SOFIA UNIVERSITY „ST. KLIMENT OHRIDSKI"

FACULTY OF CHEMISTRY AND PHARMACY

CURRICULUM

Signed by:	Approved by the Academic Council, Record of Proceedings № ..6..../..от...... 26 март 2025 г.

Professional Field: 4.2. Chemical Sciences
Educational and Qualification Degree: „Master"

Subject Area: Chemistry

C	H	P	3	1	2	4	2	5

Master's Degree Program: Polymer Science – in English

Form of Study: full-time
Length of Study: 3 semesters

Professional qualification: Master in Chemistry – Polymer Science

Qualification Description

Subject area: CHEMISTRY
Master's Degree program: Polymer Science - in English

1. **Educational descriptors**

The goal of the master program Polymer Science (full-time) is to train the students in new knowledge and skills in the four basic areas of the polymer science and practice: polymer chemistry and synthesis, polymer physics and theory, biopolymers and polymer materials science.

Educational objectives

The course will introduce students to the processes of synthesis, processing and application of polymers, and they will acquire knowledge and skills by mastering advanced methods for polymers and plastics synthesis, characterization and processing.

Professional objectives

Studying the disciplines included in the M.Sc. program Polymer Science provides the students with practical knowledge and skills and prepares them for working in all areas of advanced polymer science related applications.

2. **Education (knowledge, skills and competences for successful professional activities, theoretical and practical training etc).**

The full-time education in Polymer Science lasts three semesters after the bachelor degree. During the first semester are studied the following courses: Macromolecular engineering (controlled polymerization processes), Polymer blends, composites and nanocomposites, Physical methods for characterisation of polymers and polymer materials, Rheology and processing of polymers, Polymer solutions, networks and gels, Water soluble polymers and polyelectrolytes. In the second semester there are a set of courses on biopolymers (Biopolymers, Biorestorable sources polymers, Bioactive, biocompatible and pharmaceutical polymers), Physics of polymers (Phase and relaxation transitions in polymers, Theory and computer modelling of polymer systems as well as courses related to polymeric material science (Polymer fibers, films, membranes and liquid crystals, Destruction, stabilization and recycling of polymers, Inorganic polymers, Thermal analysis of polymers). There are also three different practicums, namely during the first semester the practise called Project, while in the 2nd and 3rd semesters these are Laboratory practicum 1 and 2. The idea is that each student has an assigned research project at an earlier stage and during the 1st semester within the Project he/she enters into the respective scientific area under the supervision of their scientific advisor and thus get the opportunity to do literature survey on the topic. The Laboratory practicums 1 and 2 during the 2nd and 3rd semester are devoted to laboratory work related to the research project which if successful could turn it into a diploma thesis. The expected result from these three practices is a developed research project, which the students start from the beginning with the literature survey and ends with a written report/paper under the supervision of specially appointed supervisor.

The total ECTS credits awarded upon successful graduation are 90. The distribution is as follows: 60 ECTS credits for the first year (I and II semester) and 30 ECTS credits for the second year (III semester). For the III semester (second year) the distribution is 15 ECTS for Laboratory practicum 2 and 15 ECTS credits for the diploma work defence or the state exam. The respective credits are awarded after completion of each discipline (compulsory, elective, practicum, diploma thesis defence, state exam). The student must choose a minimum of four elective disciplines: one in the first, two in the second, and one in the third semester – a total of 16 ECTS credits.

3. Professional Qualifications

All students who have completed the M. Sc. Program Polymer Science (full-time) are awarded the academic degree Master of Science with professional qualification „Master in Chemistry – Polymer Science“. The polymer courses are a substantial contribution to shaping competitive polymer specialists with state-of-the-art cognitive and practical skills. All graduates are competitive to the market demands in Bulgaria and abroad. They gain knowledge and skills to work in the industry, e.g. in the monomers and polymers production, polymers processing as well as the applications of polymers in mechanical engineering, construction, textile industry, microelectronics and semiconductor technology, the production of household appliances and household chemicals (paints, varnishes, adhesives, wallpaper, mats, linoleum, etc.), information technologies, nanotechnologies, as intelligent polymer materials, the creation of new energy sources, agriculture, the cosmetic and perfumery, pharmaceutical industries and medicine. This training allows them to successfully compete for teaching positions in higher education institutions, to realize themselves as researchers in academic and research and development units in industry, in which they could initiate and develop innovations in the most advanced areas of polymer science and the application of polymers.

4. Professional Realization

The graduates in M.Sc. in Polymer Science (full-time) can work in all scientific, educational, research and trade institutions. Moreover, the students who have completed the program Polymer Science are well qualified to continue with PhD positions in Bulgaria and abroad. Last but not least, the obtained master's degree assures training in the field of polymer science and all related to it applications such as biomedical, information and nano-technologies.

The graduates obtain competencies in field 2113 of the National classification of professions and positions in the Republic of Bulgaria (codes 6001 – 6030). The graduates of the "Polymer Science" Master programme fall within level 7 of the European qualifications framework classification.

21.2.2025 г.

P	3	1	2	4

Program code

Area of Study "Chemistry" / Master's degree Programme "Polymer Science - in English"
admission winter semester of 2025/2026 academic year

№	Course code					Course title	Type - C, E, O	Semester	ECTS credits	Classes - total number					Classes per week	Assessment* - e, ca, ce, cont.
										Total	Lectures	Seminars	Practicalclasses/Observation	Self study		
1	2					3	4	5	6	7	8	9	10	11	12	13
Core Subjects																
1	C	0	1	6		Macromolecular engineering	C	1	6	180	30	0	30	120	2/0/2	e
2	C	0	2	5		Polymer blends, composites and nanocomposites	C	1	5	150	30	0	30	90	2/0/2	e
3	C	0	3	6		Physical methods for characterization of polymers and polymer materials	C	1	6	180	45	0	30	105	3/0/2	e
4	C	0	4	5		Rheology and processing of polymers	C	2	5	150	30	0	30	90	2/0/2	e
5	C	0	5	4		Theory and computer modeling of polymer systems	C	2	4	120	30	0	30	60	2/0/2	e
6	C	0	6	4		Biopolymers	C	2	4	120	30	0	30	60	2/0/2	e
7	C	0	7	5		Polymer fibers, films, membranes and liquid crystals	C	2	5	150	45	0	30	75	3/0/2	e
Elective cources - cources with minimum 16 ECTS (total) need be elected																
1	E	0	1	4		Polymer solutions, networks and gels	E	1	4	120	30	0	30	60	2/0/2	e
2	E	0	2	4		Water-soluble polymers and polyelectrolytes	E	1	4	120	30	0	30	60	2/0/2	e
3	E	0	3	4		Element organic polymers	E	1	4	120	30	0	30	60	2/0/2	e

4	E	0	4	4	Destruction, stabilization and recycling of polymers	E	2	4	120	30	0	30	60	2/0/2	e
5	E	0	5	4	Bioactive, biocompatible and medico pharmaceutical polymers	E	2	4	120	30	0	30	60	2/0/2	e
6	E	0	6	4	Technology of cellulose and paper	E	2	4	120	30	0	30	60	2/0/2	e
7	E	0	7	4	Thermal analysis	E	2	4	120	30	0	30	60	2/0/2	e

*Courses with successfully passed exams during a period of academic mobility at a foreign higher education institution in the framework of a study agreement with Sofia University, meeting the specifics of the major and with 4 or more (ECTS) credits awarded, may be recognized and enlisted in the diploma as electives instead of those included in the present curriculum.

Internships

№	code				Practice title	Type - C, E, O	Term	ECTS credits	Weeks	Number classes	Type of course completion
1	P	0	1	5	Project	C	1	5	15	150	e
2	P	0	2	4	Laboratory practicum 1	C	2	4	15	120	e
3	P	0	3	0	Laboratory practicum 2	C	3	15	15	450	e

Degree completion

Form of degree completion	ECTS - credits	First state exam/thesis defence session	Second state exam/thesis defence session
Master thesis or State exam	15	February-March	July-September

The curriculum has been approved by the Faculty Council, Record of Proceedings № 12 from 25.02.2025

DEAN:......................

Sofia University "St. Kliment Ohridski"

Curriculum Reference Statement

Area of Study "Chemistry" /Master's Degree Programme "Polymer Science - in English"

form of study: full-time; length of study: three semesters

Course hours, ECTS-credits and number of grades per semester												
Type of courses	**I semester**			**II semester**			**III semester**			**Total**		
	Number of classes	ECTS – credits	number of grades	Number of classes	ECTS – credits	number of grades	Number of classes	ECTS – credits	number of grades	Number of classes	ECTS – credits	number of grades
Compulsory cources	**195**	**17**	**3**	**255**	**18**	**4**				**450**	**35**	**7**
Min. of elective cources	**120**	**8**	**2**	**120**	**8**	**2**				**240**	**16**	**4**
inerships	**75**	**5**	**1**	**60**	**4**	**1**	**225**	**15**	**1**	**360**	**24**	**3**
Total:	**390**	**30**	**6**	**435**	**30**	**7**	**225**	**15**	**1**	**1050**	**75**	**14**

Form of degree completion	ECTS credits	Number of hours for preparation	First thesis defence session	Second thesis defence session
Master thesis defence or State exam	15	450	February-March	July-September

Acquired Professional Qualification: Master of Chemistry - Polymer Science

Record of Proceedings of the Faculty Council № 12 from 25.02.2025

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