

Post Graduate Program In

DATA SCIENCE
& BUSINESS
ANALYTICS
CURRICULUM
GUIDE

Delivered in collaboration with:



## About the Program

The Post Graduate Program in Data Science and Business Analytics (PGP-DSBA) uniquely combines a comprehensive curriculum, covering the most widely-used tools and techniques in the industry, with a hands-on learning approach. A structured learning journey keeps you on track throughout as you achieve your weekly learning milestones with your mentor and benefit from their rich professional experience. On successful completion, you are awarded a certificate from McCombs School of Business at The University of Texas at Austin.

## Program Pedagogy



Recorded Video Lectures



Interactive
Mentor-Led Sessions



7+ Hands-On Projects



Quizzes



30+ Case Studies



## Key Learning Outcomes

Build your expertise in the most widely-used analytics tools and technologies.

Develop the ability to independently solve business problems using analytics and Data Science.

Understand the applications and implications of Data Science in different industries.

Learn how to extract strategic business insights from data and efficiently communicate them to stakeholders.

Build models to predict future trends and use them to inform business strategy.

Build a substantial body of work and an industry -ready portfolio in Data Science and analytics.

## Module-Wise Curriculum

#### Module 0

Learn the fundamentals of Python and programming to lay the foundations on which the rest of the course will be built. The module is released on enrollment.

- Basics of Programming
- Introduction to Python

#### **Module 1**

1 Project | 4 Quizzes | 8 Case Studies

#### **Python Foundations**

Build the foundational skills for data analysis with Python, such as importing, reading, manipulating, and visualizing data.

- Introduction to Python Programming
- NumPy, Pandas
- Exploratory Data Analysis
- Matplotlib, Seaborn

#### Sample Project 1:

Perform exploratory data analysis to understand the popularity trends of movie genres and derive patterns in movie viewership.

#### Module 2

1 Project | 2 Quizzes | 4 Case Studies

#### **Business Statistics**

Understand the role of statistics in helping organizations take effective decisions, learn its most widely-used tools and learn to solve business problems using analysis, data interpretation and experiments.

- Probability and Probability Distributions
- Sampling Distribution and Central Limit Theorem
- Hypothesis Testing and Associated errors
- ANOVA and Chi-square test

#### Sample Project 2:

Help an insurance agency identify important patterns in data through statistical methods.

### Module-Wise Curriculum

#### **Self-Paced**

1 Project | 3 Quizzes

#### Data Visualization with Tableau

Master the fundamentals of communicating information efficiently to business users via information graphics. Learn to recognize visual characteristics of data, choose appropriate display mechanisms, and transform data into actionable insights through Data Visualization with Tableau.

- Essential Design Principles Of Tableau
- Creating Visualizations With Tableau
- Telling Stories With Visualization

#### Sample Project 1:

Create interactive dashboards using Tableau's data visualization tools to provide policy-level insights to the CEO of an insurance company.

#### Module 3

1 Project | 2 Quizzes | 4 Case Studies

#### Supervised Learning-Foundations

Explore the fundamentals of Supervised Machine Learning, its key concepts and types. You will also learn how to pre-process data to prepare it for modelling.

- Data Preparation for Modelling
- Simple Linear Regression
- Multiple Linear Regression
- Goodness of Fit
- Measures of Regression Fit

#### Sample Project 3

Utilise historical data of a banking firm's loan defaulters to predict expected loss for a given customer.

#### **Module 4**

1 Project | 2 Quizzes | 4 Case Studies

#### Supervised Learning-Classification

Learn the conceptual frameworks of building classification models for accurate prediction in business contexts through popular ML approaches such as Logistic Regression and Decision Trees.

- Logistic Regression
- Decision Trees
- Evaluation of Classification Models, ROC and AUC

#### Sample Project 4

Identify potential loan customers for a bank by building a classification model that identifies candidates with a higher probability of purchasing a loan.

## Module-Wise Curriculum

#### **Module 5**

1 Project | 2 Quizzes | 4 Case Studies

#### **Ensemble Techniques**

Ensemble methods help to improve the predictive performance of Machine Learning models. In this course, you will learn about Ensemble methods such as 'Random Forest' that combine several Machine Learning techniques into one predictive model in order to decrease variance, bias, or improve predictions.

- Ensemble Methods-Bagging, Boosting and Stacking
- Random Forest
- AdaBoost, GBM, XGM, XGBM

#### Sample Project 5

Build a model to assist the marketing team of a company in identifying potential customers for a term deposit subscription.

#### Module 6

1 Project | 2 Quizzes | 4 Case Studies

#### **Model Tuning**

Model building is an iterative process. Employing Feature Engineering techniques along with a careful model selection exercise helps to improve the model. Further, tuning the model is an important step to arrive at the best possible result. This module talks about the steps and processes around these.

- Feature Engineering
- Sampling and Smote, Regularization
- Pipelining
- Model Performance Measures

#### Sample Project 6

Perform Feature Engineering and Model Tuning on a model designed to predict the strength of construction material to enhance accuracy.

#### Module 7

1 Project | 2 Quizzes | 4 Case Studies

#### **Unsupervised Learning**

Unsupervised Learning finds hidden patterns or intrinsic structures in data. In this course, you will learn about commonly-used clustering techniques like K-Means Clustering and Hierarchical Clustering.

- K-means Clustering
- Hierarchical Clustering

#### Sample Project 7

Identify different segments from a bank's existing customer pool based on their spending patterns as well as past interactions with the bank.

## **Self-Paced Modules**

**Module 8** 

1 Project | 3 Quizzes

#### **Data Visualization with Tableau**

Master the fundamentals of communicating information efficiently to business users via information graphics. Learn to recognize visual characteristics of data, choose appropriate display mechanisms, and transform data into actionable insights through Data Visualization with Tableau.

- Essential Design Principles Of Tableau
- Creating Visualizations With Tableau
- Telling Stories With Visualization

#### Sample Project 8

Create interactive dashboards using Tableau's data visualization tools to provide policy-level insights to the CEO of an insurance company.

Module 9

1 Project | 1 Case Study

#### **Time Series Forecasting**

Time Series Analysis is used for prediction problems that involve a time component. In this module, you will build foundational knowledge of Time Series Analysis in Python and its applications in business contexts.

- Introduction to Time Series
- Seasonality
- Decomposition

Module 10

1 Project | 1 Case Study

#### Marketing and Retail Analytics

Learn the applications of data analytics to marketing and retail. Understand how marketing analytics can be utilized to further marketing objectives and measure, improve, and predict performance.

- Marketing and Retail Terminologies: Review
- Customer Analytics
- Retail Dashboards
- Customer Churn
- Association Rules Mining

#### Web and Social Media Analytics

Learn how the data collected from websites and social media can be used to make business decisions through different types of web and social media analytics.

- Web Analytics: Understanding the Metrics
- Basic & Advanced Web Metrics
- Google Analytics: Demo and Hands-on Supply Chain and Logistics Analytics
- Text Mining

#### Module 12

1 Project | 1 Case Study

#### **Supply Chain and Logistics Analytics**

Learn how supply chain analytics can help businesses predict future demand, decide on inventory, understand customer needs, and optimize business costs.

- Introduction to Supply Chain
- Demand Uncertainty
- Inventory Control & Management
- Inventory Classification Methods
- Procurement Analytics
- Inventory Modeling (Reorder Point, Safety Stock)
- Advanced Forecasting Methods

#### **Module 13**

1 Project | 1 Case Study

#### **Finance And Risk Analytics**

Learn the applications of data analytics in finance and risk management such as fraud detection, credit risk, probability of default modeling, etc.

- Why Credit Risk-Using a Market Case Study
- Comparison of Credit Risk Models
- Overview of Probability of Default (PD) Modeling
- Fraud Detection
- PD Models, Types of Models, Steps to Making a Good Model
- Market Risk
- Value at Risk Using Stock Case Study Project

# Why are Some Modules Self-paced?

The self-paced modules cater to skills that are complementary to those learnt in guided modules. Since all learners do not need to/may not want to learn them, they have been kept as part of self-paced modules.

All these modules have similar high-quality recorded video lectures by UT Austin faculty, global academicians, and industry experts but do not have mentorship sessions. You can learn them at your own pace and schedule, based on your interests and the current and future demands of your role.

For all academic and non-academic questions in these modules, your Program Manager will be there to assist you.

## **Testimonials**



"I quite enjoy mentored learning sessions. The mentor is quite good and continues to check-in with learners by asking questions."

Jody Chilton, Chief Strategy Officer, OSN (United Kingdom)



"There are many providers in the market and some even offer their training for free. Yet, I decided to choose the programme by Great Learning. They provide prompt and proactive support services to improve our learning experiences."

Dr. Tan Kimlim, Senior Associate Engineer, Microsoft (Australia)



"It's been a positive learning experience for me, as someone who has close to zero background on statistics and coding, and has helped me to gradually overcome the initial apprehension that I was signing up for more than I could handle."

Joanna Liew,
Founder & Director, Perceptive
Consulting Pte. Ltd. (Singapore)



"I liked the content of the course materials, video lectures including the knowledge and expertise of the lecturer and mentor. Outstanding!"

Salem Anwar Khan,
Planning and Performance
Manager, BP (Oman)

## Ready to Advance Your Career?

**APPLY NOW** 

### Speak to a Program Advisor

Have questions about the program or how it fits in with your career goals?

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