UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

DIPARTIMENTO DI SCIENZE POLITICHE

OURSE OF STUDY: Political, Economic and Administrative Science (L-16)

ACADEMIC YEAR: 2023/2024

ACADEMIC SUBJECT: Elements of Statistics and Demography

Year of the course	II
Academic calendar (starting and ending date)	I semester (September 18 – December 07)
Credits (CFU/ETCS):	8
SSD	SECS-S/04
Language	Italian
Mode of Attendance	Attendance, while not compulsory, is highly recommended

Professor/ Lecturer	
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Department and address	Departiment DIRIUM
Virtual headquarters	Teams or in presence (please send e.mail before)
Tutoring (time and day)	Thursday: 8,30-10,30 in attendance or on Teams

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
200	60	4	136
ECTS			
8			

Syllabus	
Learning Objectives	Students will be able to apply the knowledge and understanding acquired during teaching activities through the simulation of concrete situations and case studies. This will allow students to develop skills regarding the measurement, observation and processing of statistical and demographic data, and the application of useful concepts and methods to design and carry statistical surveys capable of producing information on social phenomena and social behaviours. These objectives will be pursued by accompanying lectures and exercises with reports and oral presentations carried out individually and/or in groups during lessons. Students will be guided to develop skills to build critical evaluations, by applying the theoretical knowledge acquired, on information provided during the course regarding methods, data elaborations, and interpretations. This will allow students to acquire the ability to collect and analyze data, to make autonomous judgments and coherent reflections on topics addressed during lessons, with special regard to the observation and management of relevant populations -from a statistical-demographic perspective- and to the decision-making-processes of public and private interest.

Course prerequisites	Basic knowledge (at high school level) of arithmetic, algebra, and geometry.
Contents	**Course program** 1. Data collection and classification. Survey design. Sample surveys. Data collection. Intensity, categories, and frequencies. Various types of variables. 2. Statistical observation. Quantitative and qualitative variables. Time series and territorial series. Two way and multiple variables. 3. Graphical representations of data. Purpose of graphical representations. Cartesian diagrams. Orthograms and histograms. The area method. The polar diagram. The cartograms. 4. Mean values (mode, median, quantiles, arithmetic, harmonic, geometric, quadratic mean). Mean Properties. 5. Variability measures (range, interquartile range, deviance, variance, standard deviation, coefficient of variability, Gini's ratio). 6. Normal distribution. The standard normal curve. Asymmetry. Abnormality. 7. Regression and correlation. Dependent, independent, and interdependent characters. Regression lines. Linear correlation coefficient. Regression variance. Quadratic connection index. 8. What is demography for? The current emerging demography. 9. Individuals, generations, population. Definition of population. Individuals and their biographies. Time and duration. The Lexis Diagram. Stories of generations and state of the population. Generations and contemporaries. 10. Size and structure of a population. Age and sex composition of populations. A social challenge: demographic ageing. Data sources. 11. The processes of renewal and extinction of generations. The formation of generations. Intensity, timing and composition of the offspring. Mortality and average life length. Population longevity and individual endurance. Reproduction measures and replacement fertility. Contemporaries and generations. 12. The demographic situation and the long-term projections. Stock and population changes. The demographic balance sheet and its components. Population growth and measures. The demographic transition. Forecasts. 13. The family and its transformations. The family as a system of relationships. Long-term transformations. Family structures in western societies today. The family in ISTAT surveys. 14. Beyond demography: from description to interpretation. Knowledge of demographic phenomena. Mortality determinants. Fertility determinants. Migration determinants.
Books and bibliography	G. GIRONE, C. CROCETTA, A. MASSARI, Statistica, Cacucci Editore, Bari, 2019 G.C. BLANGIARDO, Elementi di Demografia, Il Mulino, 2009 (Capitoli 1, 2)
Additional materials	For the exercises: Notes provided by the professor.

Teaching strategy	Lezioni frontali con ausilio di slides (PPT)
Expected learning outcomes	
Knowledge and understanding on:	As part of the expected learning outcomes, students will acquire knowledge and understanding about both the theory and practice of statistical and demographic methodologies. In particular, the course aims to train students to develop the skills necessary for the collection of quantitative and qualitative information, for

	data processing, for the selection and application of statistical and demographic methods, and for the representation and interpretation of collective phenomena in different contexts, including socio-demographic and economic ones. In addition, students will acquire skills regarding both the comparative analysis of variables appertaining to the same or different statistical populations, and the analysis of the characteristics of populations and demographic processes. The educational objectives of this course will be pursued through lectures and exercises carried out during lessons, as well as through seminars on topics of specific interest.
Applying knowledge and understanding on:	Students will be able to apply the knowledge and understanding acquired during teaching activities through the simulation of concrete situations and case studies. This will allow students to develop skills regarding the measurement, observation and processing of statistical and demographic data, and the application of useful concepts and methods to design and carry statistical surveys capable of producing information on social phenomena and social behaviours. These objectives will be pursued by accompanying lectures and exercises with reports and oral presentations carried out individually and/or in groups during lessons.
Soft skills	Considering that topics taught follow a subsequent structure, during lessons and exercises, students will be repeatedly urged to verify their knowledge, and called to fill cognitive gaps and expand the skills already acquired. This will allow students to improve their learning skills, through individual and/or group activities, and their method of study by using a theoretical-practical learning approach, that is, the process of learning by doing. The learning capacity will be evaluated through several forms of continuous evaluation during the course, also carrying out some data elaborations and research-related analysis.

Assessment and feedback	
Assessment methods	Written test and oral interview
Assessment criteria	Problem-solving skills: i.e. applying what has been learnt to a real situation, identifying the areas of knowledge that allow it to be tackled most effectively. Attending students will apply statistical methodologies to the study of social phenomena and provide a critical interpretation of the results obtained through statistical survey. Analysing and synthesising information: i.e. acquiring, organising and reformulating data and knowledge from different sources. Exercises based on official statistics will be carried out, which will help to develop the ability to analyse and compare statistical data. Making independent judgments: i.e. interpreting information critically and making decisions accordingly. Students will have to indicate how to choose between alternative statistical methods for the collection, representation, processing and synthesis of statistical data. Efficient communication: i.e. conveying information and ideas in both oral and written form in a clear and formally correct manner, expressing them in terms appropriate to the interlocutors, specialists or non-specialists in the field. Students expound on statistical methods used in the collection, processing and interpretation of data concerning social phenomena and indicate measures of growth and structural characteristics of populations. Continuous learning: i.e. knowing how to recognise one's own shortcomings and how to identify effective strategies for acquiring new knowledge and skills. During the course of the exercises, students will be asked to point out the statistical tools (indices, ratios, graphs, tables) that enable them to critically analyse the data.

	Working in a team: i.e. coordinating with other people, even those with different cultures and professional specialisations, integrating skills. Attending students will be asked to form working groups during the exercises. Being enterprising: i.e. being able to develop innovative ideas, to plan and organise their implementation, to manage the necessary means and to be willing to take risks in order to do so. Students are expected to identify appropriate statistical techniques for data processing and synthesis. Ability to organise and plan: i.e. to realise ideas and projects taking into account time and other available resources. Attending students are expected to carry out exercises and case application activities within the time allocated for the course.
Final exam and grading criteria	Evaluation is by means of an oral final examination with a grade expressed in thirtieths (from 18/30 to 30/30). In order to qualify for a high mark in the examination, it is necessary to have developed a critical autonomy of judgement and an adequate capacity for arguments and exposition. The criteria followed for the evaluation of learning outcomes expressed in thirtieths are: Insufficient: 0-17 Lacking, incomplete and inadequate knowledge of the topics contained in the program, inadequate exposition and argumentation skills, also with reference to the technical and conceptual lexicon of the discipline by the candidates, insufficient processing skills and autonomy of judgment. Sufficient: 18-20 Sufficient knowledge of the topics contained in the program, overall adequacy of the methods of expression and argumentation, also with reference to the technical and conceptual lexicon of the discipline, elementary processing skills and autonomy of judgment. Fair: 21-23 Discrete knowledge of the topics contained in the program, appreciable ability to use modes of expression appropriate to the technical and conceptual lexicon of the discipline, discrete ability to argue, elaborate and connect between the various topics. Good: 24-26 Good knowledge of the topics contained in the program, good in-depth skills and autonomy of judgment, verifiable also through the use of methods of expression decidedly appropriate to the technical and conceptual lexicon of the discipline. Very good: 27-28 More than good knowledge of all the topics contained in the program, ability to deepen, connection between the different topics, critical autonomy and very good judgment and mastery of the methods of expression of the technical and conceptual lexicon of the discipline. Great: 29-30 Great knowledge of all the topics contained in the program, great ability to deepen, link between the different topics, as well as critical autonomy and in-depth mastery of the methods of expression of the technical and conceptual lexicon of the discipline. Excellent: 30L Excellent knowledge of all the topics contained in the program, excellent ability to deepen, link between the different topics, as well as critical autonomy and complete mastery of the methods of expression of the technical and conceptual lexicon of the discipline.
Additional information	