for a successful career in AI, and why are they important?

Some important technical skills required are expertise in neural networks, machine learning, and deep learning, knowledge of big data technologies and techniques, understanding of frameworks and libraries like TensorFlow, SciPy, and NumPy, familiarity with programming languages such as Python, R, Java, and C++, proficiency in linear algebra, probability, statistics, and signal processing.

By acquiring the right combination of technical skills and tools, aspiring AI professionals can position themselves for success in this dynamic and rapidly growing field.

3. What is the role of AI professionals in healthcare, finance, and retail industry?

In Healthcare:

1. Medical Imaging Analyst: Analyzes medical images using AI algorithms.
2. Virtual Nurse Assistant: Provides personalized healthcare recommendations.
3. Drug Discovery Researcher: Identifies potential drug candidates using AI.

In Finance

1. Quantitative Analyst: Analyzes market trends using AI algorithms.
2. Fraud Detection Analyst: Identifies fraudulent activities using AI models.
3. Financial Advisor: Offers personalized investment recommendations using AI-driven analytics.

In Retail Industry

1. Inventory Management Specialist: Optimizes inventory levels using AI algorithms.
2. Sales Forecasting Analyst: Forecasts sales using AI models.
3. Customer Experience Designer: Enhances customer experience using AI-driven insights.

4. List some popular AI tools and programming languages used by AI professionals.

Some of the popular AI tools are Tensor Flow, SciPy and NumPy. Programming Languages used by AI professionals are Python, R, Java, C++.

5. What soft skills do AI professionals need, and how do they help them succeed?

Soft skills needed by AI professionals are:

- Effective communication skills
- Strong teamwork and collaboration
- Problem-solving, decision-making, and analytical thinking skills
- Time management and organizational skills
- Business intelligence and critical thinking skills

Acquiring soft skills helps professional develop the personality and thus work better

6. Why is continuous learning crucial in AI, and how do professionals stay updated with the latest advancements?

Continuous learning is crucial in AI due to the rapid pace of advancements and innovations in the field. Evolution of techniques, new research findings, addressing ethical and social implications have made continuous AI learning crucial.

Professionals stay updated with the latest advancement through continuous education, research and publications, online resources, community involvement, Hands-on projects.

C. Long answer questions.

1. How does the global demand for AI professionals affect career opportunities in the field?
The global demand for AI talent is skyrocketing, driven by the rapid pace of technological advancements and the increasing integration of AI solutions into diverse sectors. From healthcare and finance to transportation and retail, organizations are harnessing the power of AI to streamline operations, optimize processes, and deliver enhanced services to consumers.

One of the most significant advantages of pursuing a career in AI is the sheer breadth of opportunities it offers. Whether you are passionate about machine learning, natural language processing, robotics, or data analytics, there is a niche within the AI field suited to your interests and skills.

Moreover, as AI technologies continue to mature, new specialties and job roles are emerging, creating avenues for specialization and expertise.

2. What are some common job roles in the field of AI, and how do they contribute to the development and implementation of AI solutions across various industries?

Some common job roles include:

- **Machine Learning Engineer:** Machine learning engineers bridge software engineering and data science, utilizing big data tools and programming frameworks to develop scalable data science models capable of handling vast volumes of real-time data.
- **Data Scientist:** Data scientists leverage machine learning and predictive analytics to extract insights from large datasets, informing business decisions.

- **Business Intelligence Developer:** Business intelligence (BI) developers design, model, and maintain complex data sets to analyse business and market trends, enhancing organizational profitability and efficiency.
- **Robotics Engineer:** They design and maintain AI-powered robots, develop mechanical devices capable of performing tasks with human commands.
- **Software Engineer:** AI software engineers build and maintain software products for AI applications, staying updated on the latest artificial intelligence technologies.
- **Natural Language Processing (NLP) Engineer:** NLP engineers specialize in human language processing, working on voice assistants, speech recognition, and document processing.
- **Computer Vision Engineer:** Computer vision engineers specialize in developing algorithms and systems that enable computers to analyse and interpret visual information from images or videos.
- **AI Ethicist:** AI ethicists address ethical considerations and implications related to the development and deployment of AI technologies, ensuring that they are used responsibly and ethically.
- **AI Consultant:** AI consultants offer expert guidance and advice to organizations on how to leverage AI technologies to solve business challenges and drive innovation.

Competency Based Questions

1. Medha just finished her Class X exams and dreams of a career in AI for Finance. She's unsure what subjects to choose in higher studies (Class XI & XII) to prepare for this future goal. What subjects would you recommend for Medha to take in school, and are there any additional courses she can consider to strengthen her profile?

Ans- Medha can combine her AI aspirations with a finance career. In school, she should focus on Math, Computer Science, and Commerce subjects (Accountancy, Economics, Business Studies). Additionally, online courses on platforms like Kaggle, Udemy, and Data Science programs can provide valuable technical skills and bridge the gap between finance and AI. This combination will equip her for a successful future in AI for Finance.

2. Akash, a recent graduate, just joined the IT and AI startup company as a software developer. He's brilliant at coding but feels a bit nervous about collaborating with his new team. He feels explaining technical concepts to non-technical team members and clearly documenting code could be a challenge. Also, he's not sure how to effectively collaborate with others and handle situations where there might be disagreements about the best approach. List some soft skills that can help him excel in this environment:

Ans:

- **Effective Communication:** Being able to explain complex technical ideas in clear and concise language, both verbally and in writing, is crucial.
- **Teamwork and Collaboration:** Success in an AI startup often depends on working effectively with others. Actively listen to your colleagues, share ideas openly, and be willing to compromise when necessary.
- **Problem-solving:** AI projects often involve unexpected hurdles. Develop a logical approach to problem-solving, considering different solutions and collaborating with your team to find the best approach.

3. Saloni, a career counselor, is visiting a Class XII assembly to talk about exciting career opportunities in Artificial Intelligence (AI). After explaining various AI fields, a student named Aditya raises his hand and asks, "This all sounds fascinating, but how is AI being used in healthcare specifically?" How will Saloni address Aditya's query?

Ans- Saloni addressed Aditya's query by showcasing how AI is revolutionizing healthcare through tasks like medical image analysis, drug discovery, virtual assistants, robotic surgery, predicting health risks, and automating administrative tasks. This highlights the vast potential of AI careers at the intersection of technology and medicine.

4. Naveen is a student. Help him to differentiate the commonly used AI tools, platforms and programming languages used for the development of AI applications.

Python, GW-BASIC, R, MS-Word, IBM Watson, TensorFlow, MS-Paint, SciPy, Perl.

Ans: Python, R, IBM Watson, TensorFlow and SciPy.

5. Mr. Sourav Shukla is a journalist and owns a media house. He wants to leverage AI in his field. List some employment opportunities and some job roles related to the field of media.

Ans: Visual effects, content generation, and audience analysis. Job roles are: Visual Effect Artist, Content Creator, Audience or Data Analyst, and targeted advertising.