Name of the course	**Structure and processing of polymer materials**
Number of instruction hours	20
Outline of course/module content	Overview of polymer materials. Thermosets, elastomers and plastomers. Static and dynamic structure of polymers. Deformation states of plastomers , thermosets and elastomers. Viscoelasticity, deformation of fluids and solids. The effect on the processing characteristics of polymeric materials and application properties of products.The influence of the processing parametars and materials on rheological behavior, heat transfer, and properties of the products in certain processes. Degradation in polymer production and processing . Processing parametars, the processing conditions on the stability of polymer material and polymeric products. Stability under the influence of external and internal factors. 1. BASIC COCEPTS. Characteristics of polymer structure. Structure units and elements. 2. MICROSTRUCTURE. Macromolecule: constitution, configuration, and conformation. Macromolecular packing. Crystal structure. Mesostructure. Amorphous structure. 3. SUPERMOLECULARE STRUCTURE (SMS). Basic SMS characteristics and levels. Global conformations of isolated and condensed macromolecules. Crystallization. Structural order in polymers. Defects and paracrystallinity. Degree of crystallinity. Crystallite size. 4. SMS OF ISOTROPIC POLYMERS. Morphological models of semicrystalline polymers. Monocrystal: structural models of chains packing. Transition forms. Spherulites. Structure of bulk polymers. Annealing. Mesomorphous polymers. Amorphous polymers. 5. SMS OF ORIENTED, ANISOTROPIC POLYMERS. Anisotropic crystallization. Morphological characteristics. Deformation mechanisms of condensed polymers. Structural models of fibres. Hierarchy of structure elements. Annealing. 6. NANO-, MICRO-, AND MACROPHASE STRUCTURE. Block copolymers. Fibres. Polymer compounds. Polymer blends. Polymer composites. 7. STRUCTURAL TERMINOLOGY OF POLYMERS.
Description of instruction methods	Teaching program is realized by consultations and seminars/lectures.
Description of course/module requirements	Preparation of seminar work. Oral exam.