

COURSE OF STUDY: Political Science L-36

ACADEMIC YEAR: 2024-25

ACADEMIC SUBJECT: Elements of Statistics and Demography

General information	
Year of the course	Second
Academic calendar (starting and ending date)	16 th September – 13 th December 2024 (I semester)
Credits (CFU/ETCS):	10
SSD	(SECS-S/04) Elements of Statistics and Demography
Language	Italian
Mode of attendance	Attendance is highly recommended

Professor/ Lecturer	
Name and Surname	Michela Camilla Pellicani
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Department and address	Department of Political Science Piazza C. Battisti, 1 (VI floor) – 70121 – Bari
Virtual room	Microsoft Teams platform
Office Hours (and modalities: e.g., by appointment, online, etc.)	To be established depending on the lecturing schedule. See the page dedicated to Prof. Pellicani on the Department website: https://www.uniba.it/it/docenti/pellicani-michela-camilla/attivita-didattica/didattica-michela-camilla-pellicani Tutorship activities for student will be organised by appointment via email. They will be available online on student' demand.

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
250	80		170
CFU/ETCS			
10	10		

Learning Objectives	<p>The main educational objective of the course is to offer students the necessary tools for understanding the fundamental topics of methodological statistics and demographics in order to develop the ability to conduct quantitative analyses relating to essential features of contemporary society.</p> <p>In particular, descriptive statistics and the study of the three variables that contribute to population change will be studied: mortality, fertility and migration. Theories of population development will be studied as well.</p>
Course prerequisites	Basic mathematical and analytical knowledge acquired in higher education.

Teaching strategies	<p>Students will be guided in the organisation and planning of their study activities.</p> <p>Students will also be invited to prepare for the final exam by working in small groups in order to improve their communication skills and increase their exposure.</p>
Expected learning outcomes in terms of:	
Knowledge and understanding	<p>The course aims to provide theoretical and practical tools in terms of survey design and data analysis for both descriptive/interpretative research and the study of decision-making including developments in theory and application.</p> <p>Demography deals, in particular, with the analysis, interpretation and prediction of the structural and evolutionary characteristics of human populations by studying their interactions with economic, sociocultural, anthropological, historical, political and biological processes.</p> <p>Furthermore, the study on population behaviour, the analysis of demographic data and population-based theories assume specific importance.</p> <p>Through the application of quantitative methods learned during the course and involving concepts and tools of other disciplines in an interdisciplinary perspective, students will be able to analyse socioeconomic development and population trends.</p>
Applying knowledge and understanding	<p>Students will learn to collect, organise, analyse, and interpret mainly quantitative data.</p> <p>Students will develop, as well, a critical analysis of data skill coming from multiple sources, either specialised or mass media.</p>
Soft skills	<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> <p>The course also aims to ensure that students develop a critical analysis of data coming from multiple sources, either specialised or mass media.</p> <ul style="list-style-type: none"> • <i>Communicating knowledge and understanding</i> <p>Using appropriate terminology of the related disciplines, students will be able to clearly present the concepts learned in the course.</p> <ul style="list-style-type: none"> • <i>Capacities to continue learning</i>

	Students with regular attendance will be offered the opportunity to fill gaps and correct their mistakes during the course. Students are invited to actively participate in classroom.
Syllabus	
Content knowledge	<p>Course program:</p> <p>A1 – Introduction</p> <ol style="list-style-type: none"> 1. Topics of statistics and demography: purposes, definitions, fields in which statistics and demography are applied. 2. The collection and classification of data: statistical and demographic sources. Census surveys, partial surveys, and sample surveys. Sampling techniques. Investigation techniques and tools. Status and flow data. Intensity, modality, and frequencies. <p>A2 - Descriptive statistics tools for single variable.</p> <ol style="list-style-type: none"> 3. Frequency distribution, quantitative and qualitative variables, relative frequency and percentage frequency, cumulative frequency, frequency density. 4. Graphical representations: the Cartesian graph and the histogram. The spatial method for representing qualitative variable. The polar diagram. The cartograms. 5. Average values. The properties of the arithmetic mean. Median, mode and quartiles. 6. Variability: Indexes of absolute and relative variability. 7. Mutability: Entropy index. 8. Index numbers; Percentage variation; Average annual rate of change. <p>A3 - Descriptive statistics tools for bivariate analysis</p> <ol style="list-style-type: none"> 9. Independence, dependency, and interdependency. 10. Regression and correlation: distributions in two or more variables. Scatter diagram. Regression line. Least squares method. Goodness of fit test. Regression variance. Concordance and discordance. Correlation coefficient. <p>A4 - Tools for statistical inference</p> <ol style="list-style-type: none"> 11. From description to inference. Chance and probability. Random Variables: Continuous, Normal and Binomial. Defining and measuring asymmetry and disnormality. Random variable. Standardized normal. Typical intervals of the normal curve. <p>A5 - Elements of demographic analysis</p> <ol style="list-style-type: none"> 12. Definitions and working tools: Lexis diagram. Cohorts and generations. The various types of analysis. Probabilities and rates. Generic rates and specific rates. 13. The structural characteristics of the population: some indexes of structure. The population pyramid. 14. Mortality: the mortality rate. Direct and indirect standardization. Mortality in relation to sex and age. The Mortality table. Biometric functions and their trend with respect to age. Mortality tables by causes. Lengthening of the average life. 15. Infant mortality: general information and measure of infant mortality. The endogenous and exogenous components. Stillbirth and perinatal mortality.

	<p>16. Fertility: Birth and fertility rates. Sex ratio at birth. Total fertility rate. Intrinsic rate of population increase. Decline in fertility rates. Population ageing.</p> <p>17. Migration: migration rates and net migration. Internal and international migrations. Detection and quantification of international migrations. The migratory phenomenon in Italy.</p> <p>18. Population development theories: The Malthusian theory. The logistic curve theory. The demographic transition. The II demographic transition.</p> <p>19. Stable and the stationary populations.</p> <p>Teaching methods: Students will be guided in the organisation and planning of their study activities.</p> <p>Students will also be invited to prepare for the final exam by working in small groups in order to improve their communication skills and increase their exposure.</p>
Texts and readings	<p>In specialised book shops there are various manuals on both Statistics and Demography.</p> <p>However, suggested manuals and exercises are:</p> <ul style="list-style-type: none"> - Statistica, G. Girone, Cacucci ed.; or Statistica, G. Girone, C. Crocetta, A. Massari (2019), Cacucci ed.; - Esercizi di Statistica Descrittiva, (2018), P. Iaquina – D. Viola, L’Arco e la Corte ed.; - Appunti di Demografia, (2020), P. Iaquina, L’Arco e la Corte ed.
Notes, additional materials	<p>Any supplementary material will be made available during the course on the dedicated Teams page.</p>
Repository	<p>The reference texts are available at the department library.</p> <p>For information, consult the following link: https://www.uniba.it/it/ricerca/dipartimenti/scienze-politiche/biblioteca/biblioteche-1/servizi-offerti</p>

Assessment	
Assessment methods	<p>The methods for assessing skills and preparation are as follows:</p> <ul style="list-style-type: none"> - case analysis; - active participation to laboratories during the course; - carrying out group activities; - active participation to seminars; - written intermediate tests (whose marks will contribute to the definition of the final mark); - oral and written final exam.
Assessment criteria	<p>The knowledge and ability to understand the different teaching contents will be assessed by asking the students to expose the acquired skills also in a comparative perspective.</p> <p>The applied knowledge and understanding will be assessed through the request</p>

	<p>to identify and use the different theoretical and applicative approaches illustrated during the course to the study of socio-economic and demographic phenomena, the relationships between them and related problems.</p> <p>Judgment independence will be verified through the students' demonstration of the acquisition of reasoning and critical processing skills on specific topics.</p> <p>The verification of the acquisition of communication skills will take place through the assessment of the presentation and argumentation skills shown by the students.</p> <p>The learning ability will be assessed by requesting the application of statistical and demographic analysis techniques to case studies.</p>
<p>Final exam and grading criteria</p>	<p>The final grade is expressed out of thirty.</p> <p>Insufficient: 0-17</p> <p>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.</p> <p>Sufficient: 18-20</p> <p>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.</p> <p>Fair: 21-23</p> <p>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.</p> <p>Good: 24-26</p> <p>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.</p> <p>Very good: 27-29</p> <p>In-depth knowledge of all the topics contained in the program, great ability to deepen, link between the different topics, as well as critical autonomy and very good mastery of the methods of expression of the technical and conceptual terminology of the discipline.</p> <p>Excellent: 30-30L</p> <p>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.</p>
<p>Further information</p>	