



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Economiche, Aziendali e Statistiche
<b>ACADEMIC YEAR</b>	2019/2020
<b>MASTER'S DEGREE (MSC)</b>	STATISTICS AND DATA SCIENCE
<b>SUBJECT</b>	SAMPLING PLANS FOR SOCIAL SCIENCES
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	B
<b>AMBIT</b>	50607-Statistico applicato
<b>CODE</b>	15511
<b>SCIENTIFIC SECTOR(S)</b>	SECS-S/05
<b>HEAD PROFESSOR(S)</b>	GIAMBALVO ORNELLA Professore Ordinario Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	9
<b>INDIVIDUAL STUDY (Hrs)</b>	162
<b>COURSE ACTIVITY (Hrs)</b>	63
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	
<b>YEAR</b>	1
<b>TERM (SEMESTER)</b>	2° semester
<b>ATTENDANCE</b>	Not mandatory
<b>EVALUATION</b>	Out of 30
<b>TEACHER OFFICE HOURS</b>	<b>GIAMBALVO ORNELLA</b> Tuesday 10:00 12:00 Il servizio prenotazione ricevimento e sospeso. Per fissare un appuntamento con la docente si prega di inviare una mail all'indirizzo ornella.giambalvo@unipa.it Wednesday 12:00 13:00 Il servizio prenotazione ricevimento e sospeso. Per fissare un appuntamento con la docente si prega di inviare una mail all'indirizzo ornella.giambalvo@unipa.it

<p><b>PREREQUISITES</b></p>	<p>A basic knowledge of the Inference and of simple sampling techniques needed.</p>
<p><b>LEARNING OUTCOMES</b></p>	<p>Knowledge and understanding:  <ul style="list-style-type: none"> <li>• have demonstrated knowledge and the specific language used for understanding the complex sampling techniques for finite populations.</li> </ul>           Students easily achieve these results through participation in lectures and by consulting the reference books.</p> <p>Applying knowledge and understanding:  <ul style="list-style-type: none"> <li>• can apply their knowledge and understanding, and problem solving abilities in individuating the scaling of available data; understanding the application field of the complex sampling techniques; using in a coherent way the sampling techniques studied, interpreting the results with competence and knowledge related to their field of study. Skills are acquired through a work of individual and collegial exercise class coordinated by the Teacher.</li> </ul> </p> <p>Making judgements:  <ul style="list-style-type: none"> <li>• have the ability to integrate knowledge and handle complexity, and formulate critical judgements with incomplete or limited information of the obtained results. This will be used in each step of the learning process by also following a critical approach to the provided stimuli.</li> </ul> </p> <p>Communication:  <ul style="list-style-type: none"> <li>• can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and nonspecialist audiences clearly and unambiguously;</li> </ul>           can consult the referred and specialist bibliography in national and international field. The aim is to give the student the ability of adapting his/her speech (also in writing) to the spokesperson, usually a not-statistician.            The habit of speech and the exchange of information should take place by forcing the use of correct forms of communication, during exercise class.</p> <p>Learning skills            Students are constantly encouraged to acquire a critical view on issues such as to allow the passage from theoretical preparation to empirical application of the same in a more autonomous as possible.            Students will be able to understand the scientific literature; to increase their knowledge attending higher-level courses and/or on their own; to adapt their knowledge to different contexts and interlocutors.            The dialectic confrontation with classmates and with the teacher will be used for the expansion of this skill.</p>
<p><b>ASSESSMENT METHODS</b></p>	<p>Student's assessment is done through a written and one oral exam. The oral exam is subject to passing the written test (its outcome will be considered for the final mark). The exam will be conducted by the chair of the course, and at least one among teachers/PhDs with knowledge in similar study field and people who was designated as expert by the Degree Course Committee.</p> <p>Test            The test aims to check student's knowledge, abilities (with respect to excel too) and his/her talent in reporting them in a text along with an adequate statistical language.            The test lasts 2 hours. During the written test cellular phones, smartphones, and own notebook/tablet will not allowed, under penalty of invalidation of the exam. Student can withdraw from the exam (oral and written) at any time.            If the student does not pass the exam, he/she can do it again at next scheduled exam.            The test considers three questions: the first, aims to assess the putting in field when the students must organize a sampling plan, The second exercise concerns the use of methods and formulas to estimate a parameter, the variance of the estimator and his def. The third exercise is a test of 3 multiple choice questions (True/False) in which a discussion of the given answers is required.            The pass-mark (expressed by a mark of 18 on a 0-30 scale) will be reached when the student will show a basic use of the core concepts/terms of the module, and when he chooses the suitable methodology even in case of some calculus errors, provided for of any coherence with the theoretical question.            Is the student solves only the second exercise the written test passes.</p> <p>Oral exam            Once the student passes the written test, he/she will access to the oral exam. Oral exam regards both course modules and it will examine in depth the test and further student's knowledge.            Oral exam consists of at least 2 questions aimed to better graduate the assessment of the student's knowledge and abilities (also to made links to others subjects) and his/her talent in reporting them by a statistical</p>

	<p>speech (it will complete the outcome of the test).  Pass-mark will be reached when the student will show a basic use of the core concepts/terms of the course.  Better he/she will perform, higher will be the assessment.</p> <p>Final mark  Final mark will consider of the outcomes of both written test and oral exam.  Final passing mark for the whole course is in [18; 30]: it comes from the simple mean of the final marks of the two exams. The teacher could also take into account some student context characteristics (disability, or level of participation during lessons).</p>
<b>EDUCATIONAL OBJECTIVES</b>	The aim of the course is to teach the phases need for planning a complex sampling survey. During the lessons the teacher will take into account the better choice among different sampling techniques considering aims, available data, kind of finite population and quality of the results. Furthermore, a comparison between strengths and weaknesses of each sampling technique will be stressed.
<b>TEACHING METHODS</b>	Frontal teaching and guided exercises in classroom under the supervision of the teacher.
<b>SUGGESTED BIBLIOGRAPHY</b>	Cicchitelli G., Herzel A., Montanari E. Il campionamento statistico, il Mulino, Bologna, 1992. Capitoli III; IV; V; VI; VII e X Cochran W., Sampling techniques, J. Wiley & sons, New York, 1977. Capitoli 8, 9, 9a, 10; 11 Kish L., Survey sampling, J. Wiley & sons, New York, 1995 (lettura consigliata)

### SYLLABUS

Hrs	Frontal teaching
2	Introduction to the course. Description of the fundamentals learning aims, contents and the assessment procedure.
4	The principles of complex sampling techniques.
18	Sampling from a finite population. The main probabilistic sampling plans: systematic sampling; cluster sampling and two stages sampling for the estimation of mean, proportion and a total. Identification of sampling size in the three sampling techniques.
8	Sampling techniques and estimators for proportional to size sampling methods.
4	Sampling and non sampling errors in sampling techniques.
Hrs	Practice
5	The surveyselect procedure in SAS.
10	Systematic sampling; cluster sampling and two stages sampling for the estimation of mean, proportion and a total. Identification of sampling size in the three sampling techniques. Estimators for proportional to size sampling methods.
12	Systematic sampling; cluster sampling and two stages sampling for the estimation of variances of mean, proportion and a total.