COURSE DESCRIPTION

1. Program data

1.1 Higher education institution	**"ALEXANDRU IOAN CUZA" UNIVERSITY OF IASI**
1.2 Faculty	**CHEMISTRY**
1.3 Department	**DOCTORAL SCHOOL OF CHEMISTRY**
1.4 Field of study	**CHEMISTRY**
1.5 Cycle of studies	**DOCTORATE**
1.6 Study Programme/Qualification	**DOCTOR OF CHEMISTRY**

2. Discipline data

2.1 Name of the discipline			**FUNDAMENTAL CONCEPTS AND RECENT DEVELOPMENTS IN CHEMISTRY - MODULE II**				
2.2 Course Activity Holder			**Prof. univ. dr. habil Romeo-Iulian OLARIU** **Prof. univ. dr. asoc. Gabi DROCHIOIU**				
2.3 Owner of seminar activities							
2.4 Year of study	**I**	**2.5** Semester	**1**	**2.6** Type of evaluation	**C**	**2.7** Discipline regime	**OB**

* *OB – Mandatory / OP – Optional*

3. Total estimated time (hours per semester and teaching activities)

3.1 Number of hours per week	**1**	of which: **3.2.** course	**1**	**3.3**. Seminar	**-**
3.4 Total hours in the curriculum	**14**	of which: **3.5.** course	**14**	**3.6**. Seminar	**-**

Distribution of the time fund	hours
Study by textbook, course material, bibliography and others	24
Additional documentation in the library, on specialized electronic platforms and in the field	50
Preparation of seminars/laboratories, assignments, papers, portfolios and essays	10
Tutoring	-
Examination	2
Other activities	-

3.7 Total individual study hours	86
3.8 Total hours per semester	100
3.9 Number of credits	**4**

4. Preconditions (if applicable)

4.1 Curriculum	
4.2 Competences	

5. Conditions (if applicable)

5.1 Course Conduct	
5.2 Conduct of the laboratory	

6. Specific competences accumulated

Professional skills	**CP1:** To conceive and carry out original research, based on advanced methods that lead to the development of scientific, technological knowledge and/or research methodologies. **CP2:** Critical-constructive evaluation of the projects and results of the scientific research, appreciation of the state of theoretical and methodological knowledge; identification of the priorities of knowledge and application to the field. **CP3:** Selection and application of principles, theories and advanced methods of knowledge, transfer of methods from one field to another, interdisciplinary approaches to solve new and complex theoretical and practical problems. **CP4:** Use of advanced principles and methods for explaining and interpreting, from multiple perspectives, new and complex theoretical and practical situations/problems, specific to the field. **CP5:** Systematic, advanced knowledge of concepts, research methods, controversies and new hypotheses specific to the field; communication with specialists in related fields.
Transversal competence	**CT1:** Development of projects centered on creativity, as a basis for self-realization. **CT2:** Assuming responsibility and capacity to organize and manage the activity of professional groups, scientific research or organizations/institutions. **CT3:** Initiation and innovative development of complex theoretical and practical projects.

7. Objectives of the discipline (from the grid of specific competences accumulated)

7.1. General objective	The course aims to highlight, starting from the fundamental concepts, what are the current trends in the research carried out by the academic staff of the doctoral school of chemistry. The elements of novelty and scientific progress in the field of chemistry will be highlighted, both in relation to the specialized literature and in relation to the results obtained by the doctoral supervisors within the doctoral school of chemistry.
7.2. Specific objectives	**Obiective cognitive** ✓ Competences in identifying, developing and elaborating possible research topics. **Obiective procedurale** ✓ Skills in developing review articles for a given topic. ✓ To know the research potential of the doctoral supervisors in the doctoral school of chemistry. **Obiective atitudinale** ✓ Correct use of fundamental concepts in relation to current trends in the field of chemistry in order to achieve excellence in research.

8. Content

8.1	**Course**	**Teaching methods**	**Observations** (hours and bibliographic references)
1.	Methods for peptides and polypeptides synthesis	Lecture, explanation, conversation, description, problematization	(3.5 hours, [1]) C-CF&TAC-01
2.	Materials used during peptide and polypeptide synthesis	Lecture, explanation, conversation, description, problematization	(3.5 hours [2])
3.	Anticancer drugs of synthesis origin	Lecture, explanation, conversation, description, problematization	(3.5 hours [3])
4.	Inhibitors of polymerization reactions for microtubule-binding proteins	Lecture, explanation, conversation, description, problematization	(3.5 hours [4])

Bibliography:

1. Wang, X.Y., Wang, Y.H., Song, Z., Hu, X.Y., Wei, J.P., Zhang, J., Wang, H.S, Recent progress in functional peptides designed for tumor-targeted imaging and therapy, J. Mater. Chem. C, 9, 3749–3772, **2021**.
2. Z. Song, Z. Han, S. Lv, C. Chen, L. Chen, L. Yin, J. Cheng, Synthetic polypeptides: from polymer design to supramolecular assembly and biomedical application, Chem. Soc. Rev., 46, 6570–6599. **2017**.
3. Watanabe, T., Chemical studies on bioactive natural products directed toward development of novel antiinfective and anticancer medicines, Chemical and Pharmaceutical Bulletin, 67(7), pp. 620–631 **2019**.
4. Kaur, R., Kaur, G., Gill R.K., Soni, R., Bariwal, J., Recent developments in tubulin polymerization inhibitors: an overview. Eur J Med Chem, 87:89–124, **2014**.

9. Corroborating the content of the discipline with the expectations of the representatives of the community, professional associations and representative employers in the field related to the program

After completing and promoting the discipline, the doctoral student will be able to identify a possible research topic and will be able to carry out a research project in a given topic based on a documented literature study.

10. Rating*

Activity Type	**10.1 Evaluation criteria**	**10.2 Evaluation methods**	**10.3 Weight in final grade (%)**
10.4 Course	Correctness and completeness of knowledge as proof of the degree of correct understanding and application of the issues dealt with in the course. The degree of assimilation of the specialized language.	Colloquium – Lecture on a topic of research in the field of interest.	100
10.5 Seminar			
10.6 Minimum Performance Standard			
▪ Knowledge of the basic fundamentals for the topics of interest; ▪ Correct use of methods and techniques, materials, substances and equipment in compliance with occupational health and safety norms when performing a chemical experiment; ▪ The correct selection of the type of analysis method according to the objective of the analysis.			

Date of completion
27.09.2023

Course holder
Prof. univ. dr. habil Romeo-Iulian OLARIU

Prof. univ. dr. asoc. Gabi DROCHIOIU

Seminar holder

Date of approval

Director of the Doctoral School of Chemistry
Prof. univ. dr. habil. Cecilia ARSENE