

Degree Course in Dentistry and Dental Prosthetics

Course: Behavioral sciences and scientific methodology

CFU Number: 9

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Module: Medical statistics

CFU Number: 4

SSD Course: MED/01

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Module: Information Technology

CFU Number: 4

SSD Course: INF/01

Professor name: Andrea Dimitri, mail: andrea.dimitri@unicamillus.org

Module: Psychology

CFU Number: 1

SSD Course: M-PSI/01

Professor name: Prof. Armando Piccinni, mail: armando.piccinni@unicamillus.org

PREREQUISITES:

Knowledge and skills in mathematics, statistics and basic computer science at secondary school level, including arithmetic, algebra, Euclidean geometry, trigonometry and elements of differential and integral calculus. However, the teaching does not include preliminary qualifications.

LEARNING OBJECTIVES:

Aim of the integrated course of Behavioral sciences and scientific methodology (Medical Statistics, Information Technology and Psychology) is to provide students with knowledge on the fundamentals of statistics, informatics and psychology necessary for their future activity.

In particular, aim of the Teaching is:

- to provide students with the basic knowledge to understand the essential role of Information Technology (IT) in our society, and specifically in the context of health-related technical professions.
- to achieve a solid preparation in theoretical, design and operational fields of psychology, including innovative research techniques.
- to achieve ability to use cognitive and intervention tools aimed at prevention, diagnosis and rehabilitation and psychological support activities.
- to acquire advanced level skills to establish relevant characteristics of people, families and groups.
- to acquire the ability to plan relational interventions and to manage congruent interactions with the needs of people, families and groups.



- to acquire the ability to assess the quality, effectiveness and appropriateness of interventions.
- being able to take responsibility for interventions, to exercise full professional autonomy and to work collaboratively in multidisciplinary groups.
- to acquire knowledge on the main IT tools and on the electronic communication in the specific areas of competence.
- to understand the importance of medical statistics in the research methodology in the medical field.
- to read a basic biomedical scientific article, understanding its structure and critically evaluating methods and results.
- to handle a simple database, with particular reference to clinical medicine.
- to make a descriptive and inferential analysis.

LEARNING OUTCOMES:

At the end of the course the student will be able to:

1. Knowledge and Understanding:

- know the tools and computer concepts that will be useful for his future profession in the medical field.
- know the basics of an information system and of an information system of a health facility. In addition, he must know how a database is organized and must know some basic notions of database query languages. Must know the security and privacy issues associated with handling sensitive and non-sensitive data such as health data. Must know the problems related to the reading of data from electronic instruments, units of measurement, standards, errors.
- know the main software for the analysis of health data (Excel, R).
- know the general principles of psychology and the neuroscientific foundations of psychology.
- know the Higher mental functions.
- know and describe the Lifespan development.
- know and describe the personality theories and the various psychopathological disorders.
- carry out a descriptive analysis of a simple database.
- evaluate the association between variables.
- know the basic principles of correlation and linear regression analysis.
- know and apply frequency and effect measurements.
- explain how statistical inference is applied to biomedical research.
- demonstrate an understanding of probability and its application.
- demonstrate ability to manage data and to draw and present quantitative results effectively, using appropriate tables, figures and summaries.
- describe the nature of the sampling variation and the role of the statistical methods in quantifying it, and be able to calculate the confidence limits and evaluate the hypotheses.
- select and use appropriate statistical methods in the analysis of simple data sets.



- interpret and evaluate the results of statistical analyses within a scientific publication.
- present and discuss the results of statistical analyses in a clear, concise and comprehensible way.
- describe the general principles of the calculation of the sample size and power.

2. Applying Knowledge and Understanding:

- Apply the principles of informatics, statistics and psychology to selected problems and to a variable range of situations.
- Use the tools, methodologies, language and conventions of informatics, statistics and psychology to test and communicate ideas and explanations.

3. Communication Skills:

- Present the topics verbally in an organized and consistent manner.
- Utilize a proper scientific language coherent with the topic of discussion.
- Apply the basics of health professional -patient communication.
- Apply the basics of verbal and non-verbal communication.
- Use the updated tools for communication and management of information, experience and professional skills in the field of services aimed at people, families and groups.

4. Making Judgements:

- Recognize the importance of an in-depth knowledge of the topics consistent with a proper medical education.
- Identify the fundamental role of a proper theoretical knowledge of the topic in the clinical practice.

COURSE SYLLABUS

INFORMATION TECHNOLOGY SYLLABUS

1. Introduction to health information systems. The Italian health information system. Health standards for data acquisition, storing and visualization. The electronic medical record. The xml language. The dicom standard in medical imaging.
2. Privacy and security in the management of healthcare data. The european GDPR regulation.
3. Introduction to databases. The E-R schema. RDBMS: tables, records, fields, queries using the SQL language. Public health databases:
 - PubMed, Medline, Medline plus.
 - Cochrane Library
4. Data mining in Healthcare. How to read the output of a statistical package. Creation and management of a data sheet in Excel. The use of R.

PSYCHOLOGY SYLLABUS

4.1 General principles of psychology



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What is psychology? History of psychology
Main psychological perspectives social psychology

4.2 Neuroscientific foundation of psychology

The brain: principles of anatomy and of physiology.
Functions, emotions and behaviors

4.3 Higher mental functions

Thinking
Language
Intelligence
Consciousness
Learning
Memory

4.4 Lifespan development

Prenatal psychology
Developmental psychology
Childhood Psychology
Adulthood Psychology
Death psychology

4.5 Personality Theories

4.6 Psychopathological disorders

Anxiety disorders
Mood disorders
Psychotic disorders

MEDICAL STATISTICS SYLLABUS

Introduction to biomedical statistics

- Types of data, evaluation and presentation of data
- Probability: assessment and role of probability
- The binomial distribution
- Normal distribution
- Principles of statistical inference
- Inference from a sample mean
- Comparison of two averages
- Inference from a sample proportion
- Comparison between two proportions
- Association between two categorical variables
- Effect measurement in 2 x 2 tables
- Combined analysis for associated binary data
- Correlation
- Linear regression
- Non-parametric methods
- Introduction to the calculation of the sample size
- Cohort studies



- Introduction to survival analysis
- Case-control studies
- Probability
- Introduction to multivariate regression
- Introduction to logistic regression
- Introduction to the Poisson and Cox regression
- Strategies of analysis

COURSE STRUCTURE

The teaching consists of hours of frontal teaching, 40 hours of Information Technology, 10 hours of Psychology and 40 hours of Medical Statistics. The frontal teaching includes hours of theoretical lessons followed by hours of exercises, reference to concrete case studies and possible seminars on the topics covered. **The attendance at lectures is mandatory.**

COURSE GRADE DETERMINATION

The exam of the Integrated Course of Behavioral sciences and scientific methodology is comprised of an evaluation test of Information Technology, an evaluation test of Psychology, and one of Medical Statistics whose marks are an integral part of the Integrated Course exam evaluation.

INFORMATION TECHNOLOGY ASSESSMENT TEST: The final exam will be carried as a computer-based written text consisting of a number of multiple-choice questions. For each question there is also a free space when the student can motivate and enter in the details of his answers.

PSYCHOLOGY ASSESSMENT TEST: The verification of the preparation of the students will take place with a written exam. During the test, the examining commission will assess the specific skills acquired.

MEDICAL STATISTICS ASSESSMENT TEST: A written exam followed by an oral exam. The written test will consist of 20 questions with multiple choice answers and two exercises. For each correct answer a point will be assigned. A maximum of 6 points will be awarded for each exercise. The final score of the written test will be given by the sum of the partial scores assigned to each question correctly answered and the scores assigned to the exercises. To access the oral exam the student must have a minimum of 18 points. During the oral exam the Examining Commission will assess the ability of the Student to apply the knowledge and will ensure that the skills are adequate to achieve the objectives. Capacity of making judgments, communication skills and learning skills will also be assessed.

OPTIONAL ACTIVITIES

In addition to the teaching activity, the student will be given the opportunity to participate in seminars, research internships, department internships and monographic courses.

READING MATERIALS/BOOK LIST:

- The lesson slides and Handouts distributed by the teacher during lessons.
- Information technology: Kathleen Mastrian, Dee McGonigle - Informatics for Health Professionals. Jones & Bartlett Learning; 1 edition (April 25, 2016)
- Medical Statistics: Essential Medical Statistics (Kirkwood, Sterne)
- Psychology: General Psychology: Briefer Course Editore: Kessinger Pub Co