



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Architettura
ACADEMIC YEAR	2020/2021
BACHELOR'S DEGREE (BSC)	TOWN PLANNING AND URBAN STUDIES
SUBJECT	MATHEMATICS
TYPE OF EDUCATIONAL ACTIVITY	A
AMBIT	50092-Matematica, informatica statistica
CODE	04872
SCIENTIFIC SECTOR(S)	MAT/05
HEAD PROFESSOR(S)	DALBONO FRANCESCA Ricercatore Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	102
COURSE ACTIVITY (Hrs)	48
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	DALBONO FRANCESCA Thursday 14:00 16:30

PREREQUISITES	Basic knowledge of Mathematics: arithmetic (operations with natural numbers, integers, rational and real numbers); elementary algebra (linear and quadratic equations and inequalities); real functions of one real variable (elementary functions: power, logarithm and exponential functions with their corresponding properties); basic trigonometry (difference between angles measured in degrees versus angles measured in radians, the trigonometric functions sine, cosine and tangent of an angle and their values for known angles).
LEARNING OUTCOMES	Knowledge and Understanding: Acquisition of elementary concepts, tools and mathematical methods of calculus, geometry and linear algebra; development of critical thinking skills and logical reasoning abilities. Applying Knowledge and Understanding: Ability to apply the potentiality of mathematical tools in order to formalize problems and to construct mathematical models; skills to apply the theoretical concepts and the main theorems learnt during the lectures in order to solve problems. Making Judgement: Acquisition of the ability to "analyze", "decide", "be able to do"; acquisition of the ability to choose the best and simplest strategy to handle and solve problems. Communication Skills: Acquisition of ability to present the concepts and topics of the discipline rigorously, competently and with clarity. Learning Skills: Ability to find and acquire information from books and texts written in a formalized scientific language; ability to use scientific methods and deductive reasoning in different contexts. The aim of the course consists also in stimulating the students to develop a scientific curiosity.
ASSESSMENT METHODS	Written and Oral Exam. The written exam is composed of at least six exercises, and it will last three hours. In order to pass the written examination, the student will have to solve the exercises in a complete and detailed way, by explaining each step with mathematical rigour. In a 30-point grade scale, the student is admitted to the oral exam with a minimum passing grade of 16 in the written composition. The aim of the written exam consists in verifying the required knowledge and comprehension abilities. The students who attend the course can take two ongoing intermediate examinations, each with a 90 minutes duration. With a minimum passing grade of 16 in both the ongoing examinations, the students do not need to take the written exam: they are directly admitted to the oral exam. The students who pass only one ongoing intermediate examination can take the remaining intermediate examination in accordance with the regular examination schedule of January and February; Each ongoing intermediate exam is composed of at least three exercises. The oral exam is divided in two parts. In the first part the student is asked to discuss the written exam (or the two ongoing intermediate exams), while the second part consists in an oral exam on a topic chosen by the student. A detailed list of possible topics will be available at the beginning of the course. In the discussion of the written exam, the student is asked to review the written examination, and to rectify the mistakes. If the written exam shows that the student has a weakness in a particular topic, the examiner may assign written supplemental exercises in that area (the student shall be able to exhibit an, at least partial, knowledge and comprehension of the topics). Extraordinarily, in the oral exam the examiner can ask the student to solve the same exercises he/she already solved in the written exam. As mentioned above, in the second part of the oral examination, the student has to choose a topic for a 10 minute presentation. The exposition should be rigorous and complete. After the exposition, the student will have to answer at least two oral questions on the chosen subject. The final evaluation aims at appraising whether the student possesses a good knowledge and comprehension of the discipline, and whether he/she has acquired the ability to interpret and to make autonomous judgements in concrete cases. The lowest evaluation grade will be achieved if the student proves his/her knowledge and comprehension of the main subjects, at least within a general framework, and is able to apply that knowledge to solve elementary exercises. Below that threshold, the student will not be able to pass the examination. On the contrary, the more the student will be able to interact with the examiner and discuss the topics, and the more he/she will prove to have acquired the basics of Mathematics, the higher will the evaluation grade be. The evaluation grades range is comprised between 18 and 30, according to the

	following criteria: Excellent (30 – 30 e lode): Deep and broad knowledge of the topics belonging to the program, excellent language skills, good analytical, creative and interpretative capacity, ability to apply knowledge to solve problems independently and rigorously. In a 30-point grade scale, the "Lode" ("praise") can be added to the maximum grade if the student is able to answer a last question on one of the topics belonging to the program. Very good (26-29): Deep knowledge of the topics belonging to the program, very good language skills, good analytical capacity, ability to apply knowledge to solve problems independently and rigorously. Good (24-25): Good mastery of the topics belonging to the program, good language skills; good ability to apply knowledge to solve problems. Average (21-23): Basic knowledge of the main topics belonging to the program, adequate language skills, limited ability to apply knowledge to solve problems independently; the student is able to solve simple basic problems. Pass (18-20): Minimal knowledge of the topics, sufficient language skills, very poor ability to apply knowledge to solve problems independently; the student is able to solve simple problems. Fail: The student does not have an acceptable knowledge of the topics and concepts of the course.
EDUCATIONAL OBJECTIVES	The course is devoted to teach elementary concepts, tools and mathematical methods of calculus, geometry and linear algebra. The aim of the course consists also in improving critical thinking skills and developing logical reasoning abilities.
TEACHING METHODS	Lectures - Classroom Exercises
SUGGESTED BIBLIOGRAPHY	P. Marcellini, C. Sbordone - Elementi di Calcolo - Liguori Editore M. Bramanti, C.D. Pagani, S. Salsa - Matematica (Calcolo infinitesimale e algebra lineare) - Ed. Zanichelli Dispensa del docente

SYLLABUS

Hrs	Frontal teaching
16	Functions, Derivatives, Integrals
8	Linear algebra
4	Introduction to plane geometry
4	Conics
Hrs	Practice
8	Functions, Derivatives, Integrals
4	Linear algebra
2	Introduction to plane geometry
2	Conics