UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Data Analysis and Tax Compliance

2526-2-F551MI048

Learning objectives

1. Knowledge and Understanding
   By the end of the course, students will have acquired a solid understanding of the main statistical techniques used both nationally and internationally to estimate tax risk and control tax evasion. The course will cover classification and regression models, group analysis segmentation models, and will also reference modern machine learning models, discussing their pros and cons. Additionally, the course will explore AI tools used by tax authorities at various stages of the tax procedure, emphasizing the need to balance the general interest of raising revenue with the protection of taxpayers' rights.

2. Applying Knowledge and Understanding
   Students will be able to apply the statistical models studied to analyze tax risk and detect potential cases of tax evasion. They will also learn how to interpret statistical outputs resulting from the application of complex models, converting them into actionable insights for tax assessments. A thorough understanding of the legal requirements for tax assessment methods and tax compliance procedures will enable students to use these analytical tools effectively.

3. Making Judgements
   Students will develop the ability to critically evaluate the reliability and appropriateness of various statistical models and algorithms used in automated tax decision-making. They will be able to identify risks related to potential biases or misuse of AI technologies, proposing improvements that consider the balance between public interest in revenue collection and the protection of taxpayers' rights.

4. Communication Skills
   Students will be able to clearly and effectively communicate the results of statistical analyses and critical evaluations, both to technical and non-technical audiences. They will be capable of presenting the legal and operational implications of using automated tools in the tax context, with particular focus on transparency and accountability in decision-making.

5. Learning Skills

The course will foster an analytical and interdisciplinary mindset, encouraging students to independently study new statistical techniques and keep up-to-date with the evolving legal and technological landscape in tax matters. Students will be encouraged to continue their learning in a critical and reflective manner, preparing them for professional contexts or research in the field.

Contents

Data analaysis and tax compliance.
(see https://www.unimi.it/en/education/degree-programme-courses/2025/data-analysis-and-tax-compliance)

Detailed program

First Part (Prof. Sartori)

- The reasons and importance of tax law: an introduction and a definition of direct and indirect taxes;
- Introduction to income and consumption taxes;
- Tax evasion, tax avoidance and legitimate tax savings;
- Presumptive income taxation;
- Tax compliance and AI tax assistance;
- Tax audits and traditional methods of addressing tax evasion and avoidance;
- Tax audits and the use of artificial intelligence;
- Taxpayers rights in tax audits.
- Tax control framework and cooperative compliance;
- Analytical (or direct) tax assessments: a legal perspective;
- Indirect and standardized tax assessments: a legal perspective;
- The use of artificial intelligence in tax assessments

Second Part (Prof Salini)

- Introduction to inferential statistics, estimation theory, confidence intervals and hypothesis testing.
- Main supervised and unsupervised statistical learning techniques used in fiscal risk estimation (regression, classificazion, clustering, etc.).
- Focus on interpretive and predictive approaches, explainable and non-explainable methods.

Prerequisites

There are no special prerequisites for the first part.
For the second part, it is suggested to have already taken the Machine Learning course.

Teaching methods

Mainly lectures will be given. Case studies and practical exercises are also planned.

Assessment methods

The examination consists of an oral test for the first part and an oral test for the second part. The final grade will be the average of the marks for the two parts.

Textbooks and Reading Materials

Materials (slides, papers, datasets, examples) in the ARIEL website.

Second Part
James, et al. An introduction to statistical learning: with applications in R. Spinger, 2013.
James, et al. An introduction to statistical learning: with applications in python. Springer, 2023.

Sustainable Development Goals

PEACE, JUSTICE AND STRONG INSTITUTIONS