Artificial Intelligence Engineer

Master's Program

Exposure to prominent tools:
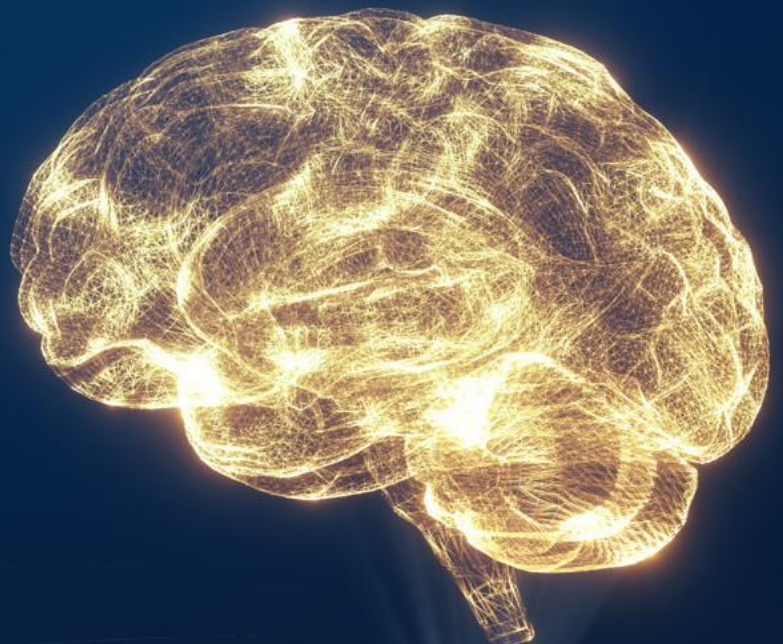
Bard   DALL·E 2

ChatGPT   Midjourney

and more

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About the Program

This Artificial Intelligence Engineer program, in collaboration with IBM, offers a comprehensive curriculum covering Generative AI, ChatGPT, Python for Data Science, Applied Data Science, Machine Learning, Deep Learning, and advanced topics such as Advanced Deep Learning, Computer Vision, Natural Language Processing, and Reinforcement Learning.

Through practical applications and hands-on projects, learners acquire expertise in AI techniques, data analysis, and model building using Python, TensorFlow, Keras, and PyTorch. The capstone project allows applying acquired skills to solve real-world challenges, showcasing proficiency to potential employers. Electives provide specialized insights into complex areas like computer vision, NLP, and RL, enabling students to excel in diverse AI domains. This program equips learners with a robust skill set, preparing them for impactful roles in the AI and ML landscape.

Key Features of the Program

AI Engineer Program completion certificate.

Core curriculum delivered in live-online classes by industry experts.

3 Capstones and 25+ hands-on projects from various industry domains.

Live interactive sessions on the latest AI trends, such as ChatGPT, Generative AI, prompt engineering, and more.

Gain exposure to TensorFlow, Keras, ChatGPT, OpenAI, Dall-E and other prominent tools.

Industry masterclasses delivered by experts from IBM.

Earn IBM certificates for IBM courses.

Simplilearn's career services help you get noticed by top hiring companies.

Exclusive hackathons and Ask Me Anything sessions by IBM.
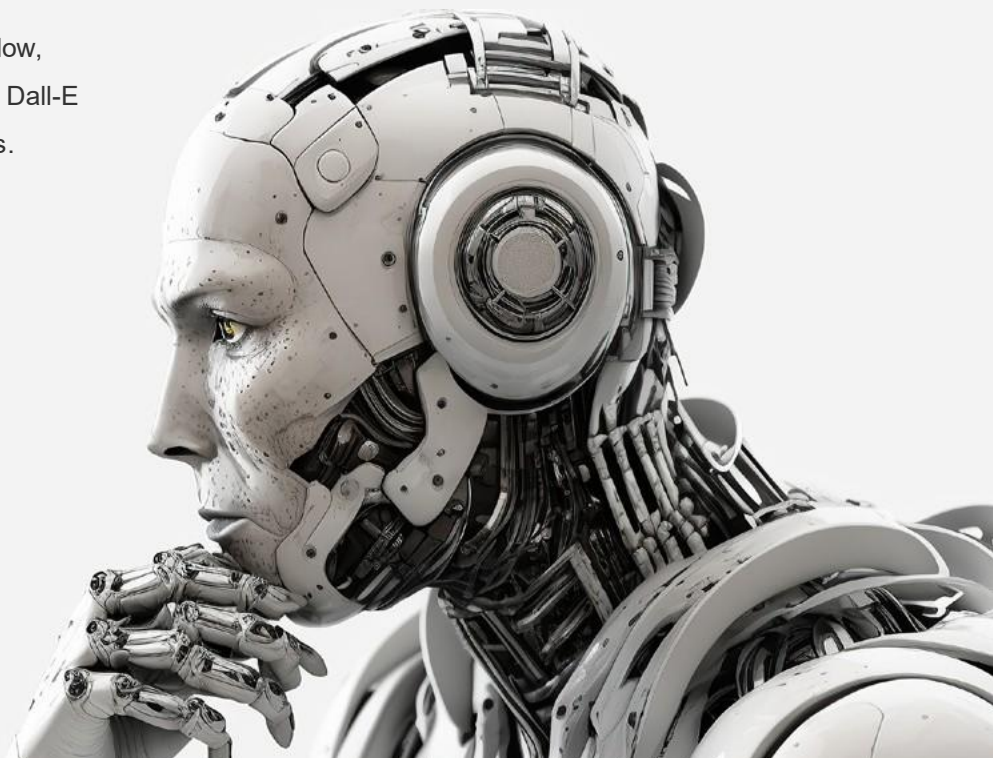
About IBM and Simplilearn Collaboration

IBM is a leading cognitive solution and cloud platform company, offering a plethora of technology and consulting services. Each year, IBM invests approximately $6 billion in research and development and has achieved five Nobel Laureates, nine US National Medals of Technology and Innovation, five US National Medals of Science, six Turing Awards, and 10 inductees in the US Inventors Hall of Fame.

A partnership between IBM and Simplilearn introduces students to the best-in-class applied learning experience, making them experts in the field of AI. This program, in collaboration with IBM, delivers a top-notch, industry-relevant curriculum and prepares students for any job role in the Artificial Intelligence and Machine Learning domain.

About Simplilearn

Simplilearn is the world's #1 online bootcamp provider, enabling learners around the globe with rigorous and highly specialized training offered in partnership with world-renowned universities and leading corporations. We focus on emerging technologies and skills transforming the global economy, such as artificial intelligence, data science, cloud computing, programming, and more. Our hands-on and immersive training includes live virtual classes, integrated labs and projects, 24x7 support, and a collaborative learning environment. Over two million professionals and 2000 corporate training organizations across 150 countries have harnessed our award-winning programs to achieve their career and business goals.

Eligibility Criteria

For admission to this AI Engineer Master's program, candidates should have:

- A bachelor's degree with an average of 50% or higher marks
- Prior knowledge or experience in programming and mathematics
- Preferably 2+ years of formal work experience

Who should Enroll to this Program

This program caters to professionals from a variety of industries and backgrounds. The diversity of our students adds richness to class discussions and interactions. Roles in this space require a combination of experience and an understanding of tools and technologies. This program is ideal for professionals looking for a career transition into the field of AI and ML, who have knowledge or prior experience in programming and mathematics, and an analytical frame of mind.

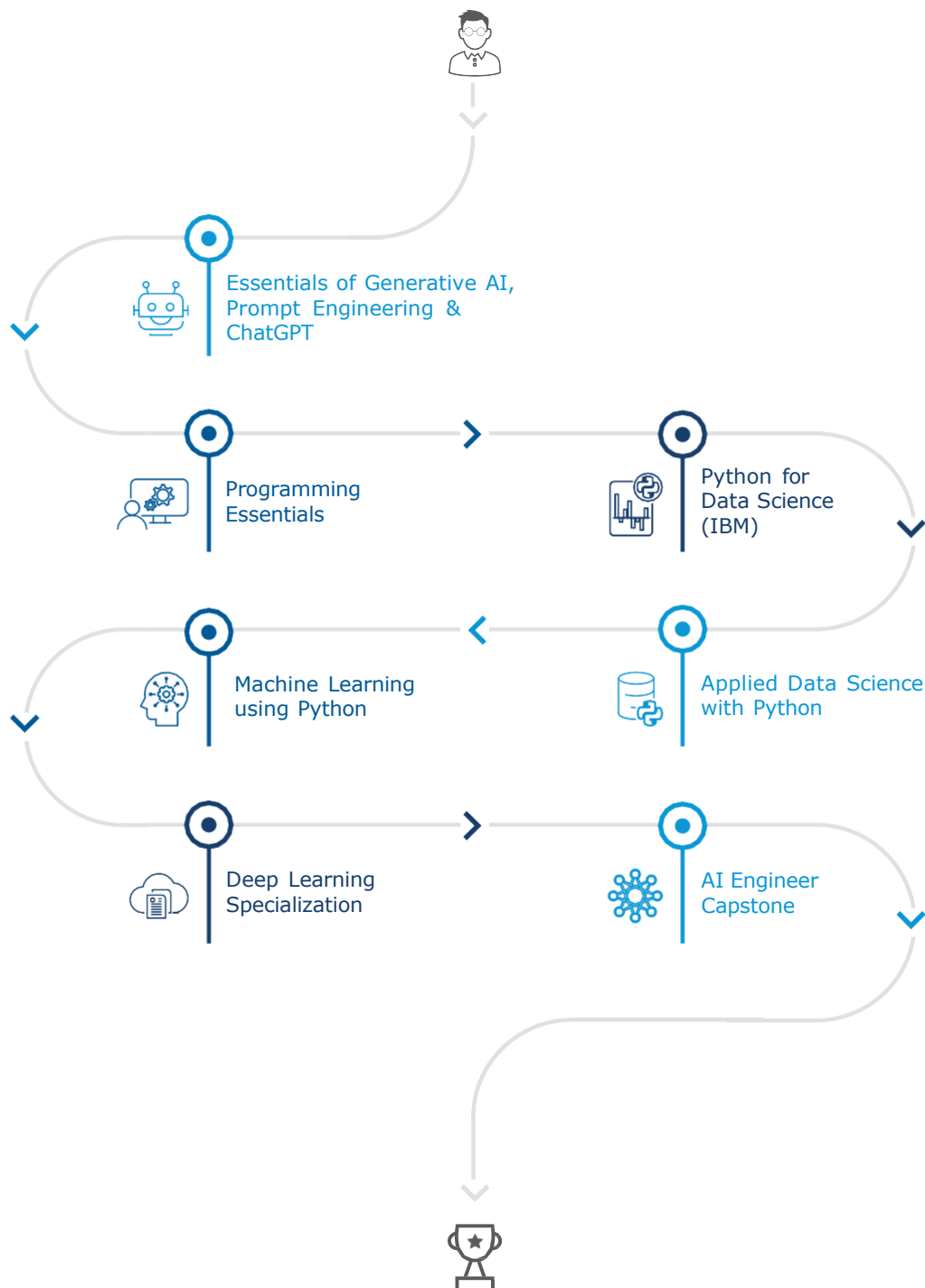**Professionals eager to develop AI and ML expertise with the objective of:**

- Enhancing effectiveness in their current role
- Transitioning to AI and ML roles in their organization
- Seeking to advance their career in the industry
- Giving shape to entrepreneurial aspirations

Program Outcomes

- Gain insights into the latest AI trends like Generative AI, prompt engineering, ChatGPT, and more.

- Learn how to apply effective prompt engineering techniques to improve the performance and control the behavior of Generative AI models.

- Master AI and ML comprehensively, understanding their meaning, purpose, scope, stages, applications, and effects.

- Navigate data science intricacies with expertise, encompassing processes, wrangling, exploration, visualization, hypothesis building, and testing.

- Conduct scientific and technical computing seamlessly using the SciPy package, including subpackages like Integrate, Optimize, Statistics, IO, and Weave.

- Excel in mathematical computing using the NumPy and scikit-learn package.

- Gain expertise in supervised and unsupervised learning, recommendation engines, and time series modeling.

- Validate machine learning models effectively, decoding various accuracy metrics.

- Understand and apply deep learning across various applications.

- Navigate the layers of data abstraction in neural networks, gaining unparalleled insights into data.

- Utilize tools like Keras to build computer vision applications.

- Become well-versed with Generative Adversarial Networks (GANs).

- Execute distributed and parallel computing efficiently, leveraging high-performance GPUs.

- Comprehend natural language understanding and natural language generation.

- Master natural language understanding and generation, delving into the fundamentals of NLP using Python's Natural Language Toolkit (NLTK).

- Know how to apply machine learning and deep learning seamlessly with NLP.

- Conduct text-to-speech conversion with automated speech recognition.

- Learn how to apply reinforcement learning theory using Python and TensorFlow.

- Master ways to solve reinforcement learning problems through various industry-standard strategies.

Learning Path

Essentials of Generative AI, Prompt Engineering & ChatGPT

Programming Essentials

Python for Data Science (IBM)

Machine Learning using Python

Applied Data Science with Python

Deep Learning Specialization

AI Engineer Capstone

Electives

- Deep Learning with TensorFlow (IBM)
- Advanced Deep Learning and Computer Vision
- Natural Language Processing
- Reinforcement Learning
- Advanced Generative AI
- AI Engineer Industry Masterclass

# Essentials of Generative AI, Prompt Engineering & ChatGPT

This course thoroughly explores Generative AI models, specifically emphasizing ChatGPT. Participants will understand the fundamentals of Generative AI and its scope, prompt engineering, explainable AI, conversational AI, ChatGPT, other large language models, and more.

Learning Outcomes:

- Acquire a solid foundation in Generative AI models, encompassing their core principles and various models.

- Grasp the concept of explainable AI, understand its importance, and distinguish between different approaches for achieving explainability in AI systems.

- Utilize effective prompt engineering techniques to enhance performance and regulate the behavior of Generative AI models.

- Develop a comprehensive understanding of ChatGPT, including its operational mechanisms, notable features, and limitations.

- Explore a range of applications and scenarios where ChatGPT can be effectively utilized.

- Master fine-tuning techniques to personalize and optimize ChatGPT models.

- Recognize the ethical challenges of Generative AI models to ensure responsible data usage, mitigate bias, and prevent misuse.

- Comprehend the transformative potential of Generative AI across industries and explore prominent tools.

- Gain insights into the future of Generative AI, its challenges, and the necessary steps to unlock its full potential.

Topics covered:

- Generative AI and its Landscape

- Explainable AI

- Conversational AI

- Prompt Engineering

- Designing and Generating Effective Prompts

- Large Language Models

- ChatGPT and its Applications

- Fine-tuning ChatGPT

- Ethical Considerations in Generative AI Models

- Responsible Data Usage and Privacy

- The Future of Generative AI

- AI Technologies for Innovation
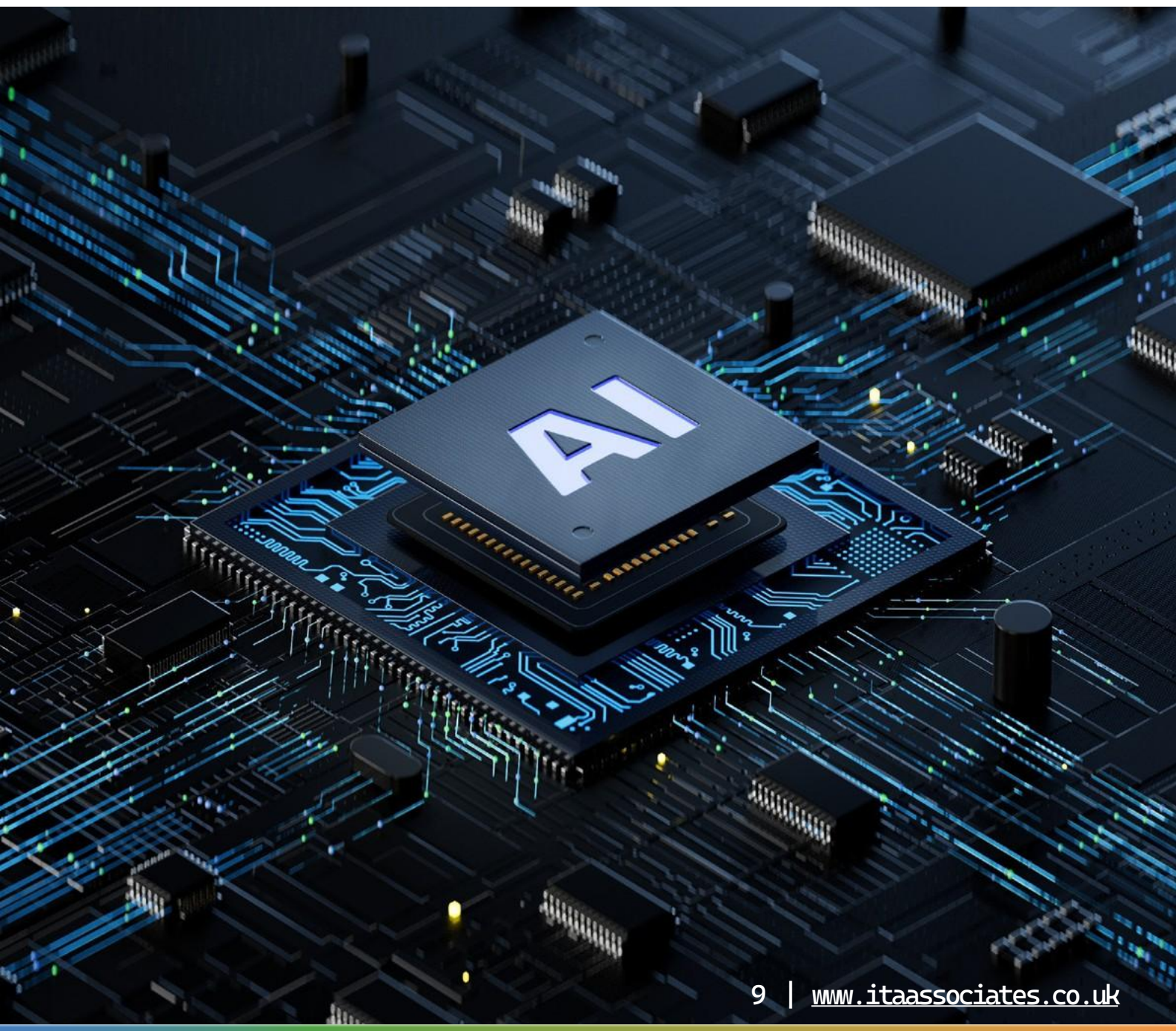
Programming Essentials

In this course, you will acquire essential Python skills that will serve as one of the building blocks for your journey throughout the program.

Learning Outcomes:

- Gain knowledge of procedural and object-oriented programming.

- Understand the benefits and advantages of using Python as a programming language.

- Install Python and its integrated development environment.

- Familiarize yourself with Jupyter Notebook and its usage.

- Implement Python identifiers, indentations, and comments effectively.

- Understand Python's data types, operators, and string functions.

- Learn about different types of loops in Python.

- Explore variable scope within functions.

- Explain the concepts of object-oriented programming and its characteristics.

- Describe methods, attributes, and access modifiers in Python.

- Gain an understanding of multi-threading.

Topics covered:

- Fundamentals of Programming

- Introduction to Python Programming

- Python Data Types and Operators

- Conditional Statements and Loops in Python

- Python Functions

- Object-Oriented Programming Concepts with Python

- Threading

Python for Data Science (IBM)

Designed by IBM, this course teaches students how to leverage Python for data science. Upon completion, you will be able to write Python scripts and conduct critical hands-on data analysis using a Jupyter-based lab environment.

Learning Outcomes:

- Use variables, strings, functions, loops, and conditions to create your first Python program.

- Gain an understanding of lists, sets, dictionaries, conditions, branching, objects, and classes.

- Leverage pandas to load, manipulate, and save data, as well as read and write files in Python.

Topics covered:

- Python Basics

- Python Data Structures

- Python Programming Fundamentals

- Working with Data in Python

- Working with NumPy Arrays

Applied Data Science with Python

This course provides a comprehensive understanding of data science essentials, including data preparation, model building, and evaluation. Participants will learn concepts like strings, Lambda functions, and lists. Additionally, they will explore topics like NumPy, linear algebra, and statistical concepts, including measures of central tendency and dispersion, skewness, covariance, and correlation. The course also covers hypothesis testing, such as Z-test, T-test, and ANOVA, and data manipulation using pandas. Participants will develop data visualization skills using popular libraries like Matplotlib, Seaborn, Plotly, and Bokeh.

Learning Outcomes:

- Explain the fundamentals of data science and its practical applications.

- Explore the processes of data preparation, model building, and evaluation.

- Apply Python concepts like strings and comprehensively understand Lambda functions and lists.

- Develop a solid understanding of the fundamentals of NumPy.

- Explore array indexing and slicing techniques.

- Apply principles of linear algebra in data analysis.

- Understand the application of calculus in linear algebra.

- Calculate measures of central tendency and dispersion.

- Gain a clear understanding of statistical concepts such as skewness, covariance, and correlation.

- Describe the null hypothesis and alternative hypothesis.

- Examine different hypothesis tests, including Z-test and T-test.

- Understand the concept of ANOVA.

- Work with pandas' two primary data structures: Series and DataFrame.

- Utilize pandas for tasks such as data loading, indexing, reindexing, and data merging.

- Prepare, format, normalize, and standardize data using data binning techniques.

- Create visualizations with Matplotlib, Seaborn, Plotly, and Bokeh.

Topics covered:

- Introduction to Data Science
- Essentials of Python Programming
- NumPy
- Linear Algebra
- Statistics Fundamentals
- Probability Distributions

- Advanced Statistics
- Working with pandas
- Data Analysis
- Data Wrangling
- Data Visualization
- End-to-End Statistics Applications in Python

Machine Learning using Python

This course provides a comprehensive overview of various machine learning types and their practical applications. You will explore the machine learning pipeline and gain insights into supervised learning, regression models, and classification algorithms. Additionally, you will study unsupervised learning, clustering techniques, and ensemble modeling. Evaluate popular machine learning frameworks such as TensorFlow and Keras, and build a recommendation engine using PyTorch.

Learning Outcomes:

- Examine the different types of machine learning and their respective characteristics.

- Analyze the machine learning pipeline and understand the key operations involved in Machine Learning Operations (MLOps).

- Learn about supervised learning and its wide range of applications.

- Understand the concepts of overfitting and underfitting and employ techniques to detect and prevent them.

- Analyze various regression models and their suitability for different scenarios.

- Identify linearity between variables and create correlation maps.

- List different types of classification algorithms and understand their specific applications.

- Master various types of unsupervised learning methods and when to use them.

- Gain a deep understanding of different clustering techniques within unsupervised learning.

- Examine different ensemble modeling techniques such as bagging, boosting, and stacking.

- Evaluate and compare different machine learning frameworks, including TensorFlow and Keras.

- Build a recommendation engine using PyTorch.

Topics covered:

- ✔ Machine Learning
- ✔ Supervised Learning
- ✔ Regression and its Applications
- ✔ Classification and its Applications

- ✔ Unsupervised Learning
- ✔ Ensemble Learning
- ✔ Recommendation Systems

Deep Learning Specialization

This comprehensive course provides the knowledge and skills to deploy deep learning tools using AI/ML frameworks effectively. You will explore the fundamental concepts and practical applications of deep learning while gaining a clear understanding of the distinctions between deep learning and machine learning. The course covers a wide range of topics, including neural networks, forward and backward propagation, TensorFlow 2, Keras, performance optimization techniques, model interpretability, Convolutional Neural Networks (CNNs), transfer learning, object detection, Recurrent Neural Networks (RNNs), autoencoders, and creating neural networks in PyTorch. By the end of the course, you will have a solid foundation in deep learning principles and the ability to build and optimize deep learning models effectively using Keras and TensorFlow.

Learning Outcomes:

- Differentiate between deep learning and machine learning and understand their respective applications.

- Gain a thorough understanding of various types of neural networks.

- Master the concepts of forward propagation and backward propagation in Deep Neural Networks (DNNs).

- Gain insight into modeling techniques and performance improvement in deep learning.

- Understand the principles of hyperparameter tuning and model interpretability.

- Learn about essential techniques such as dropout and early stopping and implement them effectively.

- Develop expertise in Convolutional Neural Networks (CNNs) and object detection.

- Acquire a solid understanding of Recurrent Neural Networks (RNNs).

- Gain familiarity with PyTorch and learn how to create neural networks using this framework.

Topics covered:

- Introduction to Deep Learning

- Artificial Neural Networks

- Deep Neural Networks

- TensorFlow

- Model Optimization and Performance Improvement

- Convolutional Neural Networks (CNNs)

- Transfer Learning

- Object Detection

- Recurrent Neural Networks (RNNs)

- Transformer Models for Natural Language Processing (NLP)

- Getting Started with Autoencoders

- PyTorch

AI Engineer Capstone

The capstone project allows you to implement the skills you will learn throughout this masters program. You will solve industry-specific challenges by leveraging various AI and ML techniques. The capstone project will help you showcase your expertise to employers.

Learning Outcomes:

The capstone project will enhance your understanding of the artificial intelligence decision cycle, including performing exploratory data analysis, building and fine-tuning a model with cutting-edge AI-based algorithms, and representing results.
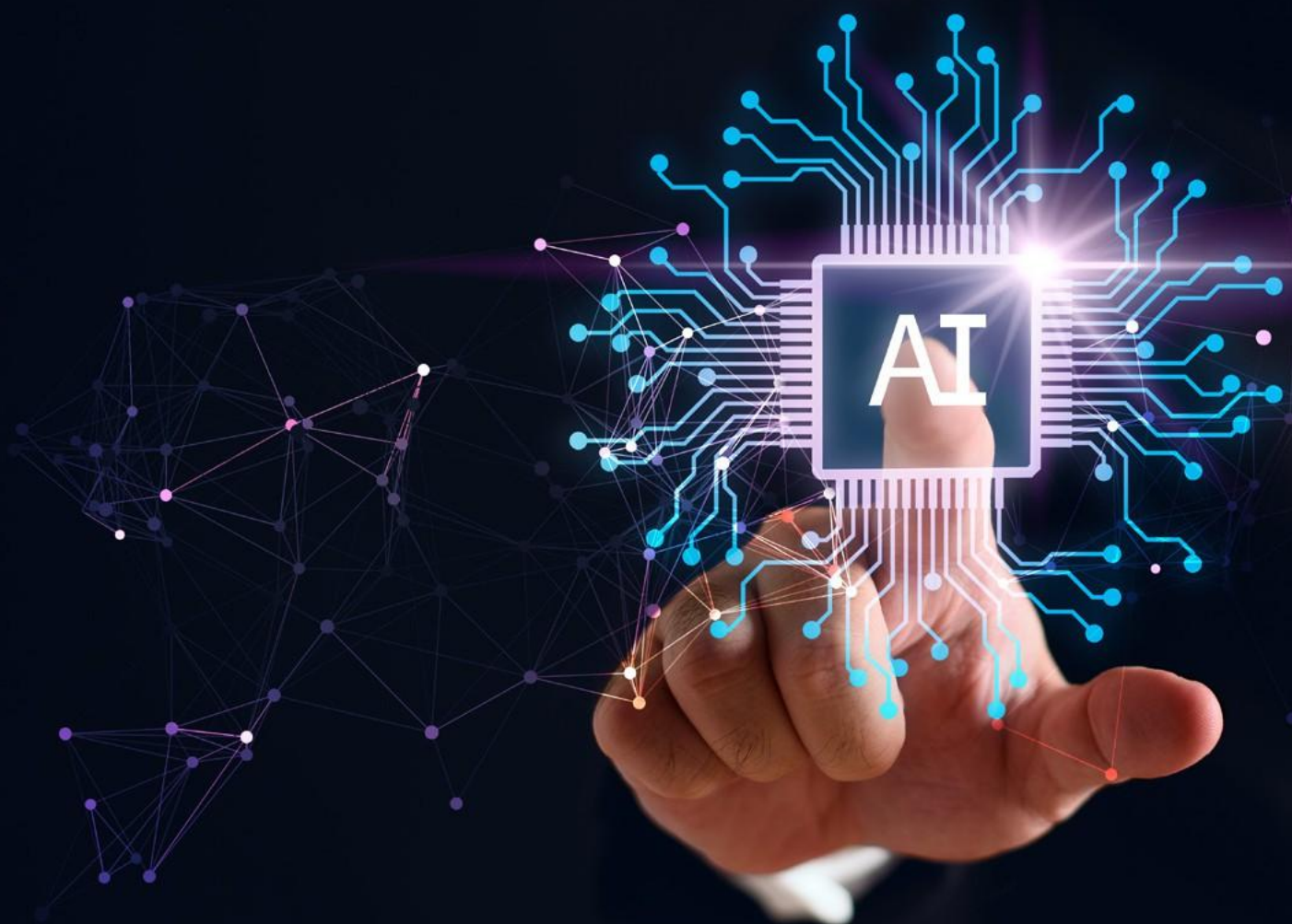
Electives

Deep Learning with Tensorflow (IBM)

This course will take your machine learning skills to the next level by providing a comprehensive understanding of Deep Learning with TensorFlow and Keras. Become proficient in deep learning concepts, enabling you to construct artificial neural networks and navigate through layers of data abstraction. By unlocking the potential of data, this course prepares you for new frontiers in Artificial Intelligence.
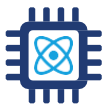
Advanced Deep Learning and Computer Vision

This comprehensive course provides in-depth knowledge and practical skills in the field of computer vision and advanced deep learning techniques. You will delve into various topics, including image formation and processing, Convolutional Neural Networks (CNNs, object detection, image segmentation, generative models, optical character recognition, distributed and parallel computing, and deploying deep learning models. By the end of the course, you will have the expertise to tackle complex computer vision challenges and successfully deploy deep learning models in various applications.

Natural Language Processing

In this course, you will gain a detailed understanding of the science behind applying machine learning algorithms to process vast amounts of natural language data. The course focuses on natural language understanding, feature engineering, natural language generation, automated speech recognition, speech-to-text conversion, text-to-speech conversion, and voice assistance devices.

Reinforcement Learning

This course offers a comprehensive exploration of the core concepts of reinforcement learning. You will learn how to solve reinforcement learning problems using various strategies through practical examples and hands-on exercises using Python and TensorFlow. The course covers the theory behind RL algorithms and equips you with the skills to effectively utilize reinforcement learning as a problem-solving strategy. By the end of the course, you will be proficient in using RL algorithms to tackle a wide range of real-world challenges.

Advanced Generative AI

Dive deep into innovative Generative AI principles with this advanced course. During the program, you'll thoroughly explore neural networks, LLMs, their architectures, and diverse generative models such as VAEs, GANs, autoencoders, and transformer-based models. Delve into renowned Generative AI models like GPT, BERT, and T5, mastering the art of effectively assessing their performance. Participate in hands-on learning activities, acquiring practical expertise in building and deploying a conversational chatbot that engages in meaningful dialogue interactions.

AI Engineer Industry Masterclass

Attend this live interactive industry masterclass to gain insights about the latest advancements in artificial intelligence.

Tools Covered

python™

K Keras

django

DALL·E 2

NLTK

Flask

Bard

TensorFlow

ChatGPT

OpenCV

matplotlib

learn

Midjourney

Projects

E-commerce

Develop a shopping app for an ecommerce company using Python.

Food Service

Using data science techniques, such as time series forecasting, to help a data analytics company forecast demand for different restaurant items.

Retail

Use exploratory data analysis and statistical techniques to understand the factors contributing to a retail firm's customer acquisition.

Production

To understand their overall quality and sustainability, perform a feature analysis of water bottles using EDA and statistical techniques.

Real Estate

Use feature engineering to identify the top factors that influence price negotiations in the homebuying process.

Entertainment

Perform cluster analysis to create a recommended playlist of songs based on user behavior.

Human Resources

Build a machine learning model that predicts employee attrition rate at a company by identifying patterns in their work habits and desires to stay with the company.

Shipping

Use deep learning concepts, such as Convolutional Neural Networks (CNN), to automate a system that detects and prevents faulty situations resulting from human error and identifies the type of ship entering the port.

BFSI

Uses deep learning to construct a model that predicts potential loan defaulters and ensures secure and trustworthy lending opportunities for a financial institution.

Tourism

Use AI to categorize images of historical structures and conduct Exploratory Data Analysis (EDA) to build a recommendation engine that improves marketing initiatives for historic locations.

Automobile

Examine accident data involving Tesla's auto-pilot feature to assess the correlation between road safety and the use of auto-pilot technology.

Healthcare

Use distributed training to construct a CNN model capable of detecting diabetic retinopathy and deploy it using TensorFlow Serving for an accurate diagnosis. Leverage deep learning algorithms to develop a facial recognition feature that helps diagnose patients for genetic disorders and their variations.
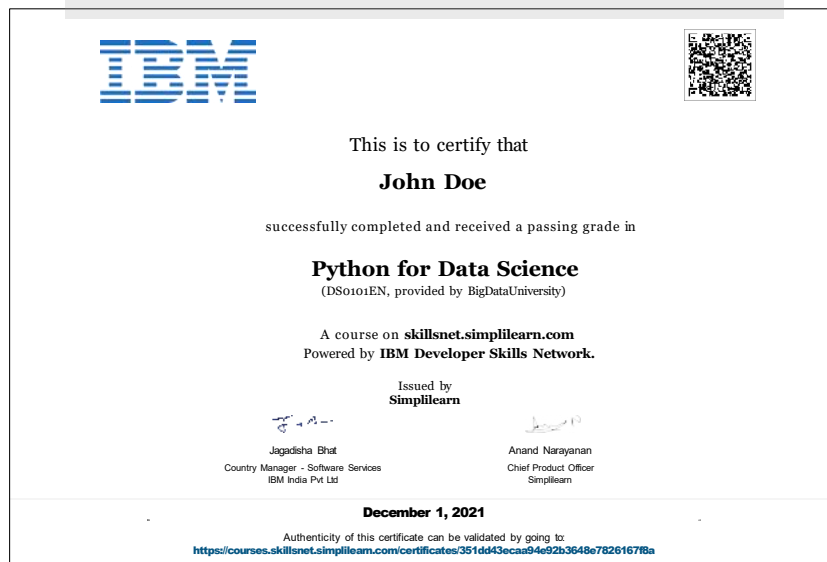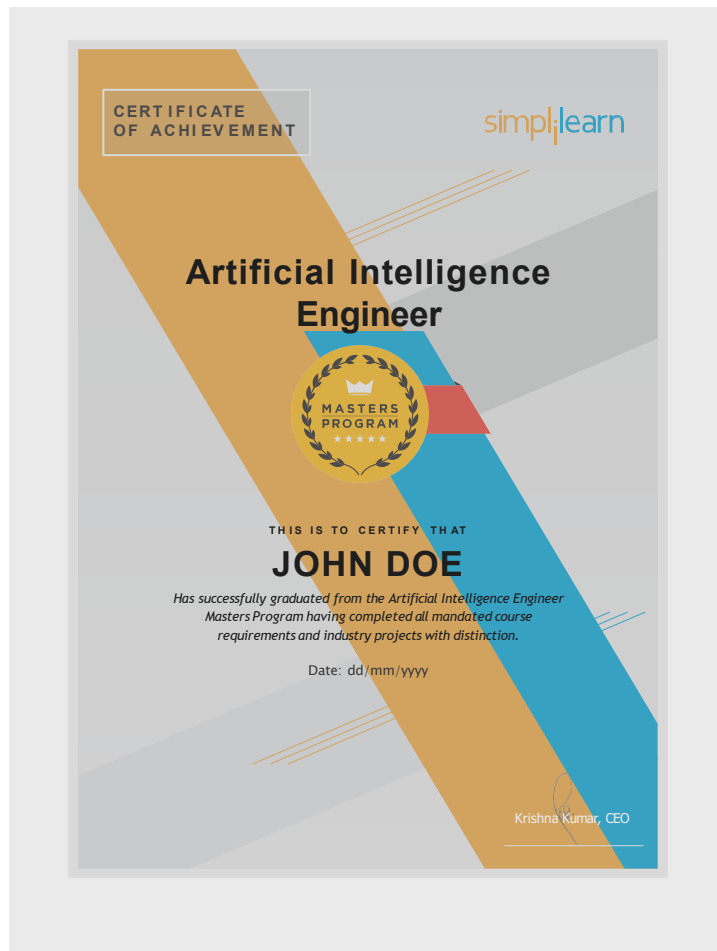
Upon completion of this Master's Program, you will receive the certificates from IBM and Simplilearn for the AI courses in the learning path. These certificates will testify to your skills as an expert in artificial intelligence. Upon program completion, you will also receive an industry-recognized Master's Certificate from Simplilearn.

United Kingdom

UBC 1st Floor
The Mille
1000 Great West Road
TW89DW

Phone: +44 7397 538 969

E-mail: info@itaassociates.co.uk

www.itaassociates.co.uk