

Course title: Basic mechanisms in organic chemistry						
	Specialty	Semester	Number of ECTS	Number of hours in the class	Form	
	Foreign students	winter	1	15	Lecture	
Name of lecturer: Dr. hab. Aneta Szymańska Dr. hab. Elżbieta Jankowska						
Objective of the course (expected learning outcomes and competences to be acquired): To teach basic mechanisms of organic reactions of both ionic and radical nature including the information concerning the reactive intermediates in organic chemistry, basic types of reactions: substitution, elimination and addition in saturated and unsaturated systems; the rules of writing reaction mechanism; predicting the product based on the nature of the intermediate. As a result of the course students will: <ul style="list-style-type: none"> - gain the knowledge of the nature and relative stability (reactivity) of basic organic intermediates, - recognize and name the basic types of organic reactions (substitution, elimination, addition) - propose the type and mechanism of the reaction for the given substrates - draw the basic mechanism of the reaction using proper arrows - predict product(s) of the reaction, assign main and side-products - explain the regio- and stereochemistry of the reaction - design simple synthetic scheme leading to a given compound 						
Prerequisites: Completed courses: General chemistry.						
Teaching methods: <ul style="list-style-type: none"> • Lecture with multimedia presentation 						
Course contents: <ul style="list-style-type: none"> - Reactive intermediates in organic chemistry: carbocations, carboanions, radicals and carbenes (structure, stability and methods of formation) - Mono- and bimolecular nucleophilic substitution (SN1 and SN2) and elimination reactions (E1 and E2) in aliphatic system (nucleophile vs. base, leaving group, transition state, stereochemistry, solvent effect, rearrangements) - Nucleophilic substitution in aromatic system (addition-elimination and benzyne mechanisms) - Nucleophilic substitution and addition in acyl group (reactions of aldehydes, ketones and carboxylic acid derivatives, similarities and differences) - Electrophilic addition to unsaturated systems (alkenes, alkynes, dienes) – regio- and stereoselectivity, rearrangements; - Electrophilic aromatic substitution of benzene and substituted benzene derivatives (halogenation, sulfonation, nitration, Friedel-Crafts acylation and alkylation), mechanisms, substituent effects upon rate and regioselectivity - Reactions of enols and enolates (enolate formation by deprotonation, regioselectivity of deprotonation, aldol condensation, including intramolecular and crossed versions, Claisen condensations and similar reactions, enolate alkylation) - Writing the reaction mechanism - Designing of simple reaction schemes 						
Recommended reading: <ol style="list-style-type: none"> 1. Sykes, P.: <i>A guidebook to mechanism in organic chemistry</i>, Longman Scientific and Technical 2. Wade Jr., L.G.: <i>Organic Chemistry</i>, Pearson 3. Hornback, J.M.: <i>Organic chemistry</i>, Thomson Brooks/Cole 4. Hart, H.; Craine, L.E.; Hart, D.J.: <i>Organic Chemistry</i>, Brooks/Cole, Cengage Learning 						
Assessment methods: <ul style="list-style-type: none"> • End-term test 						
Language of instruction: English						