



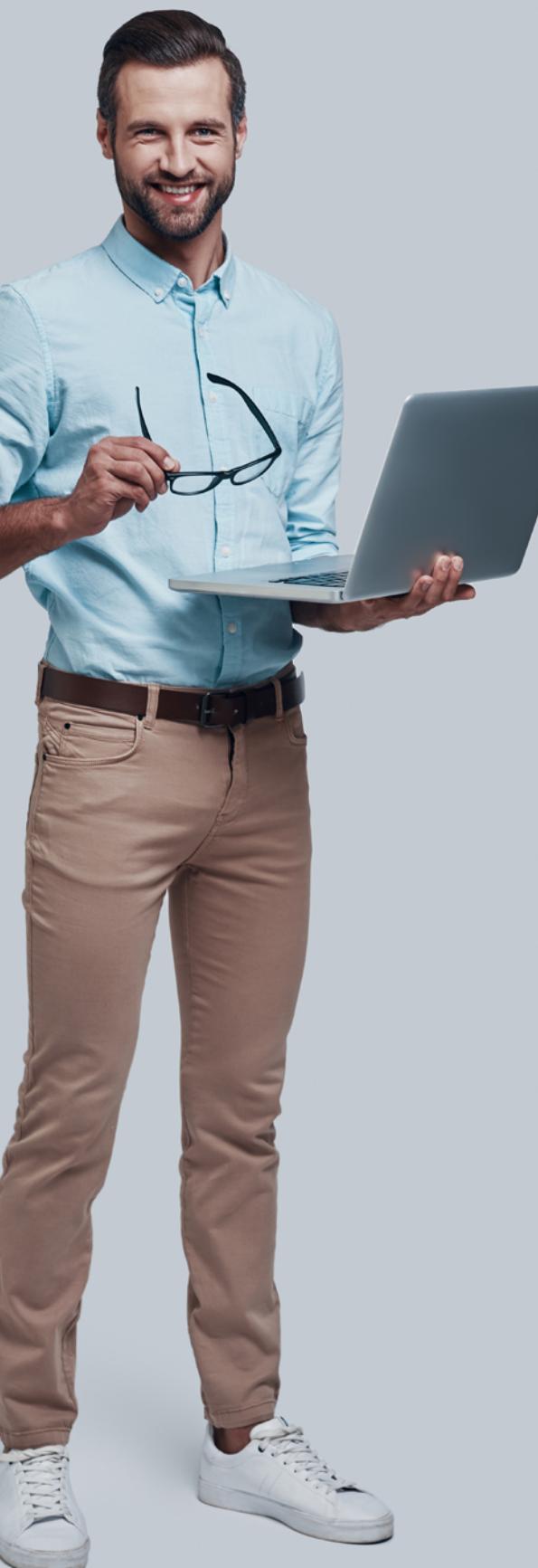
Post Graduate Program in AI and Machine Learning

In collaboration with IBM

simplilearn

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About the Program

Artificial intelligence (AI) and machine learning are among the most sought after and highly compensated digital economy skills. Accelerate your career with our acclaimed Post Graduate Program in AI and Machine Learning in partnership with Purdue University and in collaboration with IBM. This program features the perfect mix of theory, case studies, and extensive hands-on practice in artificial intelligence education, leveraging Purdue's academic excellence and Simplilearn's partnership with IBM.

This post graduate program is a blend of self-paced online videos, live virtual classes, hands-on projects, and GPU-enabled labs. Mentorship sessions will provide you with a high-engagement learning experience and real-world applications, helping you master essential AI and machine learning skills. You will receive in-depth exposure to AI concepts and workflows, Python, machine learning, deep learning concepts using TensorFlow and Keras, computer vision, GANs, parallel and distributed computing using GPUs, and more. You will learn how to deploy deep learning models in various environments, such as Kubernetes and Docker, the basics of natural language processing (NLP), speech recognition, and deep reinforcement learning, which will prepare you for an exciting career in AI and machine learning.

Key Features of the Post Graduate Program in AI and Machine Learning in Partnership with Purdue University



Purdue Post
Graduate Program
Certification



Purdue Alumni
Association
membership



Industry-recognized
IBM certificates



25+ hands-
on projects on
integrated labs



450+ hours
of Blended
Learning



Capstone
project in
3 Domains



Masterclasses
from Purdue

About the Post Graduate Program in AI and Machine Learning in partnership with Purdue University

This Post Graduate Program in AI and Machine Learning is in partnership with Purdue University, one of the world's leading research and teaching institutions with over 150 years of academic excellence, offering higher education at its highest proven value. Committed to student success, Purdue is changing the student experience with a greater focus on faculty-student interaction and creative use of technology.

This program is designed to prepare you to kickstart your career in Artificial Intelligence, Machine Learning, and Deep Learning.

Upon successfully completing this program, you will:

- › Receive a joint Purdue-Simplilearn certificate of completion
- › Become entitled for membership in the Purdue University Alumni Association



About Simplilearn

Simplilearn is a leader in digital skills training, focused on the emerging technologies that are transforming our world. Our unique blended learning approach drives learner engagement and is backed by the industry's highest course completion rates. Partnering with professionals and companies, we identify their unique needs and provide outcome-centric solutions to help them achieve their professional goals.

Program Eligibility Criteria and Application Process

Those wishing to enroll in the Post Graduate Program in AI and Machine Learning in partnership with Purdue University will be required to apply for admission.

Eligibility Criteria

For admission to the Post Graduate Program in AI and Machine Learning, candidates should have:

- ✓ A bachelor's degree with an average of 50% or higher marks
- ✓ Basic understanding of programming concepts and mathematics
- ✓ Working Professionals with 2+ years of experience are preferred to apply for this program

Application Process

The application process consists of three simple steps. An offer of admission will be made to the selected candidates and accepted by the candidates upon payment of the admission fee.

STEP 1

SUBMIT AN APPLICATION

Complete the application and include a brief statement of purpose to tell our admissions counselors why you're interested and qualified for the Post Graduate Program in AI and Machine Learning.

STEP 2

APPLICATION REVIEW

After you submit your application, a panel of admissions counselors will review your application and statement of purpose to determine your qualifications and interest in the program.

STEP 3

ADMISSION

An offer of admission will be made to qualified candidates. You can accept this offer by paying the program fee.



Talk to an Admissions Counselor

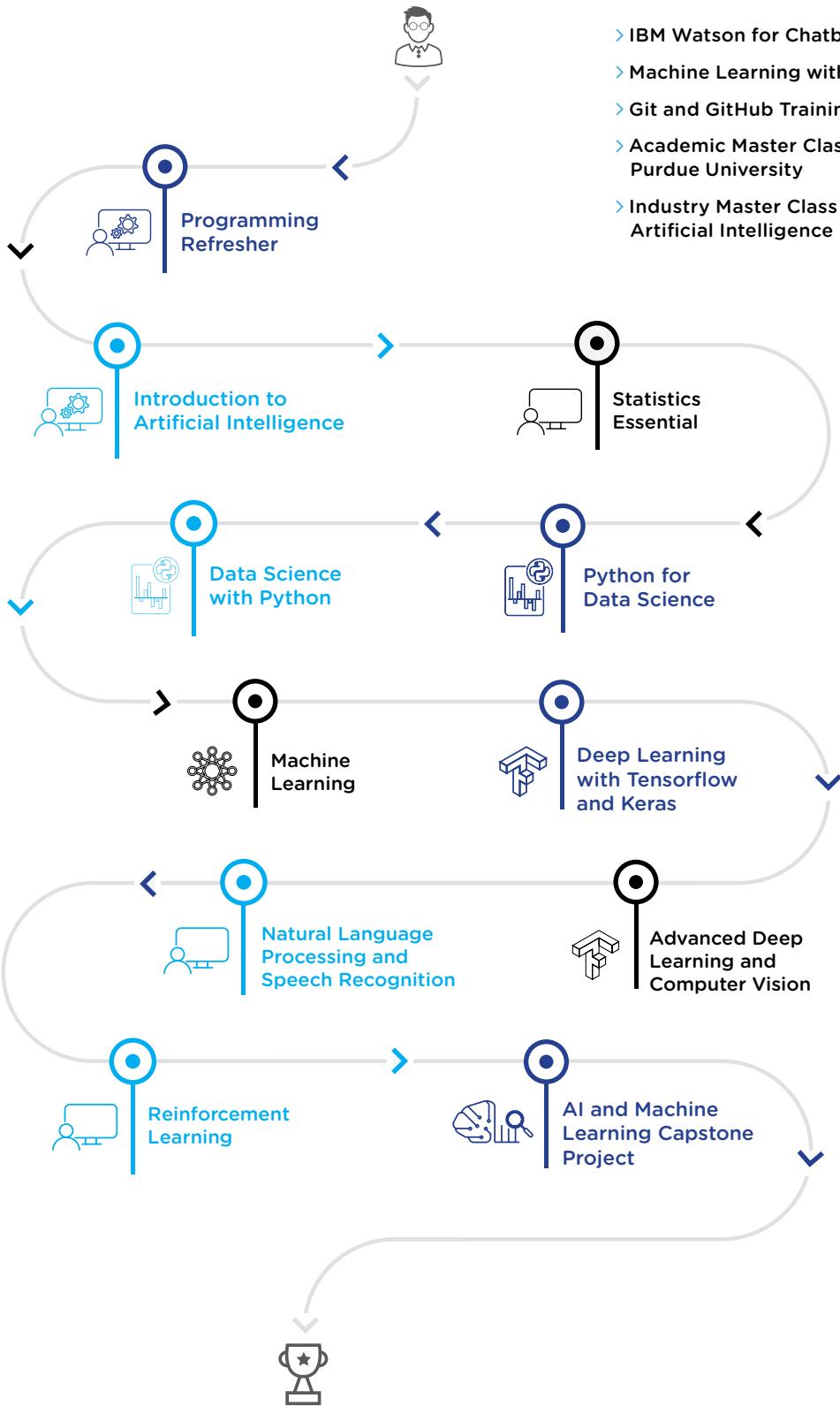
We have a team of dedicated admissions counselors who are here to help guide you in the application process and related matters. They are available to:

- ✓ Address questions related to the application
- ✓ Assist with financial aid (if required)
- ✓ Help you better understand the program and answer your questions

Learning Path

Electives

- > IBM Watson for Chatbots
- > Machine Learning with R
- > Git and GitHub Training
- > Academic Master Class - Purdue University
- > Industry Master Class - Artificial Intelligence



Program Outcomes



Understand the meaning, purpose, scope, stages, applications, and effects of AI



Gain an in-depth understanding of data science processes, data wrangling, data exploration, data visualization, hypothesis building, and testing



Perform scientific and technical computing using the SciPy package and its sub-packages, such as Integrate, Optimize, Statistics, IO, and Weave



Gain expertise in mathematical computing using the NumPy and Scikit-Learn package



Master the concepts of supervised and unsupervised learning, recommendation engine, and time series modeling



Validate machine learning models and decode various accuracy metrics



Master advanced topics, such as Keras and TensorFlow, elements of a Keras model, Keras on GPU, and more



Build deep learning models on the cloud using AWS Sagemaker



Implement deep learning algorithms, understand neural networks, and traverse the layers of data abstraction which will empower you to understand data like never before



Learn deep learning techniques like object detection using computer vision



Explore tools, such as Keras, to build computer vision applications



Understand how to apply machine learning and deep learning with NLP



Become familiar with generative-adversarial networks (GANs)



Understand the basics of speech recognition and do hands-on exercises



Perform distributed and parallel computing using high-performance GPUs



Perform text-to-speech conversion with automated speech recognition



Deploy deep learning models with Flask/Django, Kubernetes, and serverless environments like Docker and SageMaker



Work on voice-assistance devices and build Alexa skills



Learn about natural language understanding and natural language generation



Use Python and TensorFlow to understand reinforcement learning theory



Understand the fundamentals of natural language processing (NLP) using the most popular library, Python's Natural Language Toolkit (NLTK)



Learn how to solve reinforcement learning problems with a variety of strategies



Who Should Enroll in this Program?

This program caters to working professionals from a variety of industries and backgrounds; the diversity of our students adds richness to class discussions and interactions.

The Artificial Intelligence role requires a combination of experience, Data Science knowledge, and an understanding of the correct tools and technologies. AI is a solid career choice for both new and experienced professionals. Aspiring professionals looking for a career transition into AI and Machine Learning, who have basic programming skills and an analytical frame of mind,

are most suited to pursue this Post Graduate Program in AI and Machine Learning, including:

- ✓ IT professionals
- ✓ Software developers
- ✓ Data analysts
- ✓ Analytics managers
- ✓ Business analysts
- ✓ Data engineers
- ✓ Data scientists
- ✓ Beginners or recent graduates with a bachelor's or master's degree

Programming Refresher

Programming is an increasingly important skill; this course will establish your proficiency in handling basic programming concepts. By the end of this program, you will understand object-oriented programming; basic programming concepts such as data types, variables, strings, loops, and functions; and software engineering concepts such as multithreading and multitasking using Python.

Key Learning Objectives

- ✓ Obtain fundamental knowledge of programming basics
- ✓ Achieve an understanding of object-oriented programming principles including data types, variables, strings, loops, and functions
- ✓ Comprehend software engineering concepts, such as multithreading and multitasking using Python

Course curriculum

- ✓ Lesson 1 - Course Introduction
- ✓ Lesson 2- Programming Basics

Introduction to Artificial Intelligence

The Introduction to Artificial Intelligence course is designed to help learners decode the mystery of AI and its business applications. The course provides an overview of AI concepts and workflows, machine learning and deep learning, and performance metrics. You'll learn the difference between supervised, unsupervised, and reinforcement learning; be exposed to use cases; and see how clustering and classification algorithms help identify AI business applications.

Key Learning Objectives

- ✓ Understand the meaning, purpose, scope, stages, applications, and effects of AI
- ✓ Understand the fundamental concepts of Machine Learning and Deep Learning
- ✓ Distinguish between supervised, semi-supervised, and unsupervised learning
- ✓ Learn about Machine Learning workflow and how to implement the steps effectively
- ✓ Understand the role of performance metrics and how to identify their key methods

Course curriculum

- ✓ Lesson 1 - Decoding Artificial Intelligence
- ✓ Lesson 2 - Fundamentals of Machine Learning and Deep Learning
- ✓ Lesson 3 - Machine Learning Workflow
- ✓ Lesson 4 - Performance Metrics

Statistics Essential

Statistics—a foundation of Artificial Intelligence—is the science of assigning a probability through the collection, classification, and analysis of data. This course will enable you to define statistics and essential terms related to it, explain measures of central tendency and dispersion, and comprehend skewness, correlation, regression, and distribution. You will be able to make data-driven predictions through statistical inference.

Key Learning Objectives

- ✓ Understand the fundamentals of statistics
- ✓ Work with different types of data
- ✓ Learn how to plot different types of data
- ✓ Calculate the measures of central tendency, asymmetry, and variability
- ✓ Calculate correlation and covariance
- ✓ Distinguish and work with different types of distribution
- ✓ Estimate confidence intervals
- ✓ Perform hypothesis testing
- ✓ Make data-driven decisions
- ✓ Understand the mechanics of regression analysis
- ✓ Carry out regression analysis
- ✓ Use and understand dummy variables
- ✓ Understand the concepts needed for Data Science, even with Python and R

Course curriculum

- ✓ Lesson 1 - Introduction
- ✓ Lesson 2 - Sample or Population Data?
- ✓ Lesson 3 - The Fundamentals of Descriptive Statistics
- ✓ Lesson 4 - Measures of Central Tendency, Asymmetry, and Variability
- ✓ Lesson 5 - Practical Example: Descriptive Statistics
- ✓ Lesson 6 - Distributions
- ✓ Lesson 7 - Estimators and Estimates
- ✓ Lesson 8 - Confidence Intervals: Advanced Topics
- ✓ Lesson 9 - Practical Example: Inferential Statistics
- ✓ Lesson 10 - Hypothesis Testing: Introduction
- ✓ Lesson 11 - Hypothesis Testing: Let's Start Testing!
- ✓ Lesson 12 - Practical Example: Hypothesis Testing
- ✓ Lesson 13 - The Fundamentals of Regression Analysis
- ✓ Lesson 14 - Subtleties of Regression Analysis
- ✓ Lesson 15 - Assumptions for Linear Regression Analysis
- ✓ Lesson 16 - Dealing with Categorical Data
- ✓ Lesson 17 - Practical Example: Regression Analysis

Python for Data Science

Kickstart your learning of Python for Data Science with this introductory course, carefully crafted by IBM. Upon completion of this course, you will be able to write your Python scripts and perform fundamental, hands-on data analysis using the Jupyter-based lab environment.

Key Learning Objectives

- ✓ Write your first Python program by implementing concepts of variables, strings, functions, loops, and conditions
- ✓ Understand the nuances of lists, sets, dictionaries, conditions, branching, objects, and classes
- ✓ Work with data in Python, such as loading, working, and saving data with Pandas, and reading and writing files

Course curriculum

- ✓ Lesson 1 - Python Basics
- ✓ Lesson 2 - Python Data Structures
- ✓ Lesson 3 - Python Programming Fundamentals
- ✓ Lesson 4 - Working with Data in Python
- ✓ Lesson 5 - Working with NumPy Arrays

Data Science with Python

This Data Science with Python course will establish your mastery of Data Science and analytics techniques using Python. In this course, you'll learn the essential Python libraries required for Data Science and gain in-depth knowledge in data analytics, Machine Learning, data visualization, web scraping, and natural language processing. Python is a required skill for many Data Science positions, so jump-start your career with this interactive, hands-on course.

Key Learning Objectives

- ✓ Gain an in-depth understanding of Data Science processes, data wrangling, data exploration, data visualization, hypothesis building, and testing, as well as the basics of statistics
- ✓ Install the required Python environment and other auxiliary tools and libraries
- ✓ Understand the essential concepts of Python programming, such as data types, tuples, lists, dicts, basic operators and functions
- ✓ Perform high-level mathematical computing using the NumPy package and its vast library of mathematical functions
- ✓ Perform scientific and technical computing using the SciPy package and its sub-packages, such as Integrate, Optimize, Statistics, IO, and Weave
- ✓ Perform data analysis and manipulation using data structures and tools provided in the Pandas package
- ✓ Gain expertise in Machine Learning using the Scikit-Learn package
- ✓ Gain an in-depth understanding of supervised learning and unsupervised learning models, such as linear regression, logistic regression, clustering, dimensionality reduction, K-NN, and Pipeline

- ✓ Use the Scikit-Learn package for natural language processing
- ✓ Use the matplotlib library of Python for data visualization
- ✓ Extract useful data from websites by performing web scraping with Python
- ✓ Integrate Python with Hadoop, Spark, and MapReduce

Course curriculum

- ✓ Lesson 1 - Data Science Overview
- ✓ Lesson 2 - Data Analytics Overview
- ✓ Lesson 3 - Statistical Analysis and Business Applications
- ✓ Lesson 4 - Python Environment Setup and Essentials
- ✓ Lesson 5 - Mathematical Computing with Python (NumPy)
- ✓ Lesson 6 - Scientific Computing with Python (SciPy)
- ✓ Lesson 7 - Data Manipulation with Pandas
- ✓ Lesson 8 - Machine Learning with Scikit-Learn
- ✓ Lesson 9 - Natural Language Processing with Scikit Learn
- ✓ Lesson 10 - Data Visualization in Python using Matplotlib
- ✓ Lesson 11 - Web Scraping with BeautifulSoup
- ✓ Lesson 12 - Python Integration with Hadoop MapReduce and Spark

Machine Learning

Simplilearn's Machine Learning course will make you an expert in Machine Learning, a part of AI that automates data analysis to enable computers to learn and adapt through experience to do specific tasks without explicit programming. You will master Machine Learning concepts and techniques, including supervised and unsupervised learning, mathematical and heuristic aspects, and hands-on modeling to develop algorithms and prepare you for your role with advanced Machine Learning knowledge.

Key Learning Objectives

- ✓ Master the concepts of supervised and unsupervised learning, recommendation engine, and time series modeling
- ✓ Gain practical mastery over principles, algorithms, and applications of Machine Learning through a hands-on approach that includes working on four major end-to-end projects and 25+ hands-on exercises
- ✓ Acquire thorough knowledge of the statistical and heuristic aspects of Machine Learning
- ✓ Implement support vector machines, kernel SVM, Naive Bayes, decision tree classifier, random forest classifier, logistic regression, K-means clustering, and more in Python
- ✓ Validate Machine Learning models and decode various accuracy metrics; improve the final models using another set of optimization algorithms, which include boosting and bagging techniques
- ✓ Comprehend the theoretical concepts and how they relate to the practical aspects of Machine Learning

Course curriculum

- ✓ Lesson 1 - Introduction to Artificial Intelligence and Machine Learning
- ✓ Lesson 2: Data Preprocessing
- ✓ Lesson 3: Supervised Learning
- ✓ Lesson 4: Feature Engineering
- ✓ Lesson 5: Supervised Learning-Classification
- ✓ Lesson 6: Unsupervised Learning
- ✓ Lesson 7: Time Series Modelling
- ✓ Lesson 8: Ensemble Learning
- ✓ Lesson 9: Recommender Systems
- ✓ Lesson 10: Text Mining

Deep Learning with TensorFlow and Keras

This course will take you from machine learning to the next level, providing you with a solid understanding of deep learning using TensorFlow and Keras. Master the concepts of deep learning to build artificial neural networks and traverse layers of data abstraction. This course will help you learn how to unlock the power of data and prepare you for new horizons in artificial intelligence.

Key Learning Objectives

- ✓ Understand deep learning leveraging neural networks
- ✓ Gain a fair understanding of Tensorflow and Keras
- ✓ Comprehend convolutional neural networks (CNNs) and their applications
- ✓ Gain familiarity with recurrent neural networks (RNNs) and autoencoders
- ✓ Optimize the performance of your neural network using L2 regularization and dropout layers
- ✓ Create autoencoder models to detect anomalies

Course curriculum

- ✓ Lesson 1 - AI and Deep Learning Introduction
- ✓ Lesson 2 - Artificial Neural Network
- ✓ Lesson 3 - Deep Neural Network and Tools
- ✓ Lesson 4 - Deep Neural Net Optimization, Tuning, and Interpretability
- ✓ Lesson 5 - Convolutional Neural Net (CNN)
- ✓ Lesson 6 - Recurrent Neural Networks
- ✓ Lesson 7 - Autoencoders

Advanced Deep Learning and Computer Vision

Take the next big step toward advancing your deep learning skills with this high-level course. This Advanced Deep Learning and Computer Vision course covers real applications of computer vision, generative-adversarial networks (GANs), distributed and parallel computing with GPUs, and deployment of deep learning models on cloud.

Key Learning Objectives

- ✓ Learn how to filter with restricted Boltzmann machines (RBMs)
- ✓ Work on image translation with GAN
- ✓ Encode, decode, and denoise images with autoencoders
- ✓ Understand the structure and function of neural networks and CNNs/pooling
- ✓ Detect objects in images with You Only Look Once (YOLOv3)
- ✓ Learn to deploy deep learning models on Docker, Kubernetes, and in serverless environments (cloud)

Course curriculum

- ✓ Lesson 1 - Course Introduction
- ✓ Lesson 2 - Prerequisites for the course
- ✓ Lesson 3 - RBM and DBNs
- ✓ Lesson 4 - Variational AutoEncoder
- ✓ Lesson 5 - Working with Deep Generative Models
- ✓ Lesson 6 - Applications: Neural Style Transfer and Object Detection
- ✓ Lesson 7 - Distributed & Parallel Computing for Deep Learning Models
- ✓ Lesson 8 - Reinforcement Learning
- ✓ Lesson 9 - Deploying Deep Learning Models and Beyond

Natural Language Processing and Speech Recognition

This Natural Language Processing and Speech Recognition course will give you a detailed look at the science of applying machine learning algorithms to process large amounts of natural language data. This module primarily 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 (including building Alexa skills).

Key Learning Objectives

- ✓ Understand the concepts, tools, and techniques of NLP
- ✓ Learn about natural language understanding and natural language generation
- ✓ Perform text mining
- ✓ Extract intent and entities
- ✓ Understand the vector space model
- ✓ Apply vector, matrix, and algebra on data
- ✓ Learn about feature engineering
- ✓ Understand the syntactic and semantic structure of a sentence
- ✓ Hands-on experience with Python libraries
- ✓ How to apply machine learning and deep learning with NLP
- ✓ Understand speech and its types
- ✓ Perform text-to-speech conversion with automated speech recognition
- ✓ Work on voice assistance devices and build Alexa skills

Course curriculum

- ✓ Lesson 1 - Introduction to Natural Language Processing
- ✓ Lesson 2 - Feature Engineering on Text Data
- ✓ Lesson 3 - Natural Language Understanding Techniques
- ✓ Lesson 4 - Natural Language Generation
- ✓ Lesson 5 - Natural Language Processing Libraries
- ✓ Lesson 6 - Natural Language Processing with Machine Learning and Deep Learning
- ✓ Lesson 7 - Introduction of Speech Recognition
- ✓ Lesson 8- Signal Processing and Speech Recognition Models
- ✓ Lesson 9 - Speech to Text
- ✓ Lesson 10 - Text to Speech
- ✓ Lesson 11 - Voice Assistant Devices

Reinforcement Learning

This course will take you through all of the core concepts in deep reinforcement learning (RL). You will learn how to solve reinforcement learning problems with a variety of strategies, using Python and TensorFlow to understand RL theory. By the end of this course, you will be able to use reinforcement learning as a problem-solving strategy and use different algorithms to solve problems.

Key Learning Objectives

- ✓ Learn how to solve deep reinforcement learning problems with a variety of strategies
- ✓ Use Python and TensorFlow to understand reinforcement learning theory
- ✓ Fast-paced approach to learning about RL concepts, frameworks, and algorithms; implementing models using reinforcement learning
- ✓ Define and execute Reinforcement Learning algorithms, like Q-learning, SARSA, DQN, A3C, TD3, and Soft Actor-Critic

Course curriculum

- ✓ Lesson 1 - Introduction to Reinforcement Learning
- ✓ Lesson 2 - Reinforcement Learning Framework and Elements
- ✓ Lesson 3 - Multi-Arm Bandit
- ✓ Lesson 4 - Markov Decision Process
- ✓ Lesson 5 - Solution Methods
- ✓ Lesson 6 - Q-value and Advantage Based Algorithms

AI and Machine Learning Capstone Project

The AI and Machine Learning Capstone project will allow you to implement the skills you learned in this Post Graduate Program across domains such as e-commerce, finance, and retail. With dedicated mentoring sessions, you'll know how to solve a real industry-aligned problem. You'll learn various Artificial Intelligence-based supervised and unsupervised techniques such as regression, SVM, tree-based algorithms, and NLP. The Capstone Project is the final step in the learning path and will help you showcase your expertise to employers.

Key Learning Objectives

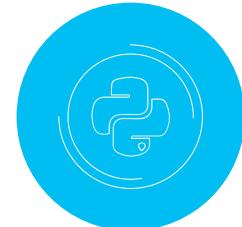
The AI and Machine Learning Capstone Project will bring you through the Artificial Intelligence decision cycle, including exploratory data analysis, building and fine-tuning a model with cutting edge AI-based algorithms, and representing results. The project milestones are as follows:

- ✓ **Exploratory data analysis** - In this step, you will apply various data processing techniques to determine the features and correlation between them, transformations required to make the data sense, new features, construction, etc.
- ✓ **Model building and fitting** - This will be performed using Machine Learning algorithms like regression, multinomial Naïve Bayes, SVM, tree-based algorithms, etc.
- ✓ **Unsupervised learning** - Clustering in order to group similar kind of transactions and reviews using NLP and related techniques to devise meaningful conclusions.
- ✓ **Representing results** - As a last step, you will be required to export your results into a dashboard with useful insights.

Elective Course

IBM Watson for Chatbots

This course provides a practical introduction to building a chatbot with Watson Assistant without writing any code and then deploying your chatbot to a real website in less than five minutes. It will teach you to plan, build, test, analyze, and deploy your first chatbot.



Machine Learning with R

In this course, you will learn how to write R code, learn about R's data structures, and create your own functions. With the knowledge gained, you will be ready to undertake your first very own data analysis. You'll further learn about supervised vs. unsupervised learning, look into how statistical modeling relates to Machine Learning, and do a comparison of each using R.



Git and GitHub Training

Learn the basics of Git—a version control system (VCS), and understand how to set up Git in your system, list the three-stage workflow in Git, create branches and track files, create a repository in Git and GitHub, and more.



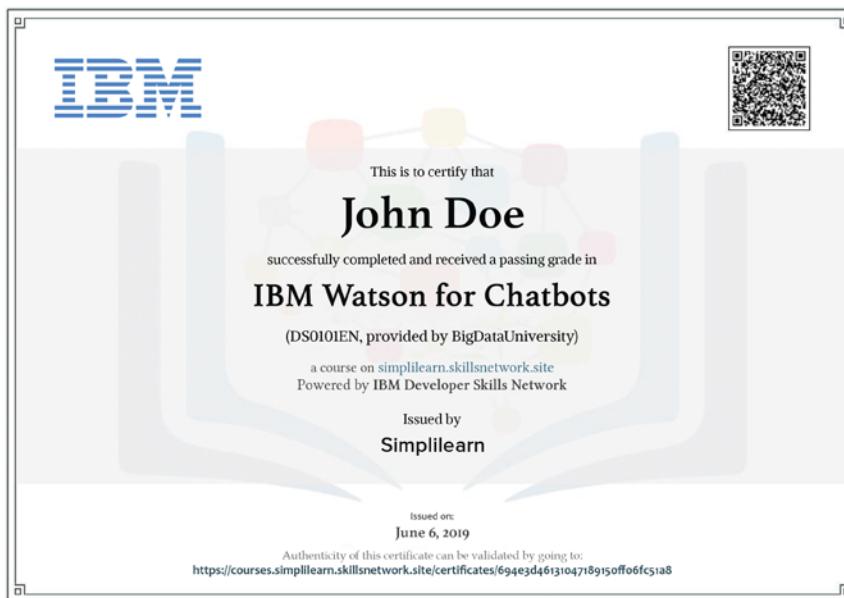
Academic Master Class – Purdue University

Attend an online interactive masterclass and get insights about advancements in technology/techniques in data science and AI.

Industry Master Class – Artificial Intelligence

Attend this online interactive industry master class to gain insights about advancements in data science, AI, and machine learning techniques.

Certification



Upon completion of this Post Graduate Program in AI and Machine Learning in partnership with Purdue University, you will receive the Post Graduate certification from Purdue University and IBM. You will also receive certificates from Simplilearn for the AI and machine learning courses in the learning path. These certificates will testify to your skills as an expert in AI and machine learning.

Advisory Board Members



Dr. Christopher G. Brinton

[Assistant Professor of Electrical and Computer Engineering at Purdue University](#)

Dr. Christopher G. Brinton, assistant professor at Purdue University and co-founder of machine intelligence analytics company Zoomi, Inc., specializes in research on AI and networks. He has built award-winning social learning network algorithms and network optimization models.



Patrick J. Wolfe

[Frederick L. Hovde Dean of Science at Purdue University](#)

Patrick J. Wolfe, an award-winning researcher in the mathematical foundations of data science, is the Frederick L. Hovde Dean of Science at Purdue University and named the 2018 Distinguished Lecturer in Data Science by the IEEE. He provides expert advice on applications of data science.



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