

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

**Predmet:** PRAKTIČNO USPOSABLJANJE  
**Course Title:** PRACTICAL TRAINING

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
VSŠP Kemijska tehnologija, 1. stopnja	/	3.	6.
PSP Chemical Technology, 1 <sup>st</sup> Cycle	/	3 <sup>rd</sup>	6 <sup>th</sup>

**Vrsta predmeta / Course Type:**

obvezni / Mandatory

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

PRUSP

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
/	/	/	/	150	/	5

**Nosilec predmeta / Lecturer:**

prof. dr. Igor Plazl / Dr. Igor Plazl, Full Professor

**Jeziki / Languages:**

**Predavanja / Lectures:** /

**Vaje / Tutorial:** /

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

Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.

**Prerequisites:**

The course has to be assigned to the student.

**Vsebina:**

Pri praksi se študenti seznanijo z zahtevnostjo in kompleksnostjo vodenja industrijskih procesov. Spoznajo, da je za uspešno in varno delo v industriji osnovni pogoj natančno poznavanje vseh faz procesa in podrobna kemijska analiza in druga karakterizacija surovin, intermediatov, procesnih tokov in končnih produktov, kot tudi celovita analiza njegovega delovanja. Uspešnost procesa je pogojena z mnogo dejavniki in za njegovo varno obratovanje je potrebno tako optimalno delovanje posameznih procesnih operacij kot tudi usklajeno delovanje sistema kot celote.

Vsebina prakse se prilagaja konkretnemu mestu kjer se opravlja. Področja na katerih študent lahko opravlja prakso so:

**Content (Syllabus outline):**

During practical training student meets with complexity of management of industrial processes. Student recognizes that: accurate knowledge of all stages of technological process, detailed chemical analysis and other characterization method of raw materials, intermediates and final products, process flows and entire analysis of process operation is essential for successful and safety industrial work. Success of technological process depends on many factors, among them optimal operation of separate process stages and adjustment of overall technological system are most important.

Content of practical training depends on specific working environment. Fields where

- uvajanje v delo inženirja kemijske tehnologije,
- spoznavanje s tehnološkim procesom in industrijsko proizvodnjo,
- sodelovanje pri raziskovalno razvojnih nalogah in planiranju ter načrtovanju izdelkov,
- nadzor proizvodnega procesa,
- vhodna in izhodna kontrola kvalitete surovin in produktov,
- instrumentalna analitika v raziskovalnem in kontrolnem laboratoriju,
- aktivnosti v zvezi z varovanjem okolja in zagotavljanjem varnosti,
- vzdrževanje aparatov, merilnih in regulacijskih sistemov.

student can perform practical training are:

- Introducing to work of chemical engineer
- Collaboration in technological process and industrial production
- Collaboration in research projects, planning and design of final products
- Supervision of technological process
- Instrumental analysis in research and control labs
- Activities for environment protections and to ensure working safety
- Apparatus, measuring and system maintenance

### Temeljna literatura in viri / Readings:

Nabor literature bo študent dobil na mestu opravljanja prakse oziroma jo lahko dobi tudi v knjižnici UL FKKT.

### Cilji in kompetence:

Namen prakse je omogočiti študentom preverjanje posredovanih teoretičnih znanj v okolju v katerem bodo delovali po zaključku študija ter jih nadgradili z znanji, ki so značilna za industrijsko tehnološko okolje in jih ni možno dobiti na šoli. Praksa poteka v povezavi študent – mentor v podjetju ali inštituciji – mentor na fakulteti.

Praktično usposabljanje uvajanja študente v praktično delo in s tem spoznavanje strokovne narave dela ter aktualnih problematik v laboratoriju, industrijski proizvodnji in drugod.

### Objectives and Competences:

Goal of practical training is to give opportunity that student verifies his/her theoretical knowledge, which was gained during study, under working conditions where student may operate after finishing study. Furthermore, to upgrade his/her theoretical knowledge with proficiency, specific for industrial technological practice, which he/her cannot learn during education. Practical training is supervised by industrial mentor (from establishment) and mentor at University.

Practical training introduces student to practical work, technical work profession and actual problems in industrial productions and in laboratory.

### Predvideni študijski rezultati:

#### Znanje in razumevanje

Študent se pri opravljanju praktičnega dela usposobi za povezovanje teoretičnih in praktičnih znanj, ki jih je pridobil pri različnih predmetih med študijem z dejanskimi pogoji v praksi, tj. analiznih laboratorijih in laboratorijih za kontrolo kvalitete, industrijskih obratih. Študent spozna način reševanja posameznega problema, se seznani s tehnološko-tehničnimi parametri, se nauči strokovne komunikacije z drugim člani tima.

### Intended Learning Outcomes:

#### Knowledge and Comprehension

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By realization of practical training student knows how to connect theoretical knowledge, which was gained during education at University and practical experience present in various industrial fields (laboratories for analysis, research and quality control, industrial plants). Student finds a way to solve specific problems, learns about technological process

	parameters, and understands professional communication in team.
<u>Uporaba</u> Praktično usposabljanje razvija pri študentu: sposobnost prenosa teoretičnih znanj na reševanje konkretnih problemov, predstavi sodoben pristop k reševanju inženjerskih problemov, razvija sposobnost za vključevanje v skupinsko delo, sposobnost komuniciranja s sodelavci in strokovnjaki drugih disciplin, kar mu omogoča sodelovanje pri multidisciplinarnih projektih in mu razvija profesionalno etično in okoljsko odgovornost.	<u>Application</u> Practical training develops student's skill: capability to transfer theoretical knowledge on solving concrete problems, student gains contemporary approach to solving engineering problems, student develops the ability to integrate in working team, student gains ability to communicate with fellow workers and experts from other disciplines, which enables to collaborate on multidisciplinary projects and develops ethical and environmental responsibility.
<u>Refleksija</u> Študent je sposoben kritično analizirati in primerjati različne pristope pri reševanju problemov tako na laboratorijskem kot tudi industrijskem nivoju.	<u>Analysis</u> Student is able to compare and critical examines different approaches for solving problems on level of laboratory as well as those at industrial plant.
<u>Prenosljive spretnosti</u> Usposabljanje v konkretnem delovnem okolju mu razvija sposobnost za analitično naravoslovno tehnično vrednotenje dogajanj v praksi.	<u>Skill-transference Ability</u> Practical training in a certain working environment develops student's capability of science and technical evaluation of developments in practice.

#### Metode poučevanja in učenja:

Praksa poteka v izbranem podjetju oziroma drugi inštituciji s katerim je vnaprej podpisana tripartitna pogodba, ki določa pogoje usposabljanja. V podjetju vodi delo študenta, ki mora imeti najmanj 7. stopnjo izobrazbe kemijske ali sorodne smeri.

#### Learning and Teaching Methods:

Practical training takes place in a selected company or institution with which it is signed a tripartite treaty which determines the conditions of training. The company manages the work of a student by mentor, who must have at least 7. education level of the chemical or similar direction.

#### Načini ocenjevanja:

Študent odda dnevnik in sumarno poročilo o praksi. Potrdilo o opravljenem praktičnem usposabljanju z oceno delovnega mentorja v podjetju in fakultetnega mentorja je osnova za oblikovanje ocene.  
Ocenjevalna lestvica: opravljeno - neopravljeno

Delež (v %) /

Weight (in %) /

#### Assessment:

Student submits diary and summary report on practical training. The student obtains a certificate of completion practical training with an assessment of the work of the mentor in the company and assessment of the mentor at Faculty. Grading scale: Done – Failure

#### Reference nosilca / Lecturer's references:

STRNIŠA, Filip, BAJIĆ, Marijan, PANJAN, Peter, PLAZL, Igor, SESAY, Adama Marie, ŽNIDARŠIČ PLAZL, Polona. Characterization of an enzymatic packed-bed microreactor : experiments and modeling. Chemical engineering journal, 2018, 1-40.

MILOŽIČ, Nataša, LUBEJ, Martin, LAKNER, Mitja, ŽNIDARŠIČ PLAZL, Polona, PLAZL, Igor. Theoretical and experimental study of enzyme kinetics in a microreactor system with surface-immobilized biocatalyst. *Chemical engineering journal*, 2017, 313,. 374-381.

PRAŠNIKAR, Anže, URBIČ, Tomaž, PLAZL, Igor. Microscale technology and biocatalytic processes. Part 1, How to minimize the gap between research and industry. *Chimica oggi = Chemistry today*, 2017, 35(3), 18-20.

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