Module P 201: Polymer Architectures

Learning objectives:

This module will enable the student to design polymers with well-defined structures, based on living/controlled polymerization techniques. The students will learn the solution and bulk properties of polymers with selected architectures.

Course units and temporal allocation:

Module P 201 ‚Polymer Architectures' is comprised of the following course units:

	HPW	Semester
Lecture	2	SS
Laboratory Course	8	SS

This module will be offered by lecturers of Macromolecular Chemistry

Course content:

The ***lecture*** consists of two parts. In the first part the mechanisms of living/controlled polymerizations (anionic, cationic, radical, coordinative, ring-opening) will be discussed in great detail. The second part will cover Macromolecular Engineering, i.e. the synthesis and properties of various polymer architectures will be discussed in detail, e.g. block and graft copolymers, star-branched and hyperbranched polymers, organic and hybrid nanoparticles.

The associated ***laboratory course*** will be performed in one of the macromolecular chemistry research groups in collaboration with PhD students and post-docs. It will cover the synthesis and characterization of given polymer structures.

Entrance requirements:

Participation in P101 (Polymer Synthesis) and P102 (Physical Chemistry of Polymers) is recommended.

Assessment:

An oral (or written) examination on the contents of the lecture after the second semester. This examination will amount to 50 % of the grade. The laboratory course will be evaluated by the average of three independent grades: Practical performance, written report, and a seminar and amount to 50 % of the grade.

Work load:

In addition to the 2 HPW for the lecture 2 hours are planned for individual studies. Accordingly, 4 additional hours are necessary for the preparation of the experiments and the protocol of the 8 HPW laboratory course. Given 15 weeks per semester this adds up to 240 hours. Together with 30 hours for the preparation of the final examination a work load of 270 hours for the whole semester is calculated.

ECTS Credit Points: 9