

Information sheet for the course Applied Organic Chemistry in Material Engineering

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>Faculty of Industrial Technologies in Púchov</i>	
Course unit code: <i>MI-I-P-8</i>	Course unit title: <i>Applied Organic Chemistry in Material Engineering</i>
Type of course unit: <i>compulsory</i>	
Planned types, learning activities and teaching methods: <i>Lecture: 2 hours weekly/26 hours per semester of study; face to face</i> <i>Seminar: 1 hour weekly/13 hours per semester of study; face to face</i> <i>Laboratory tutorial: 0</i>	
Number of credits: <i>4</i>	
Recommended semester: <i>2nd semester in the 1st year full-time</i> <i>2nd semester in the 1st year part-time</i>	
Degree of study: <i>the 2nd degree of study (Engineer's degree)</i>	
Course prerequisites: <i>none</i>	
Assessment methods: <i>Seminar during the semester: 10 control tests (2 points) – acquirement of 10 points from all 20 points. Final valuation (examination): writing part – 36 points from all 60 points, oral part – 25 points from all 40 points. Summary of both parts of examination must be 61 points. It is necessary to obtain minimally 90 points for A valuation, 80 points for B valuation, 75 points for C valuation, 68 points for D valuation and 61 points for E valuation.</i>	
Learning outcomes of the course unit: <i>Student has a complex knowledge about organic materials productions which are fundamental element of organic technologies. Student has a complex knowledge about preparation of large amount of chemical intermediate products for production of plastic materials, fibres, resins, agrochemicals, surfactants and many others chemical products which use the processes based on the transformation of hydrocarbons from oil and natural gas. Student knows coherences and relations between industrially exploited organic reactions (from reaction mechanism up to the examples of technologies) as well as structure and reactivity of functional groups such as carbonyl, carboxyl and their derivates. Student understands the macromolecular substances and organic pigments from aspect of structure, chemical properties, their technical and functional importance.</i>	
Course contents: <i>1. Structural and thermo-dynamical assumptions of substances for their possible application as monomers for preparation of macromolecular substances.</i> <i>2. Fundamental configuration and conformation state of organics.</i> <i>3. Properties, production methods, organic compound requirements from the technical, technical-economic and environmental aspect.</i> <i>4. Oil processing, obtaining of the most important monomers.</i> <i>5. High-capacity and low-capacity selected monomers. Ethene, propene and others polyolefins.</i> <i>6. Lower alkenes C4 – C8 and dienes C4 – C5, cycloalkenes, alkenylhalogenides.</i> <i>7. Acryl and methacrylic monomers and their derivates.</i> <i>8. Vinyl esters and vinyl ethers.</i> <i>9. Allyl and vinyl ethers, cyclic ethers, with an emphasis placed on oxirane, methyl oxirane, epichlorohydrine, dioxolane and trioxane.</i> <i>10. Lactones, lactanes and others cyclic monomers.</i> <i>11. Isocyanates and diisocyanates.</i>	

12. Resins, melamine formaldehyde and urea-formaldehyde resins. Polyurethanes.

Recommended of required reading:

1. Hrivík A.: *Chémia a technológia monomérov*. SVŠT Bratislava, 1989.
2. Maroušek V.: *Chemie a technologie monomerů*. VŠCHT Praha, 2000.
3. Svoboda, J.: *Sbirka příkladů z organické syntézy I*, VŠCHT Praha, 2012.
4. K. Weissermel, H.-J. Arpe: *Industrial Organic Chemistry*, VCH, Weinheim, 2003, ISBN 3-527-26995-9.

Language: Slovak

Remarks: The course is in summer semester.

Evaluation history

Number of students: 76

A	B	C	D	E	FX
14.47	11.84	10.53	22.37	34.21	6.58

Lecturers: doc. Ing. Petra Skalková, PhD., RNDr. Viera Maziková, PhD.

Last modification: 31.03.2014

Supervisor: prof. Ing. Darina Ondrušová, PhD.