



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
BACHELOR'S DEGREE (BSC)	ELECTRONIC ENGINEERING
SUBJECT	MATHEMATICAL METHODS FOR ELECTRONICS
TYPE OF EDUCATIONAL ACTIVITY	C
AMBIT	10655-Attività formative affini o integrative
CODE	20501
SCIENTIFIC SECTOR(S)	MAT/07
HEAD PROFESSOR(S)	BAGARELLO FABIO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	BAGARELLO FABIO Tuesday 11:00 13:00 Stanza nr. 14, Edificio 8, Secondo piano, ex Dipartimento di Metodi e Modelli Matematici Thursday 11:00 13:00 Stanza nr. 14, Edificio 8, Secondo piano, ex Dipartimento di Metodi e Modelli Matematici

DOCENTE: Prof. FABIO BAGARELLO

PREREQUISITES	Formally none. But, for a better comprehension, Analysis and Vector calculus are strongly suggested.
LEARNING OUTCOMES	<p>Knowledge and comprehension: the student will learn how to deal with some mathematical aspects of problems relevant for them. In particular the student will learn notions of Fourier, Laplace transforms and operators on Hilbert.</p> <p>Ability of: the abstract mathematical results introduced all along the teaching will be used in the solution of concrete problems in applied mathematics, signal analysis, dynamical systems and so on.</p> <p>Autonomy of judgement: The student will be able to evaluate the degree of difficulty of the problem to be solved, and the best way to solve it. This will be achieved via an a-priori analysis of the problem itself.</p> <p>Communication skills: The student will be able to discuss all the topics taught during the course.</p>
ASSESSMENT METHODS	<p>The examination consists in a written part, where a certain number of exercises are proposed and must be solved, and an oral part, where the student is required to explain the written composition and to answer to some, more theoretical, questions.</p> <p>As for the grades: 30-30 and laude: Excellent. Full knowledge and understanding of concepts and methods of the discipline, excellent analytical skills even in solving original problems; excellent communication and learning skills. 27-29: Very good. Very good knowledge and understanding of concepts and methods of the discipline; very good communication skills; very good capability of concepts and methods applications. 24-26: Good. Good knowledge of main concepts and methods of the discipline; good communication skills; good autonomy for applying concepts and methods for solving original problems. 21-23: Satisfying. Sufficient knowledge of main concepts and methods of the discipline; satisfying communication skills; sufficient judgment autonomy. 18-20: Acceptable: acceptable knowledge of concepts and methods of the discipline; acceptable communication skills; acceptable judgement autonomy Non acceptable: Insufficient knowledge and understanding of concepts and methods of the discipline.</p>
EDUCATIONAL OBJECTIVES	A good knowledge of the theoretical and practical aspects discussed during the course, and the subsequent capacity to understand and solve problems common in Engineering.
TEACHING METHODS	We have around 34 hours of theory and 20 hours of practice
SUGGESTED BIBLIOGRAPHY	<p>Libro di testo: Fabio Bagarello, Metodi Matematici, Zanichelli Editore, 2019, ISBN: 9788808520357</p> <p>Si consigliano altresì i seguenti testi, fruibili gratuitamente a seguito di un accordo tra UNIPA e SPRINGER:</p> <p>Funzioni analitiche: Hemant Kumar Pathak, Complex Analysis And Applications, Springer 2019</p> <p>Distribuzioni: Alexander I. Saichev • Wojbor Woyczynski, Distributions in the Physical and Engineering Sciences, Volume 1, Springer 2018</p> <p>Spazi di Hilbert e operatori: Christopher Heil, Metrics, Norms, Inner Products, and Operator Theory, Springer 2018; G. Strang, Algebra lineare, Apogeo Education</p> <p>Serie e trasformate di Fourier: Tim Olson, Applied Fourier Analysis, Springer 2017</p>

SYLLABUS

Hrs	Frontal teaching
10	Analytic functions
8	Hilbert spaces
3	Fourier series
4	Fourier transform
4	Laplace transform
4	Distributions
3	Operators

Hrs	Practice
6	Complex and analytic functions
3	Hilbert spaces
2	Fourier series
2	Fourier transform
2	Laplace transform
2	Distributions
3	Operators