PHI SCIENCE

DATA SCIENCE SPECIALIZATION

ONLINE COURSE - ILT

Develop a deep understanding of Data analysis & acquire the skillset to support you in extracting systematic insight into how to solve technical problems

64 Hours Of ILT - Sessions

17 Hours Of Ta - Sessions

24 Hours Of Self-paced

Free Access To Datacamp Courses

DATA SCIENCE & ML SPECIALIZATION

The Data Science market is on exponential growth! With the huge rise of big data, tech companies around the world are recruiting Data Scientists and engineers to do the job of collecting, manipulating, and visualizing data. This program is designed and optimized to assist you develop a strong base in data science. Through diving deep into core principles of programming and AI integration, data deployment and monitoring are necessary for building true insights to excel in solving different technical issues. You will start by learning the pre-data analysis skills like programming, and key concepts of Data Science. Afterwards, you will learn how to manipulate, deploy and visualize data for different purposes, and eventually to apply what you have learnt on real-life matters to serve various purposes.

Graduates of this specialization will be able to walk away with:

Technical Skills:

Statistical analysis and Computing, Data Wrangling, Big Data Analysis, Statistics, Machine Learning & Data Visualization.

Non-technical skills:

Communication Skills, Structured Thinking, Storytelling Skills, Problem-Solving, Decision Making.

PHI SCIENCE

SYLLABUS

Build and refine your knowledge of Data Science fundamentals and practices as you work through the weekly modules of this online specialization.

PHASE I: INITIAL COURSES — 26 CREDITS

COURSE 1: INTRODUCTION TO DATA SCIENCE - PREREQUISITE COURSE

11 HRS - ILT

Discuss the steps involved in data science, from data acquisition to final insights and describe the potential of DS in several domains..

OUTCOMES:

- History & Fundamentals of Data Science, Machine Learning and Artificial Intelligence.

SCHEDULE:

Lecturing days: lectures are supposed to be conducted on **Wednesday** on a weekly basis over the month.

teaching hours will be conducted in the afternoon - due to the difference between time zones, in the period of **4:00 Pm - 9:00 Pm (KSA)** on a time average **of 2-3 h per session**.

WEEK 1	*3 HRS - ILT*	Overview of Data Science, Terms and Definitions, Real-Life Applications & Notable Examples	• Week 1 hands-on assignment
WEEK 2	*2 HRS - ILT*	Sources of Data Structured, Unstructured, Streamin.	• Week 2 hands-on assignment
WEEK 3	*2 HRS - ILT*	Typical Data Sources, and their Data Type.	• Week 3 hands-on assignment
WEEK 4	*2 HRS - ILT*	The 4 V's of Data: (Volume, Variety, Velocity, Veracity).	• Week 4 hands-on assignment
WEEK 5	*2 HRS - ILT*	Introduction to Probability Theory, What Are Probabilities and Probability Distributions.	• Week 5 hands-on assignment

---

COURSE 2: PYTHON AND DATA SCIENCE TOOLKITS - PREREQUISITE COURSE

9 HRS - ILT

All libraries for data science and machine learning environments and how to set up a big data analysis space. (Discuss latest NLP research & Running practical examples on Jupyter notebook for multiple domains).

OUTCOMES:

- Pandas, Scikit Learn, and ML toolkits (implementation).

SCHEDULE:

Lecturing days: lectures are supposed to be conducted on **Saturdays** on a weekly basis over the month.

Lecturing times: teaching hours will be conducted in the afternoon - due to the difference between time zones, in the period of **4:00 Pm - 9:00 Pm (KSA)** on a time average of **2-3h per session.**

WEEK 1	3 HRS - ILT	Python Introduction, Data science Toolkits	• DataCamp Content • Week 1 hands-on assignment
WEEK 2	2 HRS - ILT	Pre-processing of Data, Stages of Data Processing	• DataCamp Content • Week 1 hands-on assignment
WEEK 3	2 HRS - ILT	Methods and Types of Data Processing	• DataCamp Content • Week 1 hands-on assignment
WEEK 4	2 HRS - ILT	Output Formats of Processed Data, Lightweight analysis	• DataCamp Content • Week 1 hands-on assignment

PHASE II: CORE COURSES 72 CREDITS

COURSE 1: EXPLORATORY DATA ANALYSIS AND DATA ENGINEERING

22 HRS - ILT

Understand the given problem. Prepare the data for statistical analysis and patterns detection to be used for features engineering & extraction.

OUTCOMES:

- Data Preprocessing and Data Cleaning. Data Engineering and Sampling techniques.

SCHEDULE:

Lecturing days: lectures are supposed to be conducted on **Saturday and Wednesday** on a weekly basis throughout the month.

Lecturing times: teaching hours will be conducted in the **mornings** - due to the difference between time zones, in the period of **4:00 Pm - 9:00 Pm (KSA)** on a time average of **4h per Saturday's session, 4:00 Pm - 8:00 Pm (KSA)** on a time average of **1-2h per Wednesday's session.**

WEEK 1	4HRS - ILT	Transformation of Data (Normalization and Aggregation), Reduction of Data Dimensionality	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 2	4HRS - ILT	Cleansing of data (inaccuracy, incompleteness.	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 3	4HRS - ILT	Inconsistency de-replication, Pattern Detection in Data, Examples of Problem Understanding	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 4	4HRS - ILT	Propose Machine Learning Problems be solved in the next core course	• Weekly Recap Session • Weekly Assignment • Self-Paced Content

COURSE 2: MACHINE LEARNING FOR DATA SCIENCE

22 HRS - ILT

Extract significant Features from the data space and make it ready for the ML models. Constructing different classifiers to create several predictive Machine Learning algorithms.

OUTCOMES:

- Apply supervised and unsupervised machine learning algorithms at the extracted features to train several algorithms for the given task.

SCHEDULE:

Lecturing days: lectures are supposed to be conducted on **Saturday and Wednesday** on a weekly basis throughout the month.

Lecturing times: teaching hours will be conducted in the **mornings** - due to the difference between time zones, in the period of **4:00 Pm - 9:00 Pm (KSA)** on a time average of **4h per Saturday's session**, **4:00 Pm - 8:00 Pm (KSA)** on a time average of **1-2h per Wednesday's session.**

WEEK 1	4HRS - ILT	Selected Mathematical Techniques, Correlation Analysis between dependent and Independent Variables, Linear Regression.	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 2	4HRS - ILT	Principal Component Analysis, Clustering, Time-series Forecasting, Selected Artificial Intelligence Techniques	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 3	4HRS - ILT	Support Vector Machines, Neural Networks and Deep Learning, Feed-forward Networks, Convolutional Networks.	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 4	4HRS - ILT	Reinforcement Learning, Overview of Further Approaches.	• Weekly Recap Session • Weekly Assignment • Self-Paced Content

COURSE 3: DATA VISUALIZATION & EVALUATION (WITH SPECIAL TOPICS

17 HRS - ILT

Visualization in different formats and decision-making processes. (Special topics as deep neural network use cases).

OUTCOMES:

- Visualize the prediction results and evaluate different ML algorithms and takes a decision based on the generated ML models.

SCHEDULE:

Lecturing days: lectures are supposed to be conducted on **Saturday and Wednesday** on a weekly basis throughout the month.

Lecturing times: teaching hours will be conducted in the **mornings** - due to the difference between time zones, in the period of **4:00 Pm - 9:00 Pm (KSA)** on a time average of **4h per Saturday's session, 4:00 Pm - 8:00 Pm (KSA)** on a time average of **1-2h per Wednesday's session.**

WEEK 1	4HRS - ILT	Data Visualization, Evaluation of Data Science in Cloud	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 2	4HRS - ILT	Decision Making Processes, Overview of Relevant Metrics	• Weekly Recap Session • Weekly Assignment • Self-Paced Content
WEEK 3	4HRS - ILT	Special Topics in NLP.	• Weekly Recap Session • Weekly Assignment • Self-Paced Content

CAPSTONE PROJECT 15 CREDITS

BUILD A REAL-WORLD PROJECT

10 HRS - ILT

Multiple research and project ideas can be proposed based on learners' daily work domain.

OUTCOMES:	• Hands-on experience in Jupyter, Python 3, Pandas, and sci-kit learn Libraries.
WEEK 8	• Team formation and project selection
WEEK 9	• Start working
WEEK 15 ,14 ,13 ,12	• Design and implementation
WEEK 16,17	• Documentation • Presentation & Graduation Day

TOPICS:

- Social Computing
- Predictive Financial Markets
- Clinical Data Science
- Markets Segmentations
- Business Intelligence
- Weather Forecasting
- Chimo, Bio, Medical data science ideas.

PROGRAM REWARDS

Mentorship session

Graduates who successfully did it to the finish line will have the opportunity to attend Peer-to-Peer sessions, to get career advice based on their progress and evaluation along with the specialization. Besides all that, they will be supported in building their LinkedIn profiles to appear with a professional look. Moreover, they might get endorsed to pursue a certain position in the field. Your instructors will be also part of your connections network, this will let you build great potential & bring you superior opportunities.

Well recognized portfolio

You will prepare a portfolio that will give you the opportunity to show your potential employers what you can actually do. In this portfolio, you can include the final project that you have worked on during the cohort.

Your Certificates

- **Certificate of Completion**
  Earn your completion certificate, and get your recognition of your newly developed skills. Assessment is continuous and based on a series of practical evaluations completed online on Phi's LMS & completed a comprehensive application of a real-world project. In order to be issued with a Phi certificate of completion, you'll need to meet the requirements outlined in this course guide brochure. Course brochure should be available as soon as enrolling in this specialization. Your certificate will be issued in your legal name and sent to you upon successful completion of the course, as per the stipulated requirements.

- **Certificate of Recognition**
  To get an honorable mention on a certificate, you should come up with a total grade in both the project and practical evaluation that exceeds %85.

- **Recommendation Letter**
  You can earn such a letter signed by your instructor once you complete your final project.

JOIN & LEARN WITH THE BEST

INSTRUCTOR

Hamza Farooq

Data Science Manager at Google

Hamza currently works at Google as Data Science Manager and is also serving as an Adjunct Professor at the University of Minnesota. Hamza has 10+ of experience in leading DS/ML teams. He's a regular speaker at conferences and has also led numerous training and consultation sessions for various organizations.

INSTRUCTOR

Dalyah Aljamal

Data & AI Consultant

Data & AI Consultant. MSc in AI and Data Science. Executed a couple of Industrial and academic data science projects. Passionate about NLP and creating impact with data

TEACHING ASSISTANT

Malek Abu Raddaha

Data Scientist & Research And Teaching Assistant at University of Michigan

A Data Scientist worked on a variety of projects in computer vision, NLP domains, and more. With several years of experience in education, research, and data science. Currently, pursuing his Ph.D. at the University of Michigan, US with a focus on Deep Learning, ML, Embedded systems, and mobile robotics.

FREQUENTLY ASKED QUESTIONS

1-What is the difference between Data Analysts vs. Data scientists?

Data Analyst is considered to be a more junior position than Data Scientist, where their major role is to sift through data and provide reports and visualizations to explain what insights the data hiding. On the other side, Data scientists tend to collect data and analyze it, garner actionable insights, and share them with their organization.

This program is introductory but comprehensive in teaching data science from the very beginning, like diving into machine learning, programming with Python, on the Another hand is more beginner-friendly with a focus on descriptive analytics and industry-standard tools and software.

2-How do I know if this program is right for me?

This Specialization is ideal for you if you're a graduate in such STEM fields. Candidates should know statistics, calculus, linear Algebra, but programming is a plus. This specialization is great preparation for those who aim to advance their skills in Data.

You're going to learn Python commands and toolkits from scratch, and get to know some theories related to data and ML. Afterward, to understand the real applications and data manipulation to come up with insightful outputs. Contact the Admission team for more guidance.

3-What tools and software do we use and learn?

By enrolling in the DS specialization, you will gain hands-on experience with Anaconda, Jupyter Notebooks, and you will learn programming with python as well as libraries like Pandas and ML toolkits. You'll also use different tools to import, clean, manipulate and visualize data.

4-Can I skip a certain course?

Not exactly, you can only waive courses in the initial phase (prerequisites kit). We recommend you to apply and join these foundational courses, to learn basic components before digging deep into the advanced level since the whole curriculum is designed following the synoptic methodology. You can waive these courses upon your responsibility if your submitted documents met our criteria. (Read more in the syllabus)

5-Is this program accredited?

This specialization program is non-academia-recognized. Our DS&ML professional training kit is designed and developed in collaboration with the industrial leads in the field, learning outcomes and the curriculum are articulated to meet market-based and in-demand skillset in such vacancies globally and regionally. Once completed the program, you will be qualified to apply for entry-level jobs in the field.

6-Does Phi Science offer financial aid or discounts?

As part of paying back to our society, Phi is glad to provide up to 2 full scholarships for any of its specializations.

Please submit your application form. Moreover, you can get your early-bird registration discount when enrolling in any of the announced programs 2 weeks at least before the kick-off day.

PHI
SCIENCE

PHI.SCIENCE
US: +1 617 870 9667 | JO: +962 79 653 6079
INFO@PHI.SCIENCE