



Freie Universität Berlin, Humboldt-Universität zu Berlin,
Technische Universität Berlin, and Universität Potsdam

Subject-specific Course and Examination Regulations

for the joint Master of Science program in Polymer Science

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¹ Unofficial translation, without engagement (ohne Gewähr), for informal usage only. For any law proceedings only the German version is legally valid.

Subject-specific Course Regulations

for the joint Master of Science program “Polymer Science”

Based on § 74 of the law for Berlin universities (Berliner Hochschulgesetz - BerlHG) in the new version issued on July 26, 2011 (GVBl. S. 378) in connection with § 14 Sec. 1 Nr. 2 Teilgrundordnung (Erprobungsmodell) of Freie Universität Berlin of October 27, 1998 (FU-Mitteilungen Nr. 24/1998) and § 23 of Verfassung der Humboldt-Universität zu Berlin of June 28, 2011 (Amtliches Mitteilungsblatt der Humboldt-Universität zu Berlin Nr. 16/2011) und § 18 Sec. 1 Nr. 1 of Grundordnung der Technischen Universität Berlin (Amtliches Mitteilungsblatt der Technischen Universität Berlin Nr. 2/2006) as well as § 18 Sec. 1, 2; § 21 Sec. 1, 2 in connection with § 69 Sec. 1 page 2 und § 70 Sec. 2 Nr. 1 of Brandenburgisches Hochschulgesetzes (BbgHG) of Dezember 18, 2008 (GVBl. I S. 318), last amended on February 11, 2013 (GVBl.I/13, [Nr. 04]), in connection with Article 21 Sec. 2 Nr. 1 of Grundordnung der Universität Potsdam of December 17, 2009 (Amtliche Bekanntmachungen der Universität Potsdam Nr. 4/2010, S. 116), last amended on February 27, 2013 ((Amtliche Bekanntmachungen der Universität Potsdam Nr. 4/2013, S. 116) the Joint Commission of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin, the Faculty of Mathematics and Natural Sciences of the Humboldt-Universität zu Berlin, the Faculty of Mathematics and Natural Sciences and the Faculty of Process Sciences and Engineering of the Technische Universität Berlin, as well as the Faculty of Mathematics and Natural Sciences of the Universität Potsdam issued on June 7, 2013 the following Course Regulations for the joint Master of Science in Polymer Science Program:²

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§ 1 Scope of application

(1) The present regulations lay down objectives, content, and structure of the joint Master of Science in Polymer Science Program of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin, the Faculty of Mathematics and Natural Sciences of the Humboldt-Universität zu Berlin, the Faculty of Mathematics and Natural Sciences and the Faculty of Process Sciences and Engineering of the Technische Universität Berlin, as well as the Faculty of Mathematics and Natural Sciences of the Universität Potsdam based on the subject-specific Examination Regulations of June 7, 2013.

(2) For modules provided by Humboldt-Universität zu Berlin these regulations are effective in conjunction with the interdisciplinary regulations for admission, courses, and examinations of Humboldt-Universität zu Berlin (ZSP-HU), as amended. For modules provided by the Technische Universität Berlin these regulations are effective in conjunction with the regulations of the general course and examination procedures of the Technische Universität Berlin (AllgStuPO-TU), as amended. For modules provided by Universität Potsdam these regulations are effective in conjunction with the amended version of the general course and exam regulations for non-educational Bachelor and Master programs at the Universität Potsdam (BAMA-O-UP), as amended.

(3) It is a consecutive research-oriented Master's degree course according to § 23 sec. 3 no. 1 a) BerlHG.

§ 2 Qualification objectives

(1) The graduates of the master's degree program have expanded and deepened knowledge in all fields of polymer science and have a more specialized focus on one of the topics polymer chemistry, polymer physics or polymer technology. They know the terminologies, peculiarities, and limitations of the polymer sciences and can apply their professional understanding to new problems and situations, even in an interdisciplinary context. In selected areas, they have the knowledge and practical skills of the respective current state of research. They can analyze and critically review polymer science problems,

² These regulations (German version only!) were certified by the President of Freie Universität Berlin on August 27, 2013, by the President of Humboldt-Universität zu Berlin on October 22, 2014, by the President of Technische Universität Berlin on May 27, 2014, and by the President of Universität Potsdam on February 28, 2014.

independently develop solution strategies and evaluate their impact in a broader context.

(2) The graduates can take on their own responsibility and acquire knowledge independently. They can develop creative solutions for chemical, physical or technological problems within the polymer sciences and have the necessary endurance for finding solutions. They can network knowledge and take into account interdisciplinary aspects. They can conclusively present and explain project results verbally and in writing - especially in English language. They can formulate hypotheses, critically review them, and argue. They can communicate and cooperate goal oriented in a team, taking into account gender and diversity aspects.

(3) The graduates are qualified for a career in the scientific and industrial domain of polymers, for a PhD-graduation in chemistry, physics or engineering, for an activity in research and development, process and application engineering, production and analytics, or are able to establish their own business. Furthermore, they are qualified for activities in the field of patent management, knowledge management, marketing and sales, education, management, IT, consulting, and the media sector.

§ 3 Study content

(1) Macromolecular substances play an important, often indispensable role as synthetic and active components and materials in all areas of life. Correspondingly, the polymer sciences, as application-oriented cross-sectional science, cover all aspects of the investigation, description, production, processing, and application of polymeric materials and macromolecular substances with the methods of chemistry, physics, and engineering. The subjects of the Master's degree course are the concepts and experimental and theoretical methods of polymer chemistry, polymer physics, and polymer technology, especially with regard to the characterization of polymers, polymerization reactions and the underlying mechanisms, the behavior of polymers in homogeneous and heterogeneous phases and at interfaces, the synthesis of polymers from laboratory up to industrial scale, the material properties of polymer substances, the processing of polymers, the application of polymers, as well as the economic and social aspects of polymer science. Experimental techniques are learned in practical courses and research projects and are applied in an exemplary manner to current research topics. Within the domains of chemistry, physics and engineering, the Master's program in the elective phase offers further possibilities for interdisciplinary linking.

(2) The students learn to work independently on unknown problems and to search the current scientific literature. On the basis of lectures and reports, they learn to work on these problems, to report on them in writing or verbally in an appropriate manner, and to represent their results in an argumentative manner. In teamwork during lab courses and exercises, they learn to deal with gender and diversity aspects. When working in the research groups of the participating institutes, which are generally international, students also learn to take into account cultural differences.

§ 4 Structure of study program

(1) The Master's degree program, taught in English, is divided into:

- a basic phase with compulsory modules of 60 credits,
- a specialization phase with elective modules of 30 credits, and
- a master's thesis including a lecture of 30 credits.

(2) Within the scope of the basic phase, the following modules shall be completed:

- Modul: Introduction to Macromolecular Chemistry (5 LP),
- Modul: Advanced Macromolecular Chemistry (5 LP),
- Modul: Polymer Synthesis and Characterization Laboratory (5 LP),
- Modul: Polymer Characterization (10 LP),
- Modul: Introduction to Polymer Theory (5 LP),
- Modul: Polymerization Technology (9 LP),
- Modul: Polymer Processing and Surface Science of Polymers (6 LP),
- Modul: Functional Polymers and Colloids (5 LP),
- Modul: Physical and Technical Applications of Polymers (5 LP), and
- Modul: Colloids and Biopolymers (5 LP).

(3) The specialization stage falls into the categories:

- Elective modules in subjects such as chemistry, physics, and engineering, or from the optional elective area of 15 credits and
- Elective modules from Research Projects of 15 credits.

(4) The elective modules are offered to the universities and disciplines involved in the Master's degree as per § 1. They serve to deepen and expand the knowledge and skills acquired in the basic phase

in a field of polymer science (chemistry, physics or polymer technology) and to prepare for the master thesis. The Joint Commission shall provide a timely list of eligible modules. On a justified request, further modules may be approved by the Examination Board.

(5) Research projects are offered in the scientific working groups in the institutes involved in the Master's program in order to gain an understanding of complex modern experimental and theoretical developments in polymer science. The choice of the working group determines the subject area. The Examination Committee decides on research projects outside the participating institutes.

(6) For each module, the module descriptions in Appendix 1 provide information on the content and qualification objectives, the teaching methods, the time required for the course, the forms of active participation, the duration of the course, the frequency of offers and the institution at which the modules are offered. For the "Advanced Macromolecular Chemistry" module, please refer to the study regulations for the Master's degree in Chemistry at the Faculty of Biology, Pharmacy, Chemistry of Freie Universität Berlin. For the modules of other Master's degree programs or areas of study that are selectable in the elective area as per section 4, please refer to the respective study regulations.

(7) The exemplary course of studies in Appendix 2 informs about the recommended progression of the full-time study program.

§ 5 Methods of learning and teaching

The competences acquired in the Master's degree course are imparted by the following methods of learning and teaching:

1. Lectures (V) serve to convey the general contexts and theoretical fundamentals. They deepen the expertise, consolidate the use of the technical terminology and provide advanced concepts and methods of scientific analysis. They deal with the current state of research and also show controversial aspects of current research. The primary teaching method is the lecture of the respective teacher. Lectures may also contain a small portion of exercises.

2. Exercises (Ü) are used - usually in accompany to lectures - to apply the lecture contents to selected, concrete examples, thereby deepening the subject matter of the lecture. They direct the students to self-study by working independently and in groups and discussing critically. The students present their results in the exercise group and thereby have the opportunity to review their learning progress in a

dialogue with the teachers and the group. The primary method of work is solving of exercises and discussion of respective solutions within a group.

3. Seminars (S) serve to discuss scientific and methodological questions and critically deal with polymer science theories, insights and application possibilities. They are used to acquire the skills to work independently, to present the results in an addressee-related manner, to formulate hypotheses, to represent them in an argumentative way, and to discuss them critically in the group. They also tackle current controversies in polymer science research. The primary form of work is the lectures of the students and their discussion with the participants in the seminar.

4. Lab Courses (P) are used to teach practical working methods. They serve in a special way the guided elaboration of questions and solutions and the learning of practical and analytical abilities in experiments carried out by the students themselves. Lab Courses are regularly held in the laboratories of the participating institutes. They contain a supervised part of the time (for example, preliminary and subsequent discussion of the experiments) and a larger proportion of independent study work (for example, the independent practical execution of the experiments, their evaluation and the compilation of the lab reports).

5. Safety-relevant Lab Courses (sP) are Lab Courses requiring the handling of hazardous substances. The interaction with teachers and assistants is intensive, of relatively long duration, often individually or in small groups.

6. Research Projects (FPs) are Lab Courses in which the students work on a demarcated project of current research. In addition to the learning of advanced practical working methods, they serve the independent research-oriented elaboration of questions and problem-solving strategies. Research projects include an extensive part of time for independent studies, such as literature research, the analysis of the scientific problem, the development of a concept for its solution, the independent practical execution of the experiments and the compilation of the results in form of a report and a lecture. The employees of the working groups provide assistance. Interactions with the supervising member of the working group's staff are intensive, of relatively long duration, and take place often individually or in small groups.

§ 6 Student Advisory Service

(1) The general study counseling is carried out by the appropriate center institutions for the study

counseling and psychological counseling of the universities mentioned in § 1.

(2) Each student is assigned a mentor at the start of the studies. The mentor is responsible for providing study counseling and, in particular, supports the choice of modules in the third semester. Mentors belong to the full-time employed scientific staff. In the case of questions related to examination issues, the Chairperson of the Examination Committee shall advise.

§ 7 Study abroad

(1) Completion of parts of the study at a university abroad is recommended. Within the scope of the study abroad, studies and examinations (achievements) are to be taken which are creditable for those modules which should be completed during the same period in the Masters of Polymer Science course. For the compilation of the master thesis and its crediting, please refer to § 5 para. 7 examination regulations.

(2) Prior to study abroad an agreement should be made between the student, the Examination Committee, and the relevant institution at the target university about the duration of the foreign study, the achievements in the course of the study abroad (which have to be equivalent to the achievements in the Master's degree course), as well as about the credit points assigned to the achievements. Achievements in accordance with the agreement will be credited.

(3) The third semester of the Master's degree is recommended as an appropriate time for a stay abroad.

§ 8 Enactment and Transitional Provisions

(1) This regulation shall come into effect on the day following the publication of the Official Communication of the universities pursuant to § 1.

(2) With the coming into force of these regulations the Course and Examinations Regulations for the joint English Language Master of Science in Polymer Science Program of December 7, 2006 and January 11, 2007 (FU-Mitteilungen Nr. 64/2007, Amtliches Mitteilungsblatt der Humboldt-Universität zu Berlin Nr. 64/2007, Amtliches Mitteilungsblatt der Technischen Universität Berlin Nr. 4/2008, Amtliche Bekanntmachungen der Universität Potsdam Nr. 2/2008) become invalid.

(3) This regulation applies to students enrolled in this Master's degree program at the Freie Universität Berlin, the Humboldt-Universität zu Berlin, the Technischen Universität Berlin, or the Universität Potsdam after these regulations take effect. Students who have been enrolled before the entry into force of these regulations for the Master's degree program at the Freie Universität Berlin, the Humboldt-Universität zu Berlin, the Technische Universität Berlin, or the University of Potsdam continue the Master's program according to the examination regulations pursuant to section 2, unless they do not request to the Examination Committee the delivery of achievements pursuant to these regulations. On the occasion of the change of regulation made at the request, the Examination Committee shall decide on the extent to which modules that were already started or completed at the time of the request are taken into account, or on the crediting of such modules considering the requirements of these regulations, allowing for the needs of the protection of confidence and the principle of equal treatment. The decision on the request for change takes effect at the beginning of the lecture period of the semester following the date of the decision. The decision is not revisable.

(4) The possibility of completing the degree on the basis of the examination regulations in accordance with section 2 is guaranteed until the end of the winter term 2016/2017.

Appendix 1: Module descriptions

Explanations:

The following module descriptions name, if not referred to other regulations, for each module of the Master's degree course

- The title of the module
- The person responsible for the module
- Contents and aims of qualification of the module
- Teaching and learning methods of the module
- The time effort (workload) for students estimated to successfully complete the module
- The obligation of regular participation
- The regular duration of the module
- The frequency the module is offered
- The applicability of the module

The information on the time effort (workload) for work takes into account in particular

- The time effort for active participation within the time of presence study
- The time effort for the completion of minor tasks within the time of presence study
- The time effort for independent preparation and review
- The processing of study units in the online study phases
- The immediate preparatory period for examinations
- The examination period itself.

The time efforts given for the self-study (among others preparation and review and preparatory period for examinations) are guideline values and are intended to provide the students with support for the temporal organization of their module-related workload.

The information on the time effort (workload) corresponds to the number of credit points assigned to the respective module as a unit of measure for the student's workload, which is needed approximately for the successful completion of the module.

The active and - if required - regular participation in the teaching and learning forms and the successful completion of the examinations of a module are prerequisite for the acquisition of the credit points assigned to the respective module. In the case of modules without a module examination, active participation, in addition to regular participation in the teaching and learning forms, is a prerequisite for the acquisition of the credit points assigned to the respective module.

The number of credit points as well as other examination-related information for each module are given in Appendix 1 of the Subject-specific Examination Regulations for the joint Master of Science program "Polymer Science".

For the module "Advanced Macromolecular Chemistry" please refer to the study regulations for the Master's degree in Chemistry from the Department of Biology, Chemistry, and Pharmacy of Freie Universität Berlin.

The other modules from the Master's degree program are described as follows:

Module: Introduction to Macromolecular Chemistry			
University / Faculty / Institute: Freie Universität Berlin / Fachbereich Biologie, Chemie, Pharmazie / Institut für Chemie und Biochemie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students have basic knowledge of macromolecular chemistry and their specialized terminology and know the most important polymer classes with their properties and application areas. They are familiar with the various polymerization processes with the underlying reaction mechanisms, applications, and limitations, and the relevant methods for the characterization of polymers.			
Contents: Characterization of polymers with regard to molecular weight, origin, method of synthesis, chemical structure, polymer architecture, characterization of polymerization reactions (step growth, chain growth processes, poly addition, poly condensation) and their kinetics, polymer classes and their chemical structure, their properties and applications (polyester, polyamides, polycarbonates, polyurethanes, poly olefins, poly ethers, co-polymers, biopolymers), production processes (poly condensation, anionic, cationic, radical polymerization, poly insertion, bulk, solution, emulsion and suspension polymerization, polymer-analogous reactions)			
Type	Time (weekly hours = SWS)³	Participation	Time effort (hours)
Lecture (V)	40 hours	-	Presence V 30 Preparation and review 30
Exercise (Ü)	20 hours	discussion	Presence Ü 15 Preparation and review 45 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise: yes.	
Total time effort		150 hours	5 CP
Duration of module		First half of winter semester (block course)	
Frequency		every winter semester	
Applicability		Bachelor of Science, Chemistry; Master of Science, Chemistry; Master of Science, Polymer Science	

³ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Polymer Synthesis and Characterization Laboratory			
University / Faculty / Institute: Freie Universität Berlin / Fachbereich Biologie, Chemie, Pharmazie / Institut für Chemie und Biochemie			
Responsible persons: Lecturers of the module			
Entry requirements: Module "Introduction to Macromolecular Chemistry"			
Aims of qualification: The students can build laboratory equipment for the synthesis of polymers, they are able to conduct polymerization reactions even with the exclusion of oxygen and moisture, and can characterize the products obtained. They can autonomously use simple standard methods of polymer characterization and they can operate more complex characterization setups under instruction. They can document the experiments in writing and interpret the results.			
Contents: Laboratory experiments on polymerization reactions as well as characterization of macromolecules. Topics include: radical polymerization, stereo selective polymerization, block copolymerization, condensation and addition polymerization, size exclusion chromatography (GPC), nuclear magnetic resonance (NMR), infrared spectroscopy (IR), viscometry.			
Type	Time (weekly hours = SWS) ⁴	Participation	Time effort (hours)
Seminar (S)	1	Preiliminary discussion of the experiments	Presence S 15 Preparation and review 15
Safety-relevant Lab Course (sP)	3	Execution of experiments	Presence sP: Supervised lab course 45 Self-study in the laboratory 60 Exam, exam preparation 15
Language		English	
Obligation for regular participation		yes.	
Total time effort		150 hours	5 CP
Duration of module		First half of winter semester (block course)	
Frequency		every winter semester	
Applicability		Master of Science, Polymer Science	

⁴ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Polymer Characterization			
University / Faculty / Institute: Humboldt-Universität zu Berlin, Mathematisch-Naturwissenschaftliche Fakultät I, Institut für Physik			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students are able to specify modern and complex methods for characterization of macromolecules and are able to explain the working principles of the methods. They are able to select methods according to scientific problems and can use them after short familiarization. They are able to analyze the data and review them with respect to the problem to be solved. They know the fundamental underlying physical principles used for the methods.			
Contents: The lecture presents fundamentals of light and interaction of light with media, basic concepts of quantum mechanics, methods to measure molecular masses, scattering methods, structure determination by scattering; mechanical testing, and optical spectroscopy. The seminar is used to explain in more detail experimental methods for characterization of macromolecules (spectroscopy, scattering methods, microscopy, and characterization of surfaces). The lab course comprises experiments using real research apparatuses. Topics are scanning probe microscopy, optical spectroscopy, calorimetry, computer simulation.			
Type	Time (weekly hours = SWS)⁵	Participation	Time effort (hours)
Lecture (V)	2	-	Presence V 30 Preparation and review 30
Exercise (Ü)	1	work on exercises, discussion	Presence Ü 15 Preparation and review 45
Seminar (S)	1	presentation, discussion	Presence S 15 Preparation and review 15
Lab Course (P)	45 hours	experimental work, lab reports	Presence P 45 Preparation and review 75 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise, Seminar, Lab course: yes.	
Total time effort		300 hours	10 CP
Duration of module		second half of winter semester	
Frequency		every winter semester	
Applicability		Master of Science, Polymer Science	

⁵ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Introduction to polymer theory			
University / Faculty / Institute: Humboldt-Universität zu Berlin, Mathematisch-Naturwissenschaftliche Fakultät I, Institut für Physik			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students are able to specify and describe the fundamental concepts of theoretical physics to describe macromolecules, especially linear polymers. They are able to apply methods to describe macromolecular systems in order to interpret experimental data.			
Contents: Introduction into thermodynamics and statistical mechanics, models of chain conformation (ideal chain, excluded volume, worm like chain), polymer melt, polymer solution, networks, rubber elasticity.			
Type	Time (weekly hours = SWS) ⁶	Participation	Time effort (hours)
Lecture (V)	2	-	Presence V 30 Preparation and review 30
Exercise (Ü)	1	work on exercises, discussion	Presence Ü 15 Pre- and postprocessing 45 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise: yes.	
Total time effort		150 hours	5 CP
Duration of module		second half of winter semester	
Frequency		every winter semester	
Applicability		Master of Science, Polymer Science	

⁶ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Polymerization Technology			
University / Faculty / Institute: Technische Universität Berlin, Fakultät III Prozesswissenschaften, Institut für Prozess- und Verfahrenstechnik und Fakultät II Mathematik und Naturwissenschaften, Institut für Chemie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students know the basics for the production of polymers on an industrial scale. They know the process of polymerization reactions, understand the data collection during the reactions and can evaluate and interpret kinetic data. They have knowledge about the thermodynamics of polymer solutions and the models for phase equilibria. They can apply methods for calculating the composition of equilibrium phases.			
Contents: Types and methods of polymerization reactions, kinetics of polymerization, process management. Thermodynamics of polymer solutions (phase equilibria, thermodynamic models of phase equilibria), multi-component systems. Experiments on viscosity, calorimetry, thermal degradation, and general measurement techniques.			
Type	Time (weekly hours = SWS) ⁷	Participation	Time effort (hours)
Lecture (V)	4	-	Presence V 60 Preparation and review 70
Exercise (Ü)	1	work on exercises, discussion	Presence Ü 15 Preparation and review 30
Lab Course (P)	45 hours	experimental work, lab reports	Presence P 45 Preparation and review 20 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise, Lab course: yes.	
Total time effort		270 hours	9 CP
Duration of module		first half of summer semester	
Frequency		every summer semester	
Applicability		Master of Science, Polymer Science	

⁷ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Polymer Processing and Surface Science of Polymers			
University / Faculty / Institute: Technische Universität Berlin, Fakultät III Prozesswissenschaften, Institut für Prozess- und Verfahrenstechnik und Fakultät II Mathematik und Naturwissenschaften, Institut für Chemie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students know the basics of rheology and polymer processing. They have knowledge about the most important interfacial phenomena of polymer systems. They know the theoretical description of the interfacial phenomena and can explain their importance for technical applications.			
Contents: Mechanical and rheological properties of polymer materials, stress-strain diagrams, viscoelasticity, description of rubber; surface properties of polymer materials, thin polymer films, adsorption of polymers at interfaces, biocompatible polymers.			
Type	Time (weekly hours = SWS) ⁸	Participation	Time effort (hours)
Lecture (V)	3	-	Presence V 45 Preparation and review 20
Lab Course (P)	1	experimental work, lab reports	Presence Ü 15 Preparation and review 40
Exercise (Ü)	1	work on exercises, discussion	Presence P 15 Preparation and review 15 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise, Lab course: yes.	
Total time effort		180 hours	6 CP
Duration of module		first half of summer semester	
Frequency		every summer semester	
Applicability		Master of Science, Polymer Science	

⁸ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Functional Polymers and Colloids			
University / Faculty / Institute: Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students understand the fundamental physical and technical properties of polymers and can relate them to electrical, optical, electromechanical and optoelectronic applications. They know the basic theoretical and experimental concepts of colloid science.			
Contents: Dielectric relaxation, ferro-, pyro- and piezoelectricity, non-linear optical properties, conjugated polymers, electroluminescence, photovoltaics; colloidal systems, DLVO theory, applications.			
Type	Time (weekly hours = SWS) ⁹	Participation	Time effort (hours)
Lecture (V)	3	-	Presence V 45 Preparation and review 30
Exercise (Ü)	1	work on exercises, discussion	Presence Ü 15 Preparation and review 30 Exam, exam preparation 30
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise: yes.	
Total time effort		150 hours	5 CP
Duration of module		second half of summer semester	
Frequency		every summer semester	
Applicability		Master of Science, Polymer Science	

⁹ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Physical and Technical Applications of Polymers			
University / Faculty / Institute: Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: Polymers and can establish the relationship to the application. They are able to produce active mechanical, electrical and photonic components in simple laboratory setups, to describe their function and to test them experimentally. They can present the results in a professional manner and present more complex problems of current research after a short introduction before the public.			
Contents: Special topics of physical and technical applications of polymers: dielectric spectroscopy, electrical poling of polymers, elastomers, optical fibers, special topics of physical and technical applications of polymers, polymer-based electroluminescence and photovoltaics.			
Type	Time (weekly hours = SWS) ¹⁰	Participation	Time effort (hours)
Lab Course (P)	3	experimental work, lab reports	Presence P 45 Preparation and review 60
Seminar (S)	1	Presentation and discussion	Presence S 15 Preparation and review 15 Exam, exam preparation 15
Language		English	
Obligation for regular participation		Lecture: recommended; Exercise: yes.	
Total time effort		150 hours	5 CP
Duration of module		second half of summer semester	
Frequency		every summer semester	
Applicability		Master of Science, Polymer Science	

¹⁰ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Colloids and Biopolymers			
University / Faculty / Institute: Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students have knowledge about the structure and properties of biopolymers and can relate structure with properties for specific examples. They know the basic methods for the analysis of colloidal systems, can apply these techniques according to their needs and evaluate the results in a professional manner. They have basic knowledge for the production of dispersions. They can present more complex problems of current research after a short training period in front of an audience			
Contents:			
Type	Time (weekly hours = SWS)¹¹	Participation	Time effort (hours)
Lecture (V)	1	-	Presence V 15 Preparation and review 15
Seminar (Ü)	1	Presentation and discussion	Presence S 15 Preparation and review 15
Safety-relevant Lab Course (sP)	3	experimental work, lab reports	Presence sP: Supervised lab course 45 Self-study in the laboratory 15 Exam, exam preparation 30
Language	English		
Obligation for regular participation	Lecture: recommended; Seminar, Safety-relevant Lab Course: yes.		
Total time effort	150 hours		5 CP
Duration of module	Second half of summer semester		
Frequency	every summer semester		
Applicability	Master of Science, Polymer Science		

¹¹ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Research Project A			
University / Faculty / Institute: Freie Universität Berlin/Fachbereich Biologie, Chemie, Pharmazie/Institut für Chemie und Biochemie; Humboldt-Universität zu Berlin Mathematisch-Naturwissenschaftliche Fakultät I, Institut für Physik; Technische Universität Berlin, Fakultät III Prozesswissenschaften, Institut für Prozess- und Verfahrenstechnik und Fakultät II Mathematik und Naturwissenschaften, Institut für Chemie; Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students know the scientific methodology in the research of the respective working group. They can work on problems of the current state of research on a scientific level they can present their research results orally and in written form according to established standards of the subject. They integrate into a research group, which is usually composed of employees with clearly different cultural backgrounds. They are able to work constructively in an international team, taking gender and diversity aspects into account			
Contents: Under the supervision of members of the working group, the students are working on a current project from the research areas of the supervising working group. This includes the research of the scientific background, the practical work on the project, the presentation and critical discussion of the results in the research seminar of the working group - as a rule in English - and the written documentation of the project.			
Type	Time (weekly hours = SWS) ¹²	Participation	Time effort (hours)
Seminar (S)	5 hours	Presentation and discussion	Presence S 5 Preparation and review 5
Research Project (FP)	2	Experimental work, lab report	Presence FP: Supervised lab course 30 Self-study in the laboratory 70 Preparation and review 15 Exam, exam preparation 25
Language		English (German, where appropriate)	
Obligation for regular participation		yes	
Total time effort		150 hours	5 CP
Duration of module		Four weeks full day; while at the same time attending other lectures, the duration is extended accordingly	
Frequency		every semester by arrangement	
Applicability		Master of Science, Polymer Science	

¹² The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Research Project B			
University / Faculty / Institute: Freie Universität Berlin/Fachbereich Biologie, Chemie, Pharmazie/Institut für Chemie und Biochemie; Humboldt-Universität zu Berlin Mathematisch-Naturwissenschaftliche Fakultät I, Institut für Physik; Technische Universität Berlin, Fakultät III Prozesswissenschaften, Institut für Prozess- und Verfahrenstechnik und Fakultät II Mathematik und Naturwissenschaften, Institut für Chemie; Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students know the scientific methodology in the research of the respective working group. They can work on problems of the current state of research on a scientific level they can present their research results orally and in written form according to established standards of the subject. They integrate into a research group, which is usually composed of employees with clearly different cultural backgrounds. They are able to work constructively in an international team, taking gender and diversity aspects into account			
Contents: Under the supervision of members of the working group, the students are working on a current project from the research areas of the supervising working group. This includes the research of the scientific background, the practical work on the project, the presentation and critical discussion of the results in the research seminar of the working group - as a rule in English - and the written documentation of the project.			
Type	Time (weekly hours = SWS) ¹³	Participation	Time effort (hours)
Seminar (S)	5 hours	Presentation and discussion	Presence S 10 Preparation and review 10
Research Project (FP)	2	Experimental work, lab report	Presence FP: Supervised lab course 45 Self-study in the laboratory 155 Preparation and review 30 Exam, exam preparation 50
Language		English (German, where appropriate)	
Obligation for regular participation		yes	
Total time effort		300 hours	10 CP
Duration of module		Eight weeks full day; while at the same time attending other lectures, the duration is extended accordingly	
Frequency		every semester by arrangement	
Applicability		Master of Science, Polymer Science	

¹³ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Module: Research Project C			
University / Faculty / Institute: Freie Universität Berlin/Fachbereich Biologie, Chemie, Pharmazie/Institut für Chemie und Biochemie; Humboldt-Universität zu Berlin Mathematisch-Naturwissenschaftliche Fakultät I, Institut für Physik; Technische Universität Berlin, Fakultät III Prozesswissenschaften, Institut für Prozess- und Verfahrenstechnik und Fakultät II Mathematik und Naturwissenschaften, Institut für Chemie; Universität Potsdam, Mathematisch-Naturwissenschaftliche Fakultät, Institut für Chemie und Institut für Physik und Astronomie			
Responsible persons: Lecturers of the module			
Entry requirements: none			
Aims of qualification: The students know the scientific methodology in the research of the respective working group. They can work on problems of the current state of research on a scientific level they can present their research results orally and in written form according to established standards of the subject. They integrate into a research group, which is usually composed of employees with clearly different cultural backgrounds. They are able to work constructively in an international team, taking gender and diversity aspects into account			
Contents: Under the supervision of members of the working group, the students are working on a current project from the research areas of the supervising working group. This includes the research of the scientific background, the practical work on the project, the presentation and critical discussion of the results in the research seminar of the working group - as a rule in English - and the written documentation of the project.			
Type	Time (weekly hours = SWS)¹⁴	Participation	Time effort (hours)
Seminar (S)	5 hours	Presentation and discussion	Presence S 15 Preparation and review 15
Research Project (FP)	2	Experimental work, lab report	Presence FP: Supervised lab course 60 Self-study in the laboratory 240 Preparation and review 45 Exam, exam preparation 75
Language		English (German, where appropriate)	
Obligation for regular participation		yes	
Total time effort		450 hours	15 CP
Duration of module		Twelve weeks full day; while at the same time attending other lectures, the duration is extended accordingly	
Frequency		every semester by arrangement	
Applicability		Master of Science, Polymer Science	

¹⁴ The actual weekly hours are two times the weekly hours given, because the module lasts only half a semester.

Appendix 2: Exemplary progression of the Master's program

Semester	Half semester	Module and study phase		University	
1. (30 CP)	1.	Basic phase	Introduction to Macromolecular Chemistry (5 CP)		FU
			Advanced Macromolecular Chemistry (5 CP)		
			Polymer Synthesis and Characterization Laboratory (5 CP)		
	2.		Polymer Characterization (10 CP)		HU
			Introduction to Polymer Theory (5 CP)		
2. (30 CP)	1.	Polymerization Technology (9 CP)		TU	
		Polymer Processing and Surface Science of Polymers (6 CP)			
	2.	Functional Polymers and Colloids (5 CP)		UP	
		Physical and Technical Applications of Polymers (5 CP)			
		Colloids and Biopolymers (5 CP)			
3. (30 CP)		Specialization phase	Research Projects (in total 15 CP)	Elective modules (in total 15 CP)	FU, HU, TU, or UP
4. (30 CP)		Master's thesis	Master's thesis work and presentation (defense) (30 CP)		FU, HU, TU, or UP

Shortcuts:

FU: Freie Universität Berlin
 HU: Humboldt-Universität zu Berlin
 TU: Technische Universität Berlin
 UP: Universität Potsdam

Subject-specific Examination Regulations

for the joint Master of Science program “Polymer Science

Based on § 74 of the law for Berlin universities (Berliner Hochschulgesetz - BerlHG) in the new version issued on July 26, 2011 (GVBl. S. 378) in connection with § 14 Sec. 1 Nr. 2 Teilgrundordnung (Erprobungsmodell) of Freie Universität Berlin of October 27, 1998 (FU-Mitteilungen Nr. 24/1998) and § 23 of Verfassung der Humboldt-Universität zu Berlin vom 28. June 2011 (Amtliches Mitteilungsblatt der Humboldt-Universität zu Berlin Nr. 16/2011) und § 18 Sec. 1 Nr. 1 of Grundordnung der Technischen Universität Berlin (Amtliches Mitteilungsblatt der Technischen Universität Berlin Nr. 2/2006) as well as § 18 Sec. 1, 2; § 21 Sec. 1, 2 in connection with § 69 Sec. 1 page 2 und § 70 Sec. 2 Nr. 1 of Brandenburgisches Hochschulgesetzes (BbgHG) of Dezember 18, 2008 (GVBl. I S. 318), last amended on February 11, 2013 (GVBl.I/13, [Nr. 04]), in connection with Article 21 Sec. 2 Nr. 1 of Grundordnung der Universität Potsdam of December 17, 2009 (Amtliche Bekanntmachungen der Universität Potsdam Nr. 4/2013, S. 116) the Joint Commission of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin, the Faculty of Mathematics and Natural Sciences of the Humboldt-Universität zu Berlin, the Faculty of Mathematics and Natural Sciences and the Faculty of Process Sciences and Engineering of the Technische Universität Berlin, as well as the Faculty of Mathematics and Natural Sciences of the Universität Potsdam issued on June 7, 2013 the following examination regulations for the joint Master of Science in Polymer Science Program:¹⁵

§ 1 Scope of application

§ 2 Examination Committee

§ 3 Designated period of study

§ 4 Scope of requirements

§ 5 Master thesis

§ 6 Retaking examinations

§ 7 Final degree

§ 8 Enactment and Transitional Provisions

Appendix 1: Examinations, entry requirements, obligations for participation, and credit points

Appendix 2: Certificate (sample, English version)

Appendix 3: Degree Certificate (sample, English version)

¹⁵ These regulations (German version only!) were certified by the President of Freie Universität Berlin on August 27, 2013, by the President of Humboldt-Universität zu Berlin on October 22, 2014, by the

§ 1 Scope of application

(1) The present regulations, in addition to the general study and examination regulations (Rahmenstudien- und –prüfungsordnung, RSPO) of the Freie Universität Berlin, lay down requirements and procedures for the provision of achievements for the joint Master of Science in Polymer Science Program of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin, the Faculty of Mathematics and Natural Sciences of the Humboldt-Universität zu Berlin, the Faculty of Mathematics and Natural Sciences and the Faculty of Process Sciences and Engineering of the Technische Universität Berlin, as well as the Faculty of Mathematics and Natural Sciences of the Universität Potsdam.

(2) For modules provided by Humboldt-Universität zu Berlin these regulations are effective in conjunction with the interdisciplinary regulations for admission, courses, and examinations of Humboldt-Universität zu Berlin (ZSP-HU), as amended. For modules provided by the Technische Universität Berlin these regulations are effective in conjunction with the regulations of the general course and examination procedures of the Technische Universität Berlin (AllgStuPO-TU), as amended. For modules provided by Universität Potsdam these regulations are effective in conjunction with the amended version of the general course and exam regulations for non-educational Bachelor and Master programs at the Universität Potsdam (BAMA-O-UP), as amended.

§ 2 Examination Committee

An Examination Committee, established by the Joint Commission of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin, the Faculty of Mathematics and Natural Sciences of the Humboldt-Universität zu Berlin, the Faculty of Mathematics and Natural Sciences and the Faculty of Process Sciences and Engineering of the Technische Universität Berlin, as well as the Faculty of Mathematics and Natural Sciences of the Universität Potsdam, is in charge of the organization

President of Technische Universität Berlin on May 27, 2014, and by the President of Universität Potsdam on February 28, 2014.

of examinations and of all other duties mentioned in the RSPO.

§ 3 Designated period of study

The designated period of study for the Master of Science in Polymer Science program is 4 semesters.

§ 4 Scope of requirements

(1) Within the framework of the Master of Science in Polymer Science program achievements (examination and course achievements) with an overall extent of 120 credit points (CP) have to be accounted for, thereof

1. 60 CP from compulsory modules of the basic stage pursuant to § 4 Sec 2 of the study regulations,
2. 30 CP from elective modules of the specialization stage pursuant to § 4 Sec 3 of the study regulations, and
3. 30 CP from the Master's thesis with defense pursuant to § 5 of these regulations.

(2) The examination requirements for the respective modules, the entry requirements for the modules, the specifications about the obligations for regular attendance to the forms of teaching and studying of the respective modules, as well as the credit points related to the respective modules are presented in appendix 1. For details of the module "Advanced Macromolecular Chemistry" reference is made to the examination regulations of the Master of Science in Chemistry program of the Department Biology, Chemistry and Pharmacy of the Freie Universität Berlin. For the elective modules of the elective range pursuant to § 4 Sec 4 of the study regulations reference is made to the examination regulations of the respective study programs.

§ 5 Master thesis

(1) The Master's thesis consists of a written part that can be composed in German or English and an oral part to be held in German or English language (master defense). The master thesis should demonstrate that the student is able to handle a topic within the field of polymer science at an advanced scientific level independently and is able to adequately present, scientifically classify, and document the results.

(2) Students are admitted at the request of the master thesis if they demonstrate when applying that they

1. have been last matriculated at the Freie Universität Berlin, at the Humboldt-Universität zu Berlin, at the Technische Universität Berlin, or at the Universität Potsdam and
2. have completed successfully modules to an extent of at least 60 CP within this master program.

(3) The application for admittance to the Master's thesis has to be accompanied by verifications of compliance with requirements pursuant to Sec. 2 and additionally a written confirmation by a teaching staff member, who is an authorized examiner, on the willingness to take over the supervision of the Master's thesis. The responsible Examination Committee decides on the application; in case a written confirmation pursuant to sentence 1 is not present the Examination Committee shall appoint a supervisor.

(4) After consulting with the supervisor the Examination Committee assigns the topic of the Master's thesis. Topic and problem have to be defined in such a way that the problem can be completed within the preparation time limit. The issuance shall be put on record.

(5) The preparation time for the Master's thesis is 900 hours; the time period is six months. When a student for good reason was hindered from the handling of the thesis for a time period longer than three months, the Examination Committee shall decide if the Master's thesis has to be newly provided. In case the Examination Committee requires renewed provision of the Master's thesis the examination is considered as not taken.

(6) As the start of the time period, the date of issue of the topic is considered by the Audit Committee. The topic can be returned once within the first six weeks and be deemed as not issued. When submitting the student has to certify in writing that he or she has the Master's thesis written autonomously, and did not use other sources and tools than those specified. The Master's thesis must be submitted in three bound copies and in electronic format, a format that shall be specified by the Examination Committee.

(7) The Master's thesis can be made - with the approval of the Examination Committee - in an institution outside the institutions involved in the Masters Course. In this case, a certificate of an authorized examiner who is full-time employed at one of the universities and faculties participating in the Masters Course in accordance with § 1 about his or her willingness to take over the review of the thesis must be attached. The Examination Committee decides on the request.

(8) The written part of the Master thesis has to be evaluated within four weeks by a written survey by two authorized examiners appointed by the Examination Committee. The supervisor of the master thesis is to be one of the examiners. At least one of the two surveys is to be of an authorized examiner who is employed full time at one of the universities and faculties participating in the Masters Course.

(9) The graded, approximately 30-minute Master's talk (defense) with subsequent discussion takes place in the last third of the time of the master's work in front of the examiners in accordance with paragraph 8. The date for the Master's defense will be determined in agreement with the student. It is recommended to carry out the Master's talk at the end of the lab and before completing the written work. The Master's defense is open to the public only upon approval by the candidate.

(10) The grade for the written part of the Master thesis is derived from the arithmetic mean of the grades of the two examiners. If the difference between the two individual grades is 2.0 or higher, the Examination Committee shall commission a third examiner with an assessment. In this case, the three single grades for the written work are averaged.

(11) The overall grade for the Master's thesis is calculated with the grade for the written part with a weighting of two thirds and the grade of the Master's defense with a weighting of one third.

(12) The Master's thesis is passed if the overall grade for the master thesis is at least "sufficient" (4.0).

§ 6 Retaking examinations

(1) A failed Master's thesis may be repeated once, other examination assignments may be repeated twice.

(2) The deadlines for registration of examination assignments are announced in good time by the Examination Committee.

(3) An examination assignment must be taken, including a first repeat attempt, if necessary, before the beginning of the semester following the respective course. A further repetition must take place no more than one year later. The examination dates will be announced to the students in good time. An examination may be repeated only once in the semester in which the initial attempt has been made.

§ 7 Completion of the studies

(1) Prerequisite for the completion of the studies is that the examination achievements required pursuant to § 4 of the regulations of studies in connection with §§ 4 and 5 of this regulations have been accounted for.

(2) The completion of the studies is excluded if the student has not provided conclusive examination assessments or has pending examination assessments at any university in the same course of studies, or in a module, which is identical to or comparable to one of the modules of this master's program that has to be taken into account for the determination of the overall grade.

(3) The application for completion of the studies has to be accompanied by evidence that the candidate complied with the requirements pursuant to § 7 sentence 1 and a confirmation that none of the cases according to § 7 sentence 2 are relevant for the applicant. The examination committee decides on the application.

(4) On the basis of the examinations passed, the university degree of Master of Science (M.Sc.) is awarded. The students receive a certificate and a certification in English (Annexes 2 and 3), as well as a Diploma Supplement (English and German version). In addition, a certificate supplement is provided with information on the individual modules and their components (transcript). Upon request, German versions of certificate and certification will be handed over.

§ 8 Enactment and Transitional Provisions

(1) This regulation shall come into effect on the day following the publication of the Official Communication of the universities pursuant to § 1.

(2) With the coming into force of these regulations the Course and Examinations Regulations for the joint English Language Master of Science in Polymer Science Program of December 7, 2006 and January 11, 2007 (FU-Mitteilungen Nr. 64/2007, Amtliches Mitteilungsblatt der Humboldt-Universität zu Berlin Nr. 64/2007, Amtliches Mitteilungsblatt der Technischen Universität Berlin Nr. 4/2008, Amtliche Bekanntmachungen der Universität Potsdam Nr. 2/2008) become invalid.

(3) This regulation applies to students enrolled in this Master's degree program at the Freie Universität Berlin, the Humboldt-Universität zu

Berlin, the Technischen Universität Berlin, or the Universität Potsdam after these regulations take effect. Students who have been enrolled before the entry into force of these regulations for the Master's degree program at the Freie Universität Berlin, the Humboldt-Universität zu Berlin, the Technische Universität Berlin, or the University of Potsdam provide achievements according to the examination regulations pursuant to section 2, unless they do not request to the Examination Committee the delivery of achievements pursuant to these regulations. On the occasion of the change of regulation made at the request, the Examination Committee shall decide on the extent to which modules that were already started or completed at

the time of the request are taken into account, or on the crediting of such modules considering the requirements of these regulations, allowing for the needs of the protection of confidence and the principle of equal treatment. The decision on the request for change takes effect at the beginning of the lecture period of the semester following the date of the decision. The decision is not revisable.

(4) The possibility of completing the degree on the basis of the examination regulations in accordance with section 2 is guaranteed until the end of the winter term 2016/2017.

Attachment 1: Achievements, access requirements, obligation to participate, credit points

Explanations:

In the following sections, as far as not referred to other regulations, information is given for each module of the Master's degree course about

- the entry requirements to the respective module
- the types of examinations
- the obligations for regular participation
- the credit points assigned to the modules.

As long as the obligation for regular participation is stipulated for the respective teaching and learning form, it is, in addition to the active participation in the teaching and learning methods and the successful completion of the examination of a module, a prerequisite for the acquisition of the credit points assigned to the respective module. For regular participation it is required that at least 85% of the presence time provided in the forms of teaching and learning of a module have been attended. If there is no obligation to participate regularly in a teaching method of a module, the attendance is nevertheless strongly recommended. The determination of obligation for regular attendance by the respective teacher is excluded for teaching and learning forms, for which the participation is only recommended.

The hourly student workload, which is estimated for the successful completion of the module, is decisive for the credit points assigned to a module. Both, attendance times as well as phases of the self-study (preparation and follow-up, preparation for examination, etc.), are taken into account. One credit point corresponds to approximately 30 hours.

For every module the respective examination – as far as one is provided – has to be taken. Modules are completed with only one examination (module exam). The module examination is to be referred to the qualification objectives of the module and exemplarily examines the achievement of the objectives of the module. The scope of the examination is restricted to the necessary extent. In modules where alternative examinations are provided, the examination form of the respective semester must be specified by the responsible teacher at the latest in the first course.

Credit points are booked after successful completion of the entire module, i.e. after regular and active participation in the teaching and learning forms and successful completion of the module examination of the module. In the case of modules without a module examination, active participation, in addition to regular participation in the teaching and learning forms, is a prerequisite for the acquisition of the credit points assigned to the respective module.

Content and qualification objectives of the module, forms of teaching and learning of the module, the student's workload, which is estimated for the successful completion of a module, forms of active participation, the regular duration of the module and the frequency with which the module is offered, are part of Appendix 1 of the Course Regulations for the joint Master of Science program "Polymer Science".

For the module „Advanced Macromolecular Chemistry“ reference is made to the Examination Regulations of the „Masterstudiengang Chemie des Fachbereichs Biologie, Chemie, Pharmazie der Freien Universität Berlin“.

Further information about the other modules of the Master's degree course is given below:

Module: Introduction to Macromolecular Chemistry		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minutes); this module exam is not rated.	Strongly recommended
Tutorial		Yes
Credit points (CP): 5		

Module: Polymer Synthesis and Characterization Laboratory		
Entry requirements: Module „Introduction to Macromolecular Chemistry“		
Teaching methods	Module examination	Obligation for regular attendance
Seminar	Practical examination (Description of theoretical background, results and laboratory journal)	Yes
Laboratory (safety-related)		Yes
Credit points (CP): 5		

Module: Polymer Characterization		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minute)	Strongly recommended
Tutorial		Yes
Seminar		Yes
Laboratory		Yes
Credit points (CP): 10		

Module: Introduction to Polymer Theory		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minute); this module exam is not rated.	Strongly recommended
Tutorial		Yes
Credit points (CP): 5		

Module: Polymerization Technology		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minute)	Strongly recommended
Tutorial		Yes
Laboratory		Yes
Credit points (CP): 9		

Module: Polymer Processing and Surface Science of Polymers		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minute)	Strongly recommended
Laboratory		Yes
Tutorial		Yes
Credit points (CP): 6		

Module: Functional Polymers and Colloids		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Written exam (120 Minute)	Strongly recommended
Tutorial		Yes
Credit points (CP): 5		

Module: Physical and Technical Applications of Polymers		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Laboratory	Practical examination (Description of theoretical background, results and laboratory journal)	Yes
Seminar		Yes
Credit points (CP): 5		

Module: Colloids and Biopolymers		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Lecture	Practical examination (Description of theoretical background, results and laboratory journal); this module exam is not rated.	Strongly recommended
Seminar		Yes
Laboratory (safety-related)		Yes
Credit points (CP): 5		

Module: Research Project A		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Seminar	Written documentation of results (Lab report, 15-40 pages)	Yes
Research Laboratory		Yes
Credit points (CP): 5		

Module: Research Project B		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Seminar	Written documentation of results (Lab report, 20-60 pages)	Yes
Research Laboratory		Yes
Credit points (CP): 10		

Module: Research Project C		
Entry requirements: none		
Teaching methods	Module examination	Obligation for regular attendance
Seminar	Written documentation of results (Lab report, 25-80 pages)	Yes
Research Laboratory		Yes
Credit points (CP): 15		