COURSE DATA

DATA SUBJECT

Code: 36517
Name: Sampling and Surveys
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1332 - Degree in Business Intelligence and Analytics	Facultat d'Economia	3	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1332 - Degree in Business Intelligence and Analytics	Herramientas y Técnicas de Análisis de Datos	COMPULSORY

COORDINATION

DIAZ BOILS JOAQUIN

SUMMARY

Study of the Sampling Theory and the basics of survey composition.
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PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

The course requieres a basic knowledge about descriptivie statistics and statistical inference. Furthermore, it is assumed that the student has some knowledge of the R statistical software.

COMPETENCES / LEARNING OUTCOMES

1332 - Degree in Business Intelligence and Analytics

Apply methods and techniques of analysis, synthesis and graphical representation by means of software tools.

Apply probability and non-probability sampling.

Be able to define, solve and present complex problems systemically.

Be able to plan, organise, monitor and evaluate the implementation of business strategies.

Be able to solve problems and to communicate and spread knowledge, skills and abilities, taking account of the ethical, egalitarian and professional responsibility of the activity of business intelligence and analytics.

Be able to use ICT, both in academia and in professional practice.

Manage and distinguish the concepts of universe, population, sample, parameters and estimators in real problems.

Plan and design a sample research.

Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.

DESCRIPTION OF CONTENTS

1. Basic Concepts

-Review of statistical concepts: population, statistical variable, sample.
-Sampling frame.
-Sampling error.
-Bias.
-Non-coverage error.

2. Random Sampling

-Sample space.
-Sampling design.
-Inclusion probabilities.
-Statistics and estimators. Unbiasedness.
-Mean square error.
-Confidence intervals.

3. General sample selection methods.

- Types of sampling.
- Hansen-Hurwitz estimator.

- Cumulative sample size selection method.
- Horvitz-Thompson estimator.

4. Simple Random Sampling (SRS)

- Estimators in SRS.
- Variances of estimators in SRS.
- Estimating the variances of estimators in SRS.
- SRS with replacement (SRSr).
- Comparison between SRS and SRSr.

5. Systematic Sampling (SS).

- Advantages and disadvantages.
- Estimators in SRS.
- Analysis of variances in SRS.

6. Stratified Sampling (SS).

- Similarities with SRS.
- The need to stratify the population.
-Estimators in an EM.
-Variances of the estimators in an EM.
-Estimation of the variances of the estimators in an EM.

7. Cluster Sampling (CMS).

-One-Stage Cluster Sampling.
-Advantages and disadvantages of CMS.
-Estimators in an CMS.
-Variances of the estimators in an CMS.
-The intracluster correlation coefficient.
-Design effect.

8. Non-Random or Pseudo-Random Sampling.

-Area Sampling Procedure.
-Random Route Sampling.
-Non-Probability Sampling. Quota Sampling.
-Convenience Sampling.
-Snowball Sampling.

9. The Survey

-Definition and Essentials
-Survey Phases
-The Survey Method

10. Questionnaire Design and Administration

-The Questions
-The Questionnaire

-Non-Response

11. Data Analysis

-Data Analysis
-Data Quality
-Report

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Computer classroom practice	30,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	50,00
Preparation of lessons	10,00
Preparation for assessment activities	20,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

Participative master class with the main objectiveof introducing the basic conceptual concepts

Practical lessons where there will be problem resolution, case estudies, application, the use of an appropriate software, oral and/or groupal presentations and other activities.

Supervised work based on the read and analyse of reports and the realization of groupal and/or individual projects
The independent student's work and the realitzation of different oral and/or written exams

EVALUATION

The subject will be assessed using the following procedure:

1. Theoretical or practical exam in which students must reason, formulate, and answer the questions posed;
2. Assessment of the practical activities carried out by the student during the course, based on problem-solving;
3. Assessment of the practical activities carried out by the student during the course, based on practical exercises with R.

The percentages given are 30%, 30%, and 40%, respectively.

REFERENCES

- MURGUI, S. (2014) Investigación por muestreo estadístico. Repro Exprés Valencia.

- FERNANDEZ, F. y MAYOR, J. (1994) Muestreo en poblaciones finitas: curso básico. PPU Barcelona

- SARNDAL, C. SWENSSON, B y WRETMAN, J. (1992) Model Assisted Survey Sampling. Springer-Verlag

- RUIZ, M. (2012) Exactitud de la inferencia en poblaciones finitas. Madrid.

- Pérez López, César. Muestreo estadístico¿: Conceptos y problemas resueltos. Madrid: Pearson, 2005. Print.