

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

<b>Predmet:</b>	IZBRANA POGLAVJA IZ POLIMERNEGA INŽENIRSTVA
<b>Course Title:</b>	SELECTED TOPICS IN POLYMER ENGINEERING

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
DR Kemijske znanosti, 3. stopnja	/	1.	1. in 2.
Doctoral programme in Chemical Sciences, 3 <sup>rd</sup> Cycle	/	1 <sup>st</sup>	1 <sup>st</sup> and 2 <sup>nd</sup>

**Vrsta predmeta / Course Type:**

**Univerzitetna koda predmeta / University Course Code:**

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
15	45	/	/	30	60	5

**Nosilec predmeta / Lecturer:**

**Jeziki / Languages:**

**Predavanja / Lectures:**

**Vaje / Tutorial:**

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Študent oziroma kandidat mora imeti predmet opredeljen kot študijsko obveznost.

**Prerequisites:**

The course has to be assigned to the student.

**Vsebina:**

- pregled vsebinskih področij polimerne inženirstva s poudarkom na polimernem reakcijskem inženirstvu ter fenomenološki obravnavi viskoelastičnosti polimernih materialov (predavanja);  
- seminar iz izbranega področja polimerne inženirstva, ki temelji na pregledu strokovne in znanstvene literature;

**Content (Syllabus outline):**

- a review of polymer engineering topics with emphasis on polymer reaction engineering and phenomenological treatment of viscoelasticity of polymer materials will be given by lectures;  
- a seminar from a selected topic from polymer engineering, which is based on scientific and professional literature review;  
- elaboration of a project proposal for a specific process design;

- izdelava predloga raziskovalnega projekta za načrtovanje specifičnega procesa;  
- izdelava predloga raziskovalnega projekta za načrtovanje specifičnega produkta.

- elaboration of a project proposal for a specific product design.

### **Temeljna literatura in viri / Readings:**

Predlagana literatura za pregled vsebinskih področij / Recommended readings for topics review:

- J. M. Asua, Polymer reaction engineering, Blackwell Publishing LTD, Oxford, 2007.
- Hal F. Brinson, L. Catherine Brinson, Polymer Engineering Science and Viscoelasticity. An Introduction, Springer, New York, 2008.

Literatura za seminar / Seminar readings:

Znanstvena literatura s področja polimernega inženirstva, ki se spreminja v skladu z razvojem stroke. Študenti literaturo zbirajo samostojno med študijskim procesom s pomočjo usmerjanja učitelja. / Available scientific and professional literature in the field of polymer engineering. Students will perform a literature research being supported and guided by the lecturer.

### **Cilji in kompetence:**

Podiplomski študenti bodo osvojili poglobljena znanja iz specifičnega področja polimernega inženirstva. Preučili bodo dostopno strokovno in znanstveno literaturo iz izbranega področja in jo kritično ovrednotili. Na osnovi preučene literature in zbranih dostopnih podatkov bodo sposobni načrtovati vsebino raziskovalnega dela in predvideti metode dela ter postaviti raziskovalne cilje.

### **Objectives and Competences:**

Deepening knowledge in specific fields of polymer engineering science. Studying scientific and professional literature in a specific field, critical evaluation of literature. Being able to propose the content of a research project, to suggest research methods and to state its goals.

### **Predvideni študijski rezultati:**

#### Znanje in razumevanje

Študent zna samostojno preučevati znanstveno literaturo s področja polimernega inženirstva. Pridobi poglobljena znanja o izbrani tematiki.

#### Uporaba

Pridobljena znanja in uporabljene pristope je sposoben uporabiti pri samostojnem razvojnem in raziskovalnem delu na področju polimernega inženirstva.

### **Intended Learning Outcomes:**

#### Knowledge and Comprehension

Student comprehends scientific literature in the field of polymer engineering. Gains specific and detailed knowledge on selected topics.

#### Application

Acquired knowledge and used approaches are necessary for independent research and development in the field of polymer engineering.

<u>Refleksija</u> Študent je sposoben samostojno definirati problem, načrtovati vsebino raziskovalnega dela, predvideti metode dela ter postaviti raziskovalne cilje.	<u>Analysis</u> Student is able to define problems, propose the content of a research project, suggest research methods and state its goals.
<u>Prenosljive spretnosti</u> Študent je sposoben kritično analizirati in povezovati literaturne podatke, sintetizirati različna znanja, zagovarjati rezultate ter sodelovati v diskusiji.	<u>Skill-transference Ability</u> Ability to critically interpret and interconnect literature data, to synthesize knowledge, to defend project results and to discuss them.

### Metode poučevanja in učenja:

Uvodi v vsebinske sklope kot predavanja. Večina kontaktnih ur kot seminar. Zahteva tudi veliko dela doma pri pripravi projekta in seminarja. Razprava pri predstavitev seminarjev in projektov – oblikovanje skupine oponentov za vsak projekt posebej.

### Learning and Teaching Methods:

Lectures as introductions to various topic modules. Contact hours in forms of a seminar. Independent work in preparing projects and seminars. Active participation in discussion during project/seminar presentations – formation of a group of opponents for every project.

Delež (v %) /

### Načini ocenjevanja:

Weight (in %)  
**Assessment:**

Predloženo poročilo o projektu delu v pisni obliki.	<b>50</b>	Written project report.
Ustni zagovor projektne naloge.	<b>50</b>	Oral project defence.

### Reference nosilca / Lecturer's references:

- RUČIGAJ, Aleš, ALIČ, Branko, KRAJNC, Matjaž, ŠEBENIK, Urška. Investigation of cure kinetics in a system with reactant evaporation : epoxidized soybean oil and maleic anhydride case study. *European Polymer Journal*, 2014, vol. 52, no. 1, str. 105-116.

- MOHORIČ, Ines, ŠEBENIK, Urška. Anionic ring-opening polymerization of octamethylcyclotetrasiloxane in emulsion above critical micelle concentration. *Polymer*, 2011, vol. 52, no. 5, str. 1234-1240.

- MOHORIČ, Ines, ŠEBENIK, Urška. Semibatch anionic ring-opening polymerization of octamethylcyclotetrasiloxane in emulsion. *Polymer*, 2011, vol. 52, no. 20, str. 4423-4428.

- ŠEBENIK, Urška, KARGER-KOCSIS, József, KRAJNC, Matjaž, THOMANN, Ralf. Dynamic mechanical properties and structure of in situ cured polyurethane/hydrogenated nitrile rubber compounds : effect of carbon black type. *Journal of applied polymer science*, 2012, vol. 125, no. S1, str. E41-E48.

- KAJTNA, Jernej, ALIČ, Branko, KRAJNC, Matjaž, ŠEBENIK, Urška. Influence of hydrogen bond on rheological properties of solventless UV crosslinkable pressure sensitive acrylic adhesive prepolymers. *International journal of adhesion and adhesives*, 2014, vol. 49, no. 1, str. 103-108.