Certification Examination Regulations and Course Discription

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	Data Science				

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	The course is for professionals working on Business intelligence, Data Warehousing and reporting tools to improve their knowledge in data science. Engineering freshers with the qualification they are able to work as data analyst / Business Analyst: "entry-level" position in the data science field.

RZLG-Supplementary admission requirement	From any stream with good logical, mathametical and analogics skills. Working Professional from any domain, who has good logical, mathematical and analytical skills.

Teaching method	Classroom	Classroom/ Online	Online
		X	

Language	English			

Workload in hours	**Total**	Seminar time	Self-study time	Transfer time
	40	28	7	5

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,/Ipython); Understand Jupyternotebook & 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;	2
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 Rstudio; Data Types & Data structures; Data Importing and Exporting	1
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) R coding; Graphical Techniques (Bar,Boxplot and histogram etc); R coding; Skewness & Kurtosis, Sampling Variation; R coding	2
Interferential 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	2

Linear Regression	Scatter Diagram, Corr Analysis, Priciples of Regression; Python DS coding challenges; Intro to Simple Linear Regression; Python DS coding challenges; Multiple Linear Regression	2
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	2
Data Mining - Unsupervised-I	Clustering – Hierarchical; Python DS coding challenges; Clustering – Kmeans	
Dimension Reduction	PCA	1
Data Mining - Unsupervised-II	Unsupervised - Network Analytics(update the code in better way); Python DS coding challenges; Association Rules; Python DS coding challenges; Recomender System	1
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; Python DS coding challenges; Latent Semantic Analysis (LSA); Python DS coding challenges; NLP introduction, NER and Emotion mining;	3
Chatbot	Chatbot introduction,types bots and demo	2
Algorithms I	Naïve Bayes; KNN; Decision Tree; Random Forest; Bagging, boosting and stocking - Part1; Bagging, boosting and stocking - Part2; XGBM; LGBM	2
Regularization	Lasso and Ridge Regressions	2
Algorithms-II	SVM	1

Forecasting	Introduction to Timeseries, Level, Trend and Sesonality, strategy (Python DS coding challenges); Scatter plot, Lag plot, ACF, Principles of Visualization, Naïve forecasts (Introduction to R shiny (deployment)); Forecast in Error and it metrics, Model Based Approaches (Introduction to Python flask (deployment)); Model Based approach cont, AR Model for errors Data driven approaches, MA and exp Smoothing	2
Survival Analysis	Concept with a business case	2