



UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Economics and statistical Sciences

A.Y. 2023/2024

DEGREE COURSE IN STATISTICS AND DATA SCIENCE

Characteristics



Class of Master's Degree
(MSc) on Statistics (LM-82)



2 YEARS



PALERMO



FREE ACCESS



2235

Educational objectives

Specific objectives:

The 2nd cycle Degree in Statistics and Data Science, consistent with the requirements of the class educational objectives and with the indications coming from the surveys on the employment market of graduates in statistical disciplines (such as, for example, the AlmaLaurea interuniversity initiative), aims at training graduates who, with a solid, high level, background in mathematics, probability, statistics and computer science, are able to operate in various fields of application with autonomy and responsibility and to enter the labour market as qualified experts, able to produce, manage and analyse diversified information flows.

The Degree Course provides the tools to obtain solid statistical methodological groundings together with the typical tools of specific application contexts. The frontal teaching activity is characterized by the strong integration between theoretical lessons and exercises and laboratories, and is addressed to the training of two strongly defined professional figures: the first one with respect to statistical methods for biostatistics, and the second one to quantitative methods of risk management.

In addition, the agreement with the University of Minho (Portugal) was activated for the attainment of a double degree.

The educational programme is characterized by:

- the presence of a package of common advanced courses of mathematical, probabilistic and statistical subjects, providing students the deepening and acquisition of useful knowledge for the subsequent methodological and applicative expansions of the statistics;

- a high degree of personalization of the Study Plan (about 40 credits) by students, to whom two specializations regarding the biostatistics field and the financial field are strongly recommended;

- the attention to teaching methodologies, where a solid theoretical training, based on lectures, is integrated with computer laboratories, in which cases and real problems will be discussed and issues of applicative relevance where Statistics is an indispensable tool of analysis will be investigated. In this way, the course facilitates the development of adequate critical skills in students which, starting from a solid methodological basis, leads them to maintain constant attention also to the process of data formation - in the conceptual aspects of definition and measurement - and a critical use of theories and methods, in relation to the nature and meaning of the available data, transforming the latter into information and therefore into knowledge that can be used for decision-making purposes.

Laboratory activities must also contribute to develop communication skills, through the preparation and presentation of written and/or oral reports. Particular attention is given to language skills, in two directions: a) advanced study of English for specific purposes (ESP), with a specialized approach compared to the generalist one of the first cycle; b) deepening of the spoken language with the introduction of a period (one week) of lessons, per semester, carried out in English, during which the teacher encourages students to dialogue in English on the illustrated topics.

In addition, some of the elective subject, chosen within other courses of the University, are entirely carried out in English. Finally, there is the possibility of spending a period of internship in companies or private and public organizations (3 credits), and the possibility of allocating up to 3 credits to activities (competences related to the labour market) in which a real statistical consultation is simulated under the supervision of the teachers of the Course. The objective is to provide

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students with both soft and professional advanced knowledge and skills, for conducting a statistical consultancy. This experience is not only a useful showcase for companies, but also an added value for graduates who face the labour market, because they have had the opportunity to directly experience their relational and professional skills with future clients/users;

- the possibility, from year to year, to provide for small measures, such as inclusion of courses or profiles responsive to the labour market, favouring the employment opportunities of graduates;

- The possibility of obtaining the title of “Mestre em Estatística”, issued by the Universidade do Minho (Portugal), after having attended, and passed the related examinations, of a teaching package held by the same structure.

Professional opportunities

Profile:

statistician/support to credit risk assessment

Functions:

Analysis of data and support for risk management activities in the financial and credit area.

Skills:

- design and implementation of assessment activities for quality management and for the assessment of bank performance;
- certification of statistical methodologies and techniques applied to surveys;
- analysis of data and formalization of mathematical/statistical models to investigate phenomena and to make predictions in the various application areas with particular reference to risk management;
- design, creation and management of databases for the statistical risk analysis connected to internal and external aspects of the financial and credit system.

Professional opportunities:

- in public administrations;
- in the research offices of companies operating in the economic, financial and insurance fields;
- in the statistical branches of medium-large companies,
- in marketing offices of production and distribution companies,
- in information systems management companies;
- in statistical consultancy providing external support activities for private and public companies;
- in public and private research centres and institutes.

Profile:

biostatistician

Functions:

Data analysis and support in clinical, epidemiological and biological research.

Skills:

- Design of complex statistical surveys related to the specific fields of specialization;
- design, analysis and verification of the results of controlled clinical experiments and trials;
- design and implementation of evaluation activities aimed at quality management and performance measurement;
- knowledge and application of statistical methodologies and techniques in relation to the type of data and research objectives;
- data analysis and formalization of mathematical/statistical models to investigate the phenomena and to make predictions in the biological, health and epidemiological fields;
- design and creation, for the part of statistical competence, of databases for statistical analysis purposes.

Professional opportunities:

In healthcare companies, both in the clinical and in the epidemiological and management areas.

In the health departments in the evaluation and epidemiology areas.

In design and testing branches of companies operating in the biomedical, epidemiological, biological sectors; in public and private research centres and institutes

Final examination features

To obtain the degree, students must have acquired 120 credits, including the ones attributed to the final examination, which are at least 18. The final written original dissertation has the objective to demonstrate the level of maturity and critical skills of candidates, with respect to the acquired knowledge and skills, at the conclusion of the activities envisaged by the educational programme.

| Subjects 1 ° year | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|-----------|-----|
| 22378 - EXPLORATIVE METHODS FOR BIG DATA - INTEGRATED COURSE | 9 | 1 | V | | |
| - DATA MINING Plaia(PO) | 6 | 1 | | SECS-S/01 | B |
| - TEXT MINING Albano(RD) | 3 | 1 | | SECS-S/01 | B |
| 15511 - SAMPLING PLANS FOR SOCIAL SCIENCES Giambalvo(PO) | 8 | 1 | V | SECS-S/05 | B |

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| Subjects 1 ° year | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|-----------|-----|
| 16439 - STOCHASTIC PROCESSES <i>Adelfio(PO)</i> | 6 | 1 | V | SECS-S/01 | B |
| 17629 - ADVANCED ENGLISH <i>Romeo(PA)</i> | 4 | 1 | G | | F |
| 21925 - NETWORK ANALYSIS AND OPTIMIZATION - INTEGRATED COURSE | 6 | 2 | V | | |
| - NETWORKS <i>Tumminello(PO)</i> | 3 | 2 | | SECS-S/06 | B |
| - OPTIMIZATION <i>Simonetti(RD)</i> | 3 | 2 | | SECS-S/06 | B |
| 07979 - STATISTICAL MODELS <i>Chiodi(PO)</i> | 9 | 2 | V | SECS-S/01 | B |
| 18178 - STATISTICS FOR ECONOMIC AND BUSINESS ANALYSIS <i>Cracolici(PO)</i> | 6 | 2 | V | SECS-S/03 | B |
| Optional subjects | 9 | | | | B |

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| Subjects 2 ° year | CFU | Sem. | Val. | SSD | TAF |
|---|-----|------|------|-----------|-----|
| 21977 - ADVANCED PROGRAMMING IN R FOR HIGH DIMENSIONAL DATA <i>Augugliaro(PO)</i> | 6 | 1 | V | SECS-S/01 | C |
| 21226 - ADVANCED STATISTICAL METHODS - INTEGRATED COURSE | 9 | 1 | V | | |
| - BAYESIAN STATISTICS <i>Abbruzzo(PA)</i> | 3 | 1 | | SECS-S/01 | C |
| - NON PARAMETRIC STATISTICS <i>Muggeo(PO)</i> | 6 | 1 | | SECS-S/01 | C |
| 05917 - FINAL EXAMINATION | 15 | 2 | G | | E |
| Optional subjects II | 9 | | | | C |
| Optional subjects III | 6 | | | | C |
| Stage and others | 9 | | | | F |
| Free subjects (suggested) | 9 | | | | D |

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OPTIONAL SUBJECTS

| Stage and others | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|-----------|-----|
| 22556 - ADVANCED STATISTICAL CONSULTING 1 | 3 | 1 | G | | F |
| 22558 - ADVANCED STATISTICAL CONSULTING 2 | 3 | 1 | G | | F |
| 22557 - ADVANCED STATISTICAL CONSULTING 3 | 3 | 1 | G | | F |
| 22154 - PRACTICE | 9 | 1 | G | | F |
| 07899 - PROFESSIONAL PRACTICE | 6 | 1 | G | | F |
| 07553 - PROFESSIONAL PRACTICE | 3 | 1 | G | | F |
| Optional subjects | CFU | Sem. | Val. | SSD | TAF |
| 23163 - BIOSTATISTICS - INTEGRATED COURSE | 9 | 2 | V | | |
| - ADVANCED SURVIVAL ANALYSIS <i>Attanasio(PO)</i> | 6 | 2 | V | SECS-S/05 | B |

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OPTIONAL SUBJECTS

| Optional subjects | CFU | Sem. | Val. | SSD | TAF |
|--|-----|------|------|-----------|-----|
| - STATISTICAL MODELS IN CLINICAL RESEARCH <i>Attanasio(PO)</i> | 3 | 2 | V | SECS-S/05 | B |
| 23162 - STATISTICAL MODELS FOR THE EVALUATION OF SERVICES - INTEGRATED COURSE | 9 | 2 | V | | |
| - APPLICATIONS IN THE SOCIAL FIELD <i>Giambalvo(PO)</i> | 3 | 2 | V | SECS-S/05 | B |
| - APPLICATIONS IN THE ECONOMIC FIELD <i>Vassallo(PA)</i> | 6 | 2 | V | SECS-S/03 | B |
| Optional subjects II | CFU | Sem. | Val. | SSD | TAF |
| 20668 - CATEGORICAL DATA - INTEGRATED COURSE | 9 | 1 | V | | |
| - MODELS FOR CATEGORICAL DATA <i>Sciandra(PA)</i> | 6 | 1 | V | SECS-S/01 | C |
| - STOCHASTIC NETWORKS <i>Abbruzzo(PA)</i> | 3 | 1 | V | SECS-S/01 | C |
| 23158 - STATISTICAL METHODS AND MODELS FOR FINANCIAL MARKETS - INTEGRATED COURSE | 9 | 1 | V | | |
| - STATISTICAL MODELS FOR VOLATILITY <i>Vassallo(PA)</i> | 6 | 1 | V | SECS-S/03 | C |
| - PENALIZED STATISTICAL MODELS <i>Sottile(RD)</i> | 3 | 1 | V | SECS-S/01 | C |
| Optional subjects III | CFU | Sem. | Val. | SSD | TAF |
| 19272 - ARTIFICIAL INTELLIGENCE AND DEEP LEARNING <i>Lo Bosco(PA)</i> | 6 | 2 | V | INF/01 | C |
| 19976 - BID DATA MANAGEMENT <i>Rombo(PO)</i> | 6 | 2 | V | INF/01 | C |
| 18103 - BIG DATA & ANALYTICS <i>Lo Presti(PA)</i> | 6 | 2 | V | INF/01 | C |
| 18125 - DATA AND MODELS FOR MANAGEMENT DECISIONS <i>Dardanoni(PO)</i> | 6 | 2 | V | SECS-P/03 | C |
| 18649 - DOCIMOLOGY WITH DOCIMOLOGY WORKSHOP | 6 | 2 | V | M-PED/04 | C |
| 20732 - EMOTIONAL INTELLIGENCE IN DEVELOPMENT <i>D'Amico(PA)</i> | 6 | 2 | V | M-PSI/04 | C |
| 01662 - ENVIRONMENTAL BIOMONITORING <i>Naselli Flores(PA)</i> | 6 | 2 | V | BIO/03 | C |
| 05640 - EXPERIMENTAL PEDAGOGY | 6 | 1 | V | M-PED/04 | C |
| 18128 - FINANCIAL PLANNING AND CONTROL <i>Quarchioni(RD)</i> | 6 | 2 | V | SECS-P/07 | C |
| 18132 - GAME THEORY <i>Modica(PO)</i> | 6 | 1 | V | SECS-P/01 | C |
| 22375 - GENETIC STATISTICS AND BIOINFORMATIC APPLICATIONS <i>Bertolazzi(RD)</i> | 6 | 2 | V | SECS-S/01 | C |
| 03553 - GENETICS <i>Corona(PA)</i> | 6 | 2 | V | BIO/18 | C |
| 19862 - MATHEMATICS DIDACTICS AND TEACHING METHODOLOGY <i>Cerroni(PO)</i> | 6 | 1 | V | MAT/04 | C |

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OPTIONAL SUBJECTS

| Optional subjects III | CFU | Sem. | Val. | SSD | TAF |
|---|-----|------|------|-----------|-----|
| 18584 - OPEN DATA MANAGEMENT TECHNIQUES <i>Taibi(IE)</i> | 6 | 2 | V | INF/01 | C |
| 15506 - RISK MANAGEMENT <i>Scannella(PO)</i> | 6 | 1 | V | SECS-P/11 | C |
| 18119 - SCENARIO ANALYSIS FOR FINANCE <i>Cipollini(PO)</i> | 6 | 2 | V | SECS-P/05 | C |
| 06318 - SCIENCE OF FINANCE <i>Berrittella(PA)</i> | 6 | 1 | V | SECS-P/03 | C |
| 23500 - STATISTICAL MACHINE LEARNING <i>Sottile(RD)</i> | 6 | 1 | V | SECS-S/01 | C |
| 18122 - TOPICS IN MACRO AND FINANCIAL ECONOMETRICS <i>Cipollini(PO)</i> | 6 | 1 | V | SECS-P/05 | C |
| Free subjects (suggested) | CFU | Sem. | Val. | SSD | TAF |
| 22379 - ADVANCED STATISTICAL CONSULTING - 3 CREDITS | 3 | 1 | G | SECS-S/01 | D |
| 22380 - INTERNSHIP 6 CREDITS | 6 | 1 | G | SECS-S/01 | D |
| 22382 - INTERNSHIP 9 CREDITS | 9 | 1 | G | SECS-S/01 | D |
| 07599 - PROFESSIONAL PRACTICE 3 | 3 | 1 | G | SECS-S/01 | D |

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