Subject: **CHEMISTRY OF DENTAL MATERIALS**	Subject type:	**compulsory**
Study year: **1**	Content:	**2/3 WT**
Study program: **Dental Medicine**		

Aim of course

The subject **Chemistry of dental materials** includes selected chapters from general, inorganic and physical chemistry, metal chemistry and chapters on dental materials. The graduate acquires basic skills in chemical calculations and comprehensive information about the physic-chemical properties of materials used in dentistry in the field of conservative dentistry and prosthetics. He will get an overview of the materials used for the treatment of dental caries and the materials used in the prosthetic treatment of the teeth. Knows the composition and properties of materials (e.g., metallic, organic, ceramic) used in dentistry. He will understand the principles of their processing and understand the principles of their practical use. Familiarizes himself with basic technological procedures.

Education: lectures and practical exercises

Assessment: preliminary written tests and a final control test

Syllabus

Structure of the molecules. The formation of chemical bonds and their properties (e.g. covalent bond, coordination bond, metallic bond, hydrogen bond, weak intramolecular interaction). Biological importance of water. Characteristic, types and properties of disperse systems (diffusion and osmosis). The expression of the composition of the solutions. Characterization of electrolytes. Acid-base theory. Autoprotolysis of water, pH, hydrolysis, buffer solutions. Colloid solutions – structure, properties. Classification of chemical reactions. Chemical thermodynamics. Reaction kinetics. Chemical equilibrium. Metals and their alloys. Characteristics of dental materials used in conservative dentistry – chemical, physical, mechanical and biological properties. Preparations for determining and preserving the vitality of the dental pulp. Root filling materials. Metals and their alloys – properties, classification and distribution. Crystallization, phase diagrams. Importance of noble metals for use in dental alloys. Amalgams – composition, meaning, properties and corrosion. Materials used to treat and polish metals. Ceramic materials – composition, properties. Dental porcelain and metal-ceramic systems. Cements – composition, setting reactions. Model materials – production, setting, mixing ratio. Gypsum – composition, properties, indications for use. Macromolecular substances in dentistry – composition, properties and use. Polymerization - basic reactions. The structure of polymer compounds and the possibilities of their modification. Composition and properties of dental waxes. Impression materials – composition, classification, setting reactions. Auxiliary materials used in the production of dental prostheses. Biomaterials – properties and use in medicine.