

Academic subject: Elements of Statistics and Demography			
Degree Class: Bachelor's Degree		Degree Course: Political Science	Academic Year: 2021/2022
		Kind of class: mandatory	Year: 2nd
			Period: 1st
			ECTS: divided into ECTS lessons: 7 ECTS exe/lab/tutor: 3
Time management, hours, in-class study hours, out-of-class study hours lesson: 80 exe/lab/tutor: in-class study: out-of-class study: 170			
Language: Italian	Compulsory Attendance: No		
Subject Teacher: Prof. Michela C. Pellicani	Tel: 080.5717107 e-mail: michelacamilla.pellicani@uniba.it	Office: Department of Political Science Floor VI – Piazza C. Battisti, 1	Office days and hours:
Prerequisites: Basic mathematical and analytical knowledge acquired in higher education.			
Educational objectives: 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. 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.			
Expected learning outcomes (according to Dublin Descriptors)	<p>Knowledge and understanding: 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> <p>Applying knowledge and understanding: Students will learn to collect, organise, analyse, and interpret mainly quantitative data.</p> <p>Making judgements: The course also aims to ensure that students develop a critical analysis of data coming from multiple sources, either specialized or mass media.</p> <p>Communication: Using appropriate terminology of the related disciplines, students will be able to clearly present the concepts learned in the course.</p> <p>Lifelong learning skills: 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.</p>		

As well students will develop a critical analysis of data coming from multiple sources, either specialized or mass media.

Course program:

A1 - Introduction

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.

A2 - Descriptive statistics tools for single variable.

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.

A3 - Descriptive statistics tools for bivariate analysis

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.

A4 - Tools for statistical inference

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.

A5 - Elements of demographic analysis

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.
16. Fertility: Birth and fertility rates. Sex ratio at birth. Total fertility rate. Intrinsic rate of population increase. Decline in fertility rates. Population ageing.
17. Migration: migration rates and net migration. Internal and international migrations. Detection and quantification of international migrations. The migratory phenomenon in Italy.
18. Population development theories: The Malthusian theory. The logistic curve theory. The demographic transition. The II demographic transition.
19. Stable and the stationary populations.

Teaching methods: Students will be guided in the organisation and planning of their study activities. 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.

Auxiliary teaching:

Mentorship and tutorship activities

Assessment methods: The methods for assessing skills and preparation are as follows:

- case analysis;
- presentation of reports during the course;
- carrying out group activities;
- active participation in seminars;
- compulsory written intermediate tests (whose marks will contribute to the definition of the final mark);
- oral and written final exam.

The final grade is expressed out of thirty.

Bibliography: In specialised libraries there are various manuals on both Statistics and Demography. However, manuals and exercises are preferably to be defined with the teacher.