

Syllabus

Course Description

Course Title	Introduction to Data Management and Data Analysis
Course Code	27601
Course Title Additional	
Scientific-Disciplinary Sector	STAT-01/A
Language	English
Degree Course	Master in Public Policy and Innovative Governance
Other Degree Courses (Loaned)	
Lecturers	Dott. Mag. Andrea Molinari, Andrea.Molinari@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/3420 dr. Tun-I Hu, TunI.Hu@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/48974
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	8
Teaching Hours	48 (Molinari)
Lab Hours	6 (Hu)
Individual Study Hours	
Planned Office Hours	24 (Molinari)
Contents Summary	This course provides students with applied data analysis skills relevant to the public sector, with a focus on the informed use of computational tools rather than software development. Students are introduced to data extraction and database querying using SQL, at both a conceptual and practical level. The course also covers the theoretical foundations of relational databases, including relational algebra, Cartesian products, and relational operations,

	with an emphasis on their practical application in SQL. Particular attention is given to real-world data sources, including administrative and public sector data, in order to contextualize data extraction within digital public environments. By the end of the course, students will be able to extract and analyze data from relational databases, both from public and private sources, and use it effectively to support data-driven communication in a public policy context.
Course Topics	1. Data Management Fundamentals, 2. Data modeling - the relational model, 3. Data handling using SQL 4. Selection queries 5. Join operations 6. Aggregation queries 7. Set operations in SQL 8. Subqueries 9. Outer Joins
Keywords	Data Management, Data Modeling, SQL language, extracting data with SQL from datasource
Recommended Prerequisites	B1 level in English is required to sit the exam. Basic computer science background
Propaedeutic Courses	
Teaching Format	Lectures and exercises
Mandatory Attendance	Attendance is recommended, but not mandatory.
Specific Educational Objectives and Learning Outcomes	ILO (Intended Learning Outcomes) Introduction to Data Management and Data Analysis ILO1 Knowledge and understanding ILO1.2 The student acquires knowledge of economic theory necessary to understand and analyse economic and business phenomena in the public sector in order to support decision-making processes. Knowledge of public policy and the tools necessary for the design of sustainable policies will be consolidated. Knowledge related to the labour market, education and health will also be deepened, functional to the development of public policy analysis and evaluation skills. ILO2 Ability to apply knowledge and understanding ILO2.4 ability to interpret results deriving from statistical and econometric analysis in contexts of interest to companies and public bodies

	ILO3 Making judgements ILO3.1 ability to apply acquired knowledge to interpret economic and business phenomena in order to make managerial and operational decisions in the context of public administration ILO3.2 ability to select data and use appropriate information to describe a problem concerning the design, implementation and evaluation of public sector projects and policies, aiming at innovation and improvement of processes, products and results ILO3.3 ability to relate models and empirical evidence in the study of public policy phenomena ILO4 Communication skills ILO4.1 ability to communicate effectively in oral and written form the specialised contents of the individual disciplines, using different registers according to recipients and communicative and didactic purposes, as well as to evaluate the formative effects of his/her communication ILO5 Learning ability ILO5.1 ability to use information technology autonomously to carry out bibliographical research and investigations and for one's own training and further education.
Specific Educational Objectives and Learning Outcomes (additional info.)	Knowledge and understanding of different types of data and their representation. Management of complex data structure for knowledge representation
Assessment	Written exam with questions of data extraction from relational datasources, and interpretation of results. Obligatory written final exam (ILOs 1-5). The final grade (100%) will be a weighted average of the various questions considering their complexity and length.
Evaluation Criteria	Criteria for the exam: correctness and clarity of answers, knowledge and understanding of data representation, ability to interpret requests and represent them into a proper SQL query, selecting the most effective and efficient one. Students will be evaluated on their understanding and ability to apply data management query techniques; knowledge and

	understanding of data representation; ability to interpret requests and transform them in proper queries.
Required Readings	Lecture notes. Additional materials and references will be provided by the lectures throughout the course.
Supplementary Readings	
Further Information	Co-lecturer to be appointed.
Sustainable Development Goals (SDGs)	Quality education