COURSE DATA

DATA SUBJECT

Code: 36433
Name: Economics and Data Science
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1406 - Degree in Data Science	Escola Tècnica Superior d'Enginyeria	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1406 - Degree in Data Science	Economics, Business and Management	COMPULSORY

COORDINATION

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SUMMARY

Economics and Data Science is a compulsory course, which is taught during the first semester of the fourth year of the Degree in Data Science. It is assigned to the Areas of Economic Analysis and Economic Structure and consists of a total of 6 ECTS credits.

To respond to the requirements of the Degree, the proposed program provides the student with the necessary knowledge about basic principles of economics, both from the microeconomic and macroeconomic fields. Also, this course will connect these theoretical concepts with the empirical reality through practical examples based on data management.

At the end of the course, students will be able to discuss economic phenomena applying the knowledge acquired during the course, read economic literature and follow current economic debates. Students will also learn about the main databases used in economics, and about data science applications in economics based on real problems. In addition, they will be able to autonomously apply data analysis techniques to respond to problems in the field of economics.

Theory classes will be taught in Spanish while practical and laboratory classes will be taught according to

what is specified in the course information available at the degree website.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Statistical inference, Linear models.

COMPETENCES / LEARNING OUTCOMES

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(CB5) Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

(CE12) Ability to design and start solutions based on data analysis in the field of medicine and business, taking into account the specific requirements of this type of use cases.

(CG03) Capability to elaborate models, calculations, reports, to plan tasks and other works analogous to the specific field of data science.

DESCRIPTION OF CONTENTS

1. Economic growth and convergence

-GDP and its components
-Neoclassical growth model
-Convergence
-Applications of data science to problems of growth and convergence
-Case study in the laboratory

2. Growth determinants, imbalances and economic policy

-Determinants of economic growth: R&D, physical and human capital, institutional quality
-Agglomeration economies and tools for analysis
-Applications of data science to problems of determinants of economic growth
-Case study in the laboratory

3. Inequality and social progress

-Indicators of inequality
-Limitations of GDP
-Composite indicators of social progress
-Applications of data science to problems of inequality and social progress
-Case study in the laboratory

4. Evaluation of programs with econometric techniques

- Causal inference and policy evaluation.
- Estimation by instrumental variables.
- The discontinuity regression design.
- Difference in differences and synthetic controls.

5. Markets and data science

- Market structure: supply, demand and competition.
- Problems: identification, endogeneity and causality.
- Estimation methods.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Laboratory	20,00
Classroom practices	10,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	20,00
Independent study and work	20,00
Preparation of lessons	25,00
Preparation for assessment activities	15,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

The theoretical classes will be developed, basically, through lectures. However, the active participation of the student in the classes will be encouraged and valued very positively. For the study of the contents of the subject, students must use, in addition to the teacher's explanations, the bibliography recommended in the analytical program. (CG03, CB5)

Complementary materials will be offered through the virtual classroom. These can be videos, press, conferences or current websites related to the subject to be explained and about which students can be asked throughout the class. (CG03, CB5)

The problem and laboratory classes are aimed at the consolidation and practical application of the techniques and tools introduced in the theory, through the resolution of cases, or the realization of teamwork in different formats, using various teaching methodologies. For a correct use of them, students must organize themselves into teams and solve the cases or exercises that will be raised throughout the course, and then discuss the solutions in the classroom. (CG03, CB5, CE12)

In particular, in the laboratories a problem related to the theory will be raised and the student will have to carry out the complete process of data collection, analysis of the same, extraction of conclusions and presentation of a report (CG03, CB5, CE12)

EVALUATION

Theory - Synthesis test S1 (70% of the final mark). This test can combine both objective tests (test) and restricted test tests. In any case, the questions can refer to both theoretical and practical content. Preferably, questions will be formulated that require the student to relate various concepts of the subject. (CG03, CB5, CE12)

It will be necessary to obtain four points out of ten in the written test to be able to add the continuous evaluation of practices that is proposed below.

Laboratory S2 (CG03, CB05, CE12) - Continuous assessment (30% of the final grade). The teacher, throughout the course, will ask students to deliver practical cases and / or carry out partial tests to evaluate them, which will be carried out individually and / or in groups. These activities have only academic sense where they are raised, and are then non-recoverable.

In any case, the evaluation system will be governed by what is established in the Evaluation and Qualification Regulations of the University of Valencia for Degrees and Masters.
(https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion = start & idEdictoSelected = 5639)

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

REFERENCES

- La Economía https://www.core-econ.org/the-economy/es/
- Barro, R. & Sala-i-Martín, X. (2009). Crecimiento Económico. Editorial Reverté, Barcelona
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- Aghion, P. & Durlauf, S. (2005). Handbook of Economic Growth, Volume 1, North-Holland.
- Fehder, D., Porter, M., Stern, S. Economic Institutions and social progress. (2019). American Economic Association Papers and Proceedings, 109, 350-356.
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- Angrist, J.D. & Pischke, J.S. (2016) Dominar la econometría: el camino que va de la causa al efecto. Antoni Bosch editor.
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- Abadie, A. & Cattaneo, M. D. (2018) Econometric Methods for Program Evaluation, Annual Review of Economics 10(1), 465-503.