

Curriculum

International Data Science Certificate Program



DACH
Dalilna Chools

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 1 TO 5

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 1	Data Science Introduction	- Demo: Introduction to types of analytics - Project life cycle - LMS walk through	Concepts	Y		Case Study 1 : Understanding DMBOK
Day 2	Data Science Life cycle	- Demo: data management - Data ethics, governance, risk & compliance, DMBOK model	Concepts	Y		
Day 3	Business Statistics - Module 1	Data types, measure of central tendency, measures of dispersion	Concepts - Minitab	Y		
Day 4	Business Statistics - Module 2	Data collection plan, techniques, sampling size, market research	Concepts - Minitab	Y		
Day 5	Business Statistics - Module 3	- Graphical techniques - Skewness & kurtosis - Box plot	Concepts - Minitab	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 6 TO 10

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 6	Business Statistics Module 4	- Graphical charts in healthcare - Retail analytics - Measures Vs metrics	Concepts – Minitab	Y		Case Study 2 : Understanding Business Statistics in Decision Making
Day 7	Business Statistics - Module 5	7 QC tools - Advance graphical charts, pareto, time series	Concepts – Minitab	Y		
Day 8	R - Module 1	- IR, R studio - Descriptive stats in R & understanding various tools & techniques in R Such as Lintr - Caret, book down, color picker - Datasets. load, google AuthR	R Studio	Y		
Day 9	R - Module 2	- Advance functionalities in R: Data frames, typecasting, reading and writing data - Accessing built-in datasets - Conditional and loop statements, functions and more	R Studio	Y		
Day 10	Python - Module 1	- Python and Libraries - Jupyter notebook - Set up GitHub	Python	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 11 TO 15

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 11	Python - Module 2	• Deep dive into Python • Object oriented programming • Functional programming	Python: Numpy, Pandas	Y	Capstone Project 1 – Using R - Studio	
Day 12	Python - Module 2	Data visualization: The graphical representation of data and information.	Matplotlib,	Y		
Day 13	Python - Module 2	• Machine learning • Deep learning	Seaborn, Scikit Learn, Tensor Flow	Y		
Day 14	Python - Module 3	Descriptive stats in Python, Pandas and Matplotlib.	Python & Matplotlib	Y		
Day 15	Python - Module 3	Descriptive stats in Python, Pandas and Matplotlib	Python & Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 16 TO 20

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 16	Python - Module 3	Random variable, probability, probability distribution, normal distribution, SND, expected value	Concepts	Y	Capstone Project I – Using R - Studio	
Day 17	Python - Module 3	Random variable, probability, probability distribution, normal distribution SND, expected value	Concepts	Y		
Day 18	Python - Module 3	Sampling funnel, sampling variation, central limit theorem, confidence interval	Python	Y		
Day 19	Python - Module 3	Sampling funnel, sampling variation, central limit theorem, confidence interval	Python	Y		
Day 20	Python - Module 3	Hypothesis testing principles, 2 proportion test, 2 t sample, 1t test	Python	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 21 TO 25

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 21	Python - Module 3	Advance hypothesis testing & hypothesis generation for data science projects	Python	Y		Research I – Understanding Advance Statistics in Business Decision Making
Day 22	Python - Module 3	Anova, statistical differences, MEANS of 3 or more independent group, Chi square, significant association between 2 categorical variables	Python	Y		
Day 23	Python - Module 3	Anova, statistical differences, MEANS of 3 or more independent group, Chi square, significant association between 2 categorical variables	Python	Y		
Day 24	Python - Module 3	- Data cleaning, imputation techniques - Data analysis and visualization (scatter diagram, correlation analysis, transformations)	Python	Y		
Day 25	Python - Module 3	- Data Cleaning, imputation techniques - Data analysis and visualization (20+ Charts using data Pine, data Box, SPSS/Minitab)	Python	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM- DAY 26 TO 30

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 26	Python - Module 3	- Principles of regression, - Intro to simple linear regression	Python	Y		Case Study 3: Application of Regression in Data World
Day 27	Python - Module 3	- Principles of regression, - Intro to simple linear regression	Python	Y		
Day 28	Python - Module 3	Multiple linear regression	Python	Y		
Day 29	Python - Module 3	Multiple linear regression	Python	Y		
Day 30	Python - Module 3	Logistic regression	Python	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 31 TO 35

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 31	Python - Module 3	Logistic regression	Python	Y	Capstone Project 2 : Python Applications – Real time Data	
Day 32	Python - Module 3	- Python model deployment: Amazon SageMaker, system security analysis - Google cloud AI platform, and MICROSOFT Azure machine learning	Python	Y		
Day 33	Python - Module 3	- Python model deployment and understanding flask - DJANGO, Streamlit, FASTAPI	Python	Y		
Day 34	Machine Learning - Module 1	- Clustering introduction: Hierarchical method, constraint-based method - Grid-Based method, Partitioning method, Density-based method	Concepts	Y		
Day 35	Machine Learning - Module 2	- K-means, Hierarchical, DBSCAN, OPTICS, Mean-shift, spectral - Affinity propagation, and BIRCH, Gaussian Mixture models	Python, R , Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 36 TO 40

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 36	Machine Learning Module 3	- K-means, Hierarchical, DBSCAN, OPTICS, Mean-shift, spectral - Affinity propagation, and BIRCH, Gaussian mixture models	Python, R , Matplotlib	Y		Research 2 : Principal component Analysis – SPSS / Minitab
Day 37	Machine Learning Module 4	PCA, tSNE , linear discriminant Analysis & Auto Encoders	Python, Matplotlib	Y		
Day 38	Machine Learning Module 5	PCA, tSNE , linear discriminant Analysis & Auto Encoders	Python, Matplotlib	Y		
Day 39	Machine Learning Module 6	Apriori algorithm, frequent pattern growth, Eclat, sequential pattern mining	Python, Matplotlib	Y		
Day 40	Machine Learning Module 7	Apriori algorithm, frequent pattern growth, Eclat, sequential pattern mining	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 41 TO 45

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 41	Machine Learning - Module 8	Association rules mining	Python, Matplotlib	Y		Case Study 4: Supervised Vs Unsupervised Techniques in Data Science:
Day 42	Machine Learning - Module 9	Supervised machine learning concept (regression, classification, clustering, and reinforcement learning)	Python, Matplotlib	Y		
Day 43	Machine Learning - Module 10	Supervised machine learning concept (regression, classification, clustering, and reinforcement learning)	Python, Matplotlib	Y		
Day 44	Machine Learning - Module 11	Decision Tree(C5.0), Classification and Regression Trees (CART), Random Forest (RF), and Gradient Boosting Decision Trees (GBDT)	Python, Matplotlib	Y		
Day 45	Machine Learning - Module 12	Decision Tree(C5.0), Classification and Regression Trees (CART), Random Forest (RF), and Gradient Boosting Decision Trees (GBDT)	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 46 TO 50

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 46	Machine Learning - Module 13	EDA -2 (encoding methods, one hot encoding, binary encoding, label Encoders, target encoders, hashing encoding, ordinal encoding, outlier detection-isolation forest) and calculating the Predictive Power Score (PPS)	Python, Matplotlib	Y		Case Study 4: Supervised Vs Unsupervised Techniques in Data Science:
Day 47	Machine Learning - Module 13	EDA -2 (encoding methods, one hot encoding, binary encoding, label Encoders, target encoders, hashing encoding, ordinal encoding, outlier detection-isolation forest) and calculating the Predictive Power Score (PPS)	Python, Matplotlib	Y		
Day 48	Machine Learning - Module 14	Feature engineering (tree-based methods, RFE,PCA), feature tools, Scikit-learn, Pandas, Keras, TensorFlow	Python, Matplotlib	Y		
Day 49	Machine Learning - Module 14	Feature engineering (tree-based methods, RFE,PCA), feature tools, Scikit-learn, Pandas, Keras, TensorFlow	Python, Matplotlib	Y		
Day 50	Machine Learning - Module 15	Model validation methods (train-test, cross validation, shuffle CV, accuracy methods) Bootstrap, Leave – One, out cross validation, Monte Carlo cross validation	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 51 TO 55

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 51	Machine Learning - Module 15	Model validation methods (train-test, cross validation, shuffle CV, accuracy methods) Bootstrap, Leave – One, out cross validation, Monte Carlo cross validation	Python, Matplotlib	Y		
Day 52	Machine Learning - Module 16	Bagging & Random Forest, boosting, stacking	Python, Matplotlib	Y		
Day 53	Machine Learning - Module 16	Bagging & Random Forest, boosting, stacking	Python, Matplotlib	Y		
Day 54	Machine Learning - Module 17	Gradient boosting algorithm, XGBoost M-Trees Depth Wise, Light GBM, Tree's Leaf Wise	Python, Matplotlib	Y		
Day 55	Machine Learning - Module 17	Gradient boosting algorithm, XGBoost M-Trees Depth Wise, Light GBM, Tree's Leaf Wise	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 56 TO 60

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 56	Machine Learning - Module 18	K-Nearest Neighbors, Support Vector Machines, Random Forest	Python, Matplotlib	Y	Capstone Project 3 : Application of Machine Learning - Matplotlib – Real time data	
Day 57	Machine Learning - Module 18	K-Nearest Neighbors, Support Vector Machines, Random Forest	Python, Matplotlib	Y		
Day 58	Machine Learning - Module 19	L1 - Lasso Regression, Elastic Net and L2 - Ridge Regressions, using Scikit Learn, Tensor Flow, Keras, Pytorch	Python, Matplotlib	Y		
Day 59	Machine Learning - Module 19	L1 - Lasso Regression, Elastic Net and L2 - Ridge Regressions, using Scikit Learn, Tensor Flow, Keras, Pytorch	Python, Matplotlib	Y		
Day 60	Machine Learning - Module 20	ANN, Optimization algorithm (gradient descent), stochastic gradient descent (intro), back Propagation method using TensorFlow, Keras, PyTorch, Scikit, learn, and MATLAB	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 61 TO 65

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 61	Machine Learning - Module 20	ANN, Optimization algorithm (gradient descent), stochastic gradient descent (intro), back Propagation method using TensorFlow, Keras, PyTorch, Scikit, learn, and MATLAB	Python, Matplotlib	Y	Capstone Project 3 : Application of Machine Learning - Matplotlib – Real time data	
Day 62	Deep Learning - Module 1	Deep dive, speech recognition, image recognition, pattern recognition using TensorFlow, Keras, PyTorch, Scikit-learn, and MATLAB	Python, Matplotlib	Y		
Day 63	Deep Learning - Module 2	Introduction to Text Mining, VSM, Intro to word embeddings using information extraction, sentiment analysis, topic modelling, text classification	Python, Matplotlib	Y		
Day 64	Deep Learning - Module 2	Introduction to Text Mining, VSM, Intro to word embeddings using information extraction, sentiment analysis, topic modelling, text classification	Python, Matplotlib	Y		
Day 65	Deep Learning - Module 3	Word clouds and document similarity using cosine similarity, named entity recognition	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 66 TO 70

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 66	Deep Learning - Module 3	Word clouds and document similarity using cosine similarity, named entity recognition	Python, Matplotlib	Y	Capstone Project 3 : Application of Deep Learning – Real time data	
Day 67	Deep Learning - Module 4	- Powerful modeling sequence data such as time series or natural language - Recurrent neural network tools in data science include TensorFlow, Keras, PyTorch, Scikit-learn, and MATLAB	Python, Matplotlib	Y		
Day 68	Deep Learning - Module 5	Generate synthetic data such as images, music, speech, or text that is similar to what humans produce. TensorFlow, Keras, PyTorch, Scikit-learn, and MATLAB	Python, Matplotlib	Y		
Day 69	Deep Learning - Module 6	- Autoencoders can be used for image denoising, image compression, and, in some cases, even generation of image data - Transfer learning is the reuse of a pre-trained model on a new problem Concept of deep learning because it can train deep neural networks with comparatively little data.	Python, Matplotlib	Y		
Day 70	Deep Learning - Module 7	Probabilistic algorithms, text classification using Naïve Bayes, emotion mining, spam filtering & sentimental analysis. Using TensorFlow, Keras, PyTorch, Scikit-learn, and MATLAB	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 71 TO 75

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 71	Deep Learning - Module 7	Probabilistic algorithms, text classification using Naïve Bayes, emotion mining, spam filtering & sentimental analysis. Using TensorFlow, Keras, PyTorch, Scikit-learn, and MATLAB	Python, Matplotlib	Y		
Day 72	Time Series & Tableau - Module I	Introduction to time series, level, trend and seasonality, strategy, scatter plot, Lag plot, ACF, principles of visualization, Naïve forecasts	Tableau	Y		
Day 73	Time Series & Tableau - Module I	Introduction to time series, level, trend and seasonality, strategy, scatter plot, Lag plot, ACF, principles of visualization, Naïve forecasts	Tableau	Y		
Day 74	Forecasting - Module I	- Forecasting error and its metrics, model-based approaches - AR model for errors - Trend projection, market research, sales force composite, and Delphi method I. Python, R, MATLAB, and Julia	Python, Matplotlib	Y		
Day 75	Forecasting - Module I	- Forecasting error and its metrics, model-based approaches - AR model for errors - Trend projection, market research, sales force composite, and Delphi method I. Python, R, MATLAB, and Julia	Python, Matplotlib	Y		

TRAINING MODULES- INTERNATIONAL DATA SCIENCE PROGRAM – DAY 76 TO 80

Days	Main Topics	Subtopics	Tools – Software's or Templates	Assignment (Y/N)	Capstone Project (Y/N)	Research / Case Studies
Day 76	Forecasting - Module 2	AR Model for errors, data driven approaches, MA. Python, R, MATLAB, and Julia	Python, Matplotlib	Y	Capstone Project 5 Forecasting :	
Day 77	Forecasting - Module 2	AR Model for errors, data driven approaches, MA. Python, R, MATLAB, and Julia	Python, Matplotlib	Y		
Day 78	Forecasting - Module 3	Exp Smoothing, ARIMA, survival analysis, prophet, Python, R, MATLAB, and Julia	Python, Matplotlib	Y		
Day 79	Final Assessment	End to end data science project	-	-		
Day 80	Capstone Project Discussion	Final assessments	-	-		

Thank You

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