



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
<b>ACADEMIC YEAR</b>	2021/2022		
<b>BACHELOR'S DEGREE (BSC)</b>	BIOLOGICAL SCIENCES		
<b>SUBJECT</b>	BASIC BIOCHEMICAL METHODOLOGIES		
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	C		
<b>AMBIT</b>	10665-Attività formative affini o integrative		
<b>CODE</b>	17239		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/10		
<b>HEAD PROFESSOR(S)</b>	DE BLASIO ANNA	Professore Associato	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>			
<b>CREDITS</b>	6		
<b>INDIVIDUAL STUDY (Hrs)</b>	102		
<b>COURSE ACTIVITY (Hrs)</b>	48		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	2		
<b>TERM (SEMESTER)</b>	2° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>DE BLASIO ANNA</b></p> <p>Monday 14:00 16:00 Dipartimento STEBICEF, ed. 16 viale delle Scienze, Palermo</p> <p>Tuesday 13:00 14:00 Aula Teams "ricevimento studenti" link di accesso: <a href="https://teams.microsoft.com/channel/19%3a960f6e49ef91459b83d5f0dae1c43718%40thread.tacvGenerale?groupId=7981a70a-4c99-4814-883f-721b8bac75b6&amp;tenantId">https://teams.microsoft.com/channel/19%3a960f6e49ef91459b83d5f0dae1c43718%40thread.tacvGenerale?groupId=7981a70a-4c99-4814-883f-721b8bac75b6&amp;tenantId</a></p> <p>Thursday 12:00 13:00 Ingegneria Biomedica-Sede di Caltanissetta (via Real Maestranza)</p> <p>Friday 10:00 11:00 Dipartimento FISICA E CHIMICA, aula AP4, ed. 18 viale delle Scienze, Palermo</p>		

DOCENTE: Prof.ssa ANNA DE BLASIO

<b>PREREQUISITES</b>	Knowledge of chemistry (chemical bonds, acids and bases, chemical reactions, solutions); Organic Chemistry (classes of organic compounds, functional groups and reactivity); General knowledge of physics; Proper knowledge of biochemistry.
<b>LEARNING OUTCOMES</b>	The course provides the necessary knowledge of the physico-chemical principles of the techniques commonly used in biochemical investigation and their applications. The course aims to make the student able to individuate and critically evaluate the more appropriate methods for achieving a given experimental objective. The students must be able to evaluate the advantages and disadvantages in the use of specific procedures by critically examining scientific literature, the knowledge of resolving power and/or capacity of the technique, the chemical/physical properties of the studied substances, the availability of specific equipment and specialized personnel. Students must be able to present clearly, concisely and with proper scientific terminology the acquired knowledge. Ability to understand and review the subjects presented in the course. Ability to read, understand and comment a methodological protocol. Ability to identify, and properly employ the methods of investigation suited to solving problems related to the identification, quantification and purification of the biomolecules.
<b>ASSESSMENT METHODS</b>	Oral examination (consisting of at least four questions on the knowledge of the theoretical principles underlying the main laboratory techniques and their practical procedures) aimed to the achievement of the fundamental Learning Outcomes. The evaluation (in thirty) starts from 18/30 given when the goals achieved are just sufficient and elementary and reaches maximum 30/30 (cum laude) when the student demonstrates that has achieved the learning goals in an excellent way in a broad and conscious vision. An "in itinere" evaluations will be carry out during the course and will allow the student to self-assess their learning status and highlight any gaps to be filled with the teacher.
<b>EDUCATIONAL OBJECTIVES</b>	The course aims to provide students with a theoretical background on the techniques and methodologies used for biochemical investigation. In particular, topics related to the extraction, purification and characterization of biological macromolecules are developed.
<b>TEACHING METHODS</b>	Lectures
<b>SUGGESTED BIBLIOGRAPHY</b>	Wilson, Walker. Metodologia Biochimica (Le bioscienze e le biotecnologie in laboratorio). Cortina. edizione 5. ISBN: 8870786870 Wilson, Walker. Biochimica e Biologia molecolare. Principi e Tecniche. Cortina. edizione 8. ISBN: 8832851458 De Marco, Cini. Principi di Metodologia Biochimica. Piccin. edizione 2009. ISBN: 8829919977 Boyer. Modern experimental Biochemistry. Pearson Education (US). ISBN: 0805331115 Durante il corso verranno anche fornite le diapositive proiettate in aula.

## SYLLABUS

Hrs	Frontal teaching
2	Presentation of the discipline and declaration of purpose. Choice of a technical procedure. Choice of an experimental system.
1	Buffers for biochemical investigations. pH measurements. pH meters. Biosensors
2	Preparation of a cell-free system.
4	Preparative and analytical centrifugation techniques.
2	Extraction and differential precipitation of proteins.
2	Extraction of DNA and RNA. Dosage and estimation of the integrity and purity.
2	Applications of dialysis and ultrafiltration. Lyophilization (Freeze-Drying).
10	Spectroscopic techniques: Absorption spectrophotometry; Fluorescence spectrophotometry; Flow cytometry; nephelometry and turbidimetry; Atomic spectroscopy.
2	Enzymatic techniques: Dosage; Characterization; Purification.
6	Chromatographic techniques. Types of chromatography: Adsorption; Partition; Ion-exchange; Ion-pair; Gel exclusion; Affinity. Gas chromatography. High performance liquid chromatography (HPLC).
6	Electrophoretic techniques: electrophoresis in absence and in presence of a support medium; High voltage electrophoresis (HVE); Isoelectric focusing; isotachopheresis; Pulsed-field gel electrophoresis (PFGE); Electrophoretic mobility shift assay (EMSA); Capillary electrophoresis; Immunoelectrophoresis; Densitometry; Blotting procedures.
2	Immunochemical methods
3	Cell colture techniques and application examples.
Hrs	Others
4	in itinere evaluations