SAS Academic Specialization
Statistics and Data Science using SAS

Academic Specialization Agreement

Between

STATISTICAL ANALYSIS SOFTWARE (SAS)

and the

DEPARTMENT OF STATISTICS

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS (hereafter AUEB)

This document describes the details of the SAS Academic Specialization titled "**Statistics and Data Science**" that can be attained by students enrolled in the full time *MSc in Statistics* program of the Department of Statistics in Athens University of Economics and Business (AUEB). The goal of the SAS Academic Specialization is to complement the Statistics and Data Science knowledge that

is offered in the *MSc in Statistics* program with relevant SAS skills that the job market expects from the Department's graduates. Students who successfully complete the requirements described in this document will receive a SAS Academic Specialization badge with a SAS/AUEB co-branded logo.

Academic Specialization Structure

The "Statistics and Data Science Using SAS" Academic Specialization is comprised of three courses, taught throughout three semesters as described in Table 1.

Course Names	Semester	Teaching Hours	Total Learning Hours
1.Data Analytics and Programming	1	6	30
2.Regression Techniques and Time Series Analysis	2	9	45
3.Machine Learning and Big Data Analytics	3	15	75

Table 1: Names and details of SAS courses that AUEB's MSc in Statistics full-time students must successfully complete to receive the "Statistics and Data Science Using SAS" Academic Specialization.

The courses in Table 1 will be taught by AUEB teaching personnel and by SAS experts and will be offered as optional labs that will be appended to the *MSc in Statistics* curriculum. To receive the Academic Specialization badge students must

i) *Attend at least 80% of the teaching hours and*
ii) *Receive a passing grade in five graded assignments*

The Department of Statistics can modify the ratio of teaching to total learning hours based on each year's teaching capacity, however, the aggregate total amount of learning hours for the three courses cannot drop below 150 hours.

Course Details

The SAS labs will expose students to SAS skills related to the material taught in MSc in Statistics courses (e.g., Computational Statistics, GLM, Statistical Learning, Statistics for Big data, Time Series Analysis).

1. **Data Analytics and Programming**
   - Intro to SAS ecosystem and SAS Studio environment
   - Access and clean Data (import, format, filter, sort, conditional processing)

- Explore data (create summary statistics, basic visualizations) + By variable
- Distributions, Hypothesis Tests

2. Regression Techniques and Time Series Analysis
- Continuous Response: Linear Models, ANOVA, GAM
- Categorical Response: GLM, Logistic Regression, Non-Gaussian, GAM
- Time Series data: ARIMA methodology

3. Machine Learning and Big Data Analytics
- Big Data Preparation, Cloud computing and SQL
- Decision Trees, Forests, Tree Ensembles
- Gradient Boosting, Neural Networks
- Model Assessment and Deployment
- Case Study

The SAS labs will contain instructional resources from the following SAS courses (click on the hyperlinks to see course outlines).

1. SAS Programming 1: Essentials
2. SAS Programming 2: Data Manipulation Techniques
3. Statistics 1: Introduction to ANOVA, Regression, and Logistic Regression
4. Predictive Modeling Using Logistic Regression
5. Machine Learning Using SAS Viya
6. SAS Visual Statistics in SAS Viya: Interactive Model Building

Students and all teaching personnel of the AUEB Department of Statistics can access the above self-paced e-learning courses at no cost through two the SAS Skill Builder for Students and SAS Academic Programs for Educators respectively. Prior to the start of classes, students are encouraged to take the course SAS Programming 1: Essentials.

Certifications

Students are highly encouraged to pursue the following SAS certifications whose topics match closely the material that taught in the SAS labs.

1. Programming Associate , Base Programming Specialist
2. Statistical Business Analyst
3. Machine Learning Specialist, Visual Statistics 8.4 on SAS Viya

The certification exams can be taken at any time online or can be hosted and proctored on AUEB's campus.