

**COURSE OF STUDY: PHARMACY**
**ACADEMIC YEAR: 2023-2024**
**ACADEMIC SUBJECT: ANALYSIS OF MEDICINAL PRODUCTS**

General information	
Year of the course	2
Academic calendar (starting and ending date)	Second semester (19 February 2024 – 14 June 2024)
Credits (CFU/ETCS):	7
SSD	CHIM08
Language	ITALIAN
Mode of attendance	Mandatory attendance

Professor/ Lecturer (A-E)	
Name and Surname	<b>ANTONIO CARRIERI</b>
E-mail	<b>antonio.carrieri@uniba.it</b>
Telephone	080.5442638
Department and address	Pharmacy - Drug Sciences Department
Virtual room	Microsoft Teams Platform
Office Hours and modalities	Every day (in presence and/or online) by appointment

Professor/ Lecturer (F-N)	
Name and Surname	<b>ALESSIA CATALANO</b>
E-mail	<b>alessia.catalano@uniba.it</b>
Telephone	080.5442746
Department and address	Pharmacy - Drug Sciences Department
Virtual room	Microsoft Teams Platform
Office Hours and modalities	Mon/Wed/Fri 10–11 am (in presence and/or online)

Professors/ Lecturers (O-Z)		
Name and Surname	<b>ALESSIA CATALANO</b>	<b>ANTONIO LAGHEZZA</b>
E-mail	<b>alessia.catalano@uniba.it</b>	<b>antonio.laghezza@uniba.it</b>
Telephone	080.5442746	0805442745
Department and address	Pharmacy - Drug Sciences Department	Pharmacy - Drug Sciences Department
Virtual room	Microsoft Teams Platform	Microsoft Teams Platform
Office Hours and modalities	Mon/Wed/Fri 10–11 am (in presence and/or online)	Mon/Fri 3-5 pm (in presence and/or online)

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
85	40	45	90
CFU/ETCS			
7	4	3	

Learning Objectives	Acquiring knowledge relative to quality control and drug dosages
---------------------	--

<b>Course prerequisites</b>	<i>Basic knowledge of general chemistry, analytical chemistry, physics and organic chemistry</i>
<b>Teaching strategies</b>	<i>Lessons, exercises in classroom and laboratory</i>
<b>Expected learning outcomes in terms of</b>	<i>Knowledge and understanding will be evaluated through the 5 Dublin Descriptors.</i>
<b>Knowledge and understanding on:</b>	<p><b>DD1 - Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>○ <i>use of glassware in the laboratory</i></li> <li>○ <i>acid-base reactions</i></li> <li>○ <i>precipitates and complexes formation</i></li> <li>○ <i>red-ox reactions</i></li> <li>○ <i>application of these principles to classical volumetric analyses</i></li> <li>○ <i>Instrumental techniques and statistical principles to be applied to the evaluation of the results</i></li> </ul>
<b>Applying knowledge and understanding on:</b>	<p><b>DD2 - Applying knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>○ <i>selecting a method and applying quantitative analysis to the determination of analytes as part of quality control</i></li> <li>○ <i>critical evaluation of the results of an analysis by the application of statistical analysis principles</i></li> </ul>
<b>Soft skills</b>	<p><b>DD3 - Making informed judgments and choices</b></p> <ul style="list-style-type: none"> <li>○ <i>stand-alone evaluation of the results obtained from the studied assays</i></li> <li>○ <i>indicate the correct assays to be used to obtain the desired results even though different from those reported in Pharmacopoea</i></li> <li>○ <i>problem solving</i></li> </ul> <p><b>DD4 - Communicating knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>○ <i>preparation of data reports</i></li> <li>○ <i>utilization of graphic tools</i></li> <li>○ <i>working as a team</i></li> <li>○ <i>being able to clearly explain, even to inexperienced people, the chemical procedures used in a quantitative analysis</i></li> <li>○ <i>being able to draw up results reports appropriately, i.e. by providing the information necessary for its application</i></li> <li>○ <i>being able to explain the analysis methods and the causes of any error using an appropriate technical language</i></li> </ul> <p><b>DD5 - Capacities to continue learning</b></p> <ul style="list-style-type: none"> <li>○ <i>the student must learn the methodologies used during the course</i></li> <li>○ <i>the student must be able to understand and use analytical methods described in texts and/or scientific articles</i></li> </ul>
<b>Syllabus</b>	
<b>Content knowledge</b>	<p><i>General: Quantitative analysis, mass measurement</i></p> <p><i>Titration:</i></p> <p style="padding-left: 40px;"><i>Alkalimetric and acidimetric titrations</i></p> <p style="padding-left: 40px;"><i>Precipitation titrations</i></p> <p style="padding-left: 40px;"><i>Complexometric titrations</i></p> <p style="padding-left: 40px;"><i>Redox titrations</i></p> <p><i>Main instrumental methods of analysis</i></p> <p style="padding-left: 40px;"><i>Electrochemical methods</i></p> <p style="padding-left: 40px;"><i>Potentiometry</i></p> <p style="padding-left: 40px;"><i>Conductometry</i></p> <p style="padding-left: 40px;"><i>Spectroscopic methods</i></p> <p><i>Experimental errors and analytical data evaluation</i></p>

	<i>Safety - Introduction to practical laboratory of analysis. Warnings and safety rules. CLP Regulation.</i>
<b>Texts and readings</b>	<i>Carrieri: Manuale di Analisi Quantitativa dei Medicinali (EdiSES – Napoli) Hage - Carr: Chimica Analitica e Analisi Quantitativa (Piccin – Padova) Skoog – West: Fondamenti di Chimica Analitica (EdiSES – Napoli)</i>
<b>Notes, additional materials</b>	<i>Additional material provided by the teachers for laboratories</i>
<b>Repository</b>	<i>Microsoft Teams Platform and/or direct sending by the teacher as electronic documents</i>

<b>Assessment</b>	
Assessment methods	Exam exemption (only writing) to be taken not before reaching 50% of the lectures. Writing exam (partial test, only for students that have not passed exam exemption). It will be completed with the speaking exam. Moreover, laboratory test results (with evaluation of the error provided contextually by the teacher) will be taken into account.
Assessment criteria	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding:</i> <ul style="list-style-type: none"> <li>○ The student must be able to compare the different problems typical of the analytical methods of the Italian Pharmacopoeia, and critically discuss the resolution of the same</li> </ul> </li> <li>• <i>Applying knowledge and understanding:</i> <ul style="list-style-type: none"> <li>○ Critical issues regarding purity methods evaluation and control of drugs</li> </ul> </li> <li>• <i>Autonomy of judgment</i> <ul style="list-style-type: none"> <li>○ Ability to individually identify determinate errors and outliers</li> </ul> </li> <li>• <i>Communicating knowledge and understanding:</i> <ul style="list-style-type: none"> <li>○ reports of practical tests with presentation of data accompanied by graphs and equations</li> </ul> </li> <li>• <i>Capacities to continue learning:</i> <ul style="list-style-type: none"> <li>○ ability to discursively organize knowledge</li> <li>○ ability of critical argumentation of the performed study</li> </ul> </li> </ul>
Final exam and grading criteria	<i>The final evaluation will take into account the exam exemption or the partial writing test and any oral test, along with the results of the laboratory tests. The final mark is awarded in thirtieths and possible Honours. The exam is considered passed when the grade is higher than or equal to 18.</i>
<b>Further information</b>	

