

---

**COURSE: Introduction to Mathematics**

---

**ACADEMIC YEAR: 2017-2018**

---

**TYPE OF EDUCATIONAL ACTIVITY: : Basic**

---

**TEACHER: Dr. Marién Abreu**

---

e-mail: : **marien.abreu@unibas.it**

website:

phone: **0971205850**mobile (optional):

---

Language: **ITALIAN**

---

ECTS: **10** (credits)n. of hours: **80** (lessons and tutorials/practice)Campus: **Potenza**Dept./School: **Department of Sciences**Program: **Pharmacy (LM-13)**Semester: **I**  
**(from 2 October 2017 to 31 January 2018)**

---

---

**EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES**

---

The general educational goal is to develop the students' abstract thought, to provide them with basic mathematical concepts, tools and rigorous language, together with problem solving abilities and the capacity to read and understand simple mathematical texts.

To this purpose, the methods of calculus will be illustrated and applied to the analysis of real valued functions in one variable. The matrix methods for solving systems of linear equations will be presented, as well as the basic methods of descriptive statistics in the context of life sciences.

In this way, it is an expected learning outcome that the students will become skillful at differential and integral calculus, matrix operations and statistical data analysis.

---

**PRE-REQUIREMENTS**

---

Knowledge and skills in the following arguments: equations and inequalities of first, second and higher degrees; polynomials: operations and properties; the equation of a line; trigonometric functions and main identities; properties of powers, exponentials and logarithms.

---

**SYLLABUS**

---

1. *Elements of calculus (40 hours)*: sets, number sets, numerical sequences, functions, limits, continuity, differential calculus in one variable, analysis of a function, integral calculus in one variable.
2. *Linear Algebra (20 hours)*: matrices, matrix operations, invertible matrices, matrix determinant, inverse matrix. Systems of linear equations and the Gaussian elimination method.
3. *Elements of Statistics (20 hours)*: Data and sampling. Graphic presentations. Measures of location: arithmetic mean, geometric mean, median, mode. Measures of dispersion: quartiles, interquartile range, variance and standard deviation. Normal distribution. Coefficient of correlation and linear regression line.

---

**TEACHING METHODS**

---

The course consists of 80 hours of theoretical lessons in which multimedia material is often used to present the contents. During some of these lessons, classroom tutorials will be carried out.

---

**EVALUATION METHODS**

---

Final written and oral examination. The purpose of the exam is to verify the degree of accomplishment of the expected learning outcomes described above. The written test has three parts, each corresponding to one of the main arguments of the course. If it is possible to infer from the written exam that the theoretical knowledge of the student is sufficient, then the final mark corresponds to that of the written exam without a further oral examination. If, on the contrary, there are theoretical shortages, but the total mark is greater than or equal to 18, then the student will be admitted to an oral examination and the final mark will be the outcome of such evaluation.

---

---

#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- J. Stewart: *Calcolo. Funzioni di una variabile*, Apogeo Education 2013
  - P. Marcellini e C. Sbordone: *Elementi di Calcolo*, Liguori Editore 2004
  - P. Marcellini e C. Sbordone: *Esercitazioni di Matematica, I volume*, Liguori Editore 1995
  - E. Sernesi: *Geometria Vol. 1, 2ª edizione*, Bollati Boringhieri 1989
  - V. Villani: *Matematica per discipline bio-mediche*, McGraw Hill 2001
  - Teacher's class notes will be available at the end of the course in a shared folder
- 
- 

#### INTERACTION WITH STUDENTS

At the beginning of the course, the teacher will describe the goals, the program and the evaluation methods. At the same time, a list of the students who intend to follow the course will be gathered, requesting name, surname, student ID and email. At the end of the course, the teacher's class notes will be available in a shared folder.

Office hours: Tuesday and Thursday from 11:30 to 13:30 at the teacher's office (3D-219). Outside office hours, the teacher will be available for contact via email and/or by appointment.

---

---

#### EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

7/2/2018; 7/3/2018; 22/5/2018; 12/6/2018; 10/7/2018; 12/9/2018; 12/12/2018 (indicative only, may vary).

---

---

SEMINARS BY EXTERNAL EXPERTS    YES     NO

---

---

#### FURTHER INFORMATION

---

<sup>1</sup>Subject to possible changes: check the web site of the Teacher or the Department/School for updates.