SYLLABUS 2025-2026

Statistics 2

MODULE SPECIFICATION

Module Code	2526_ECO_1_EN_009
Campus	Oxford
Department(s)	Territorial Economy and Sustainable Development
Level / Semester	Undergraduate Year 2 (U2); Equivalent to FHEQ level 5 Semester 04
Language of Instruction	English
Teaching Method	☒ In-person (face-to-face) ☐ Distance learning (live online) ☐ e-Learning (asynchronous) ☐ Hybrid: _____
Pre-requisite(s)?	Statistics (U1, S2)
ECTS *Reminder: 1 ECTS = between 20 and 30hr- student workload*	4
Equivalent FHEQ credits	8
Study Hours	80 hours which comprise of 30 directed learning and 50 independent learning/assessment hours

MODULE DESCRIPTION

Module Aims	This module builds students' ability to apply statistical techniques using Excel and SPSS to support data-driven decision-making. Students interpret data sets, perform hypothesis testing, and apply predictive methods such as regression analysis. Emphasis is on selecting appropriate tools for business problem-solving.

Teaching Arrangement	The module is delivered as lectures and applied cases studies with face-to-face discussions with students, including regular debates.
Learning Outcomes	By the end of this module, students should be able to: 1. Apply statistical techniques using Excel and SPSS to analyse data and support decision-making in management contexts. 2. Evaluate and select appropriate statistical methods to address specific business and management problems. 3. Interpret and visualise data using measures of central tendency, variability, outlier detection, and graphical representations. 4. Conduct hypothesis testing and predictive analysis using statistical techniques such as regression analysis and association tests.
Competency Goals *(Knowledge, expertise and interpersonal skills)*	PGE_U_CG05 - Innovate to adapt to its environment
	PGE_U_CG07 - Improve performance through digitalisation
Alignment with Programme Learning Goals	PGE_U_CG05_LO04 - Develop decision-making support tools
	PGE_U_CG07_LO02 - Protect data and make data-driven decisions

SESSION TOPICS / MODULE SCHEDULE

(Please note, a session/sequence may be more than one scheduled class)

Session 1: Univariate Descriptive Analysis

Content:

- Theoretical part:
  - Module introduction
  - Introduction to the notion of database
  - Brief reminders of univariate descriptive analysis
  - Calculation and interpretation exercises
- Practical cases with JASP:
  - Familiarisation of the JASP interface
  - Applications on databases

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson. (Chapters 1 & 2, pp. 25-154)
- Exercises & case studies

Session 2: Hypothesis Testing and Statistical Inference

Content:

Last reviewed: 25/07/2025

- Theoretical part:
    - Presentation of the logic of the hypothesis test and the notion of statistical significance
    - Distinction between unilateral right, unilateral left, and bilateral test
    - Conformity test of the mean
    - Proportion conformity test
- Practical cases with Excel/JASP:
    - Bilateral test
    - Unilateral right test
    - Unilateral left test
    - N > 30 (or 100)
    - N < 30

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- Read: McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson. (Chapter 7, pp. 387-447)
- Exercises

Session 3: Bivariate Analysis Between Two Variables of the Same Type

Content:

- Theoretical part:
    - Reminder on the linear correlation analysis between two quantitative variables + test of Student t or normal law z
    - Reminder on the association analysis between two qualitative variables + Chi-square independence test
- Practical cases with JASP:
    - Application on databases of association analysis between qualitative variables
    - Application on databases of the correlation analysis between quantitative variables

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- Read: McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson. (Chapter 10.3 & 10.4; Chapters 2.8 & 11.5)
- Exercises & case studies

Session 4: ANOVA

Content:

- Theoretical part:
    - Distinction between observation data and experimental data
    - Calculating averages between qualitative modalities
    - Establish the variance decomposition table

Last reviewed: 25/07/2025

- Performing the significance test of Fisher
- Practical cases with JASP:
  - Application on databases of an ANOVA with binary qualitative variable
  - Application on databases of an ANOVA with qualitative variable with several modalities

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson. (Chapter 9.1 & 9.2)
- Exercises & case studies

Session 5: Multiple Linear Regression (Part 1)

Content:

- Theoretical part:
  - Short presentation of simple linear regression
  - Conditions to be met for using multiple linear regression
  - Modelling a regression equation, defining the Y variable et selecting relevant explaining variables Xi
  - Operationalising qualitative and quantitative explaining variables
  - Interpreting regression coefficients, p-values and the determination coefficient (adjusted R^2)
- Practical cases with JASP:
  - JASP application of multiple linear regression with qualitative and quantitative explaining variables

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- Exercises & case studies

Session 6: Multiple Linear Regression (Part 2)

Content:

- Theoretical part:
  - Diagnosis of multicollinearity (correlation matrix, VIFs)
  - Diagnosis of normal distribution of residuals
  - Diagnosis of influential outliers (Student residuals, Cook's distance)
  - Distinguishing between unstandardised and standardised regression coefficients
  - Calculating predictions and assessing their accuracy
- Practical cases with JASP:
  - JASP application of the topics covered in the theoretical part

References:

- McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

Assignments:

- Read: McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson. (Chapter 14.2-14.6)
- Exercises & case studies

KEY TEXTS

1. McClave, J.T., Benson, P.G. and Sincich, T.T. (2021) *Statistics for business and economics, global edition*. 14th edn. Harlow, United Kingdom: Pearson.

SUPPLEMENTARY TEXTS

1. N/A

MODES OF ASSESSMENT

Continuous Assessment (40%)	Written exam	20%
	Group work (case study)	20%
Final Exam (60%)	Closed book written exam	

MODULE DESIGN TEAM

- Author: *Thanh Tam Nguyen Huu / Ngoc-Sang Pham*
- Reviewer: *Ambrose Egwuonwu*
- External Reviewer: *TBC*

Last reviewed: 25/07/2025