

Certification Examination Regulations and Course Description

This Certification Examination Regulations of the Steinbeis+Academy applies to the following course on the basis of the valid Framework for the Implementation of Certificate Courses (RZLG) in the current version.

Course title	Machine Learning				
Fields of competences	Management	Personality Development	Education Management	Healthcare	Technology
	X				X
Place(s) of implementation	Bengaluru (India)				
Graduation	Diploma of Advanced Studies (DAS)	Certificate of Advanced Studies (CAS)	Diploma of Basic Studies (DBS)	Certificate of Basic Studies (CBS)	
				X	
Qualification aim	Engineering Graduates and Working Professional from any domain, who has good logical, mathematical and analytical skills. Entry level : Machine Learning Engineers				
RZLG-Supplementary admission requirement					
Teaching method	Classroom	Classroom/ Online	Online		
		X			
Language	English				
Workload in hours	Total	Seminar time	Self-study time	Transfer time	
	48	40	2	6	

Type of performance records (LNW)	Examination (K)	Presentation/ oral examination (P)	Case (C)	Transfer papaer (TA)	Project study paper (PSA)
	X				

Contents

Modules	Key topics	Seminar time/h
Introduction to core python Programming	Overview of Python-Starting with Python; Why Python for data science?; Anaconda vs. python; Introduction to installation of Python and Packages; Introduction to Python Editors & IDE's(Jupyter,/lpython); Understand Jupyter notebook & Customize Settings; Data Types & Data objects/structures (strings, Tuples, Lists, Dictionaries); List and Dictionary Comprehensions; Debugging & Code profiling; Built-in Functions (Text, numeric, date, utility functions); User defined functions – Lambda functions	4
Datascience Project Lifecycle	Introduction to Types of analytics, project life cycle	1
Introduction to R Programming	Overview of R - Starting with R; Installation R and R studio; Data Types & Data structures; Data Importing and Exporting	2
Basic Statistics	Data Types,Measure Of central tendency,Sampling Funnel; Python DS Libraries (Pandas,Numpy,Scikit,matplotlib); Mesures of Dispersion,Expected Value; R coding; Random Variable,Probability,Probility Distribution (Normal and Logistic); Graphical Techniques (Bar,Boxplot and histogram etc); Skewness & Kurtosis, Sampling Variation	4
Inferential Statistics	CLT, Confidence interval; R coding; Introduction to concept with examples(2 proportion test, 2 t sample t test); Python DS coding concepts and challenges; Anova and Chisquare case studies; Python DS coding challenges	4

Linear Regression	Scatter Diagram, Corr Analysis, Principles of Regression; Python DS coding challenges; Intro to Simple Linear Regression; Python DS coding challenges; Multiple Linear Regression	3
Logistic Regression	Principles of Logistic regression; Python DS coding challenges; Multiple Logistic Regression, ROC curve, Gain chart, Chisquare theory - hands on Python DS coding challenges	3
Data Mining - Unsupervised-I	Clustering – Hierarchical; Python DS coding challenges; Clustering - KMeans	2
Dimension Reduction	PCA	1
Data Mining - Unsupervised-II	Unsupervised - Network Analytics(update the code in better way); Python DS coding challenges; Association Rules; Recommender System	5
Text Mining	Introduction to Text Mining and applications; Python DS coding challenges; Vector Space Method (VSM)[Text processing, TDM and Weights]; Python DS coding challenges; Word clouds and LDA; Latent Semantic Analysis (LSA); NLP introduction, NER and Emotion mining	2
Chatbot	Chatbot introduction,types bots and demo	1
Algorithms-I	Naïve Bayes; Python DS coding challenges; KNN; Decision Tree; Random Forest; Bagging, boosting and stocking - Part1; Bagging, boosting and stocking - Part2; XGBM; LGBM;	5
Regularization	Lasso and Ridge Regressions	1
Algorithms-II	ANN; Python DS coding challenges; SVM; Introduction to CNN and RNN	2