UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	PRAKTIKUM IZ SPLOŠNE KEMIJE
Course Title:	PRACTICAL COURSE IN GENERAL CHEMISTRY

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
VSŠP Kemijska tehnologija, 1. stopnja	**/**	**1.**	**1.**
PSP Chemical Technology, 1st Cycle	**/**	**1st**	**1st**

Vrsta predmeta / Course Type: obvezni / Mandatory

Univerzitetna koda predmeta / University Course Code: KT106

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
/	**/**	**15 SV + 60 LV**	**/**	**/**	**75**	**5**

Nosilec predmeta / Lecturer: doc. dr. Nives Kitanovski / Dr. Nives Kitanovski, Assistant Professor

Jeziki / Languages:

Predavanja / Lectures:	**slovenski / Slovenian**
Vaje / Tutorial:	**slovenski / Slovenian**

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	Prerequisites:
Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.	The course has to be assigned to the student.

Vsebina:	Content (Syllabus outline):
Pri računskih vajah študenti utrjujejo poznavanje kvantitativnega obravnavanja snovi in snovnih sprememb z reševanjem računskih nalog in kvantitativnih kemijskih problemov s poudarkom na stehiometriji. Obseg in nivo pričakovanih veščin in znanja sta določena s predpisanim učbenikom (skripta) Program laboratorijskih vaj se izvede v obliki eksperimentalnih vaj z vsebinami: - osnove varnega dela v laboratoriju - osnovna laboratorijska steklovina in oprema - odmerjanje trdnih in tekočih reagentov (tehtanje, pipetiranje, itd.) - dodajanje trdnih in tekočih reagentov - delo pri sobni temperaturi (npr. mešanje) - delo pri povišani temperaturi (segrevanje)	In numerical exercises students strengthen knowing of the quantitative approach of the substance and material changes with solving numerical tasks and quantitative chemistry problems, with focus on the stoichiometry. The scope and level of expected skills and knowledge are determined by the prescribed textbook (script). Program of laboratory work is conducted in the form of laboratory work content: - The basics of safe work in the laboratory - Basic laboratory glassware and equipment - Dosing of solid and liquid reagents (mass measurements, pipetting, etc.). - Adding solid and liquid reagents - Working at room temperature (eg, mixing)

- delo pri znižani temperaturi (hlajenje) - kristalizacija - navadna destilacija (izbor vaj se lahko spreminja) S seminarskimi vajami se poudari povezanost praktičnega eksperimentalnega dela s teorijo.	- Work at elevated temperature (heating) - Work at reduced temperature (cooling) - crystallization - basic distillation (selection of exercises may vary) The seminar exercises emphasize the integration of practical experimental work with theory.

Temeljna literatura in viri / Readings:

- P. Šegedin, Osnove kemijskega računanja z zbirko nalog, UL Biotehniška fakulteta - Oddelek za lesarstvo, Ljubljana 1996, 149 strani.
- B. Kozlevčar, N. Kitanovski, P. Šegedin, Navodila za vaje iz splošne kemije, študijsko gradivo, UL FKKT, 2013, 27 strani.

Dodatna literatura / additional readings:

- N. Bukovec, J. Brenčič, Kemija za gimnazije 1, srednješolski učbenik, DZS, Ljubljana, 2006, 160 strani.
- J. Brenčič, F. Lazarini, Splošna in anorganska kemija, UL FKKT, Ljubljana 2004, strani 1-239.
- P. Šegedin, Zbirka izpitnih nalog iz kemije, UL Biotehniška fakulteta - Oddelek za lesarstvo, Ljubljana 1995, 65 strani.

Cilji in kompetence:	**Objectives and Competences:**
Študenti spoznajo osnove kvantitativnega obravnavanja snovi in snovnih sprememb (osnove kemijskega računanja s poudarkom na stehiometriji). Pri laboratorijskih vajah je osnovni cilj seznaniti študente z osnovnimi prijemi za delo v laboratoriju. Ob tem je poseben poudarek na osebni varnosti ter varnosti delovnega prostora in okolja.	Students learn about the basics of quantitative treatment of materials and material changes (basic chemical calculation with focus on stoichiometry). The basic aim of laboratory exercises is to pair students with the basic approaches to laboratory work. It has a special emphasis on personal safety, safety of the working space and the environment.

Predvideni študijski rezultati:	**Intended Learning Outcomes:**
<u>Znanje in razumevanje</u> Študenti pri računskih vajah predvsem spoznajo pomen poznavanja in razumevanja osnovnih kemijskih pojmov in zakonitosti pri reševanju nalog in kvantitativnih izzivov s področja kemijskega računanja. Pri laboratorijskih vajah pridobijo osnovno praktično znanje varnega dela v kemijskem laboratoriju in spoznajo osnovna navodila o varnosti in prvi pomoči pri laboratorijskem delu.	<u>Knowledge and Comprehension</u> At numerical exercises students learn especially about the importance of knowing and understanding of basic chemical concepts and principles in problem solving and quantitative challenges in the field of chemical calculations. During laboratory exercises they acquire the basic practical knowledge of safe work in a chemistry lab and learn the basic instructions on safety and first aid at laboratory work.
<u>Uporaba</u> Študenti se seznanijo s postopki in pristopi pri reševanju računskih nalog in problemov in jih znajo uporabiti pri njihovem reševanju. Pri izvedbi osnovnih eksperimentalnih (laboratorijskih) vaj	<u>Application</u> Students meet with the procedures and approach for solving numerical tasks and problems, and are able to use to tackle them. Students are able to choose the appropriate

znajo izbrati ustrezen postopek in ga na pravilen način uporabiti (izvesti).	experimental procedure and use (performed) it in correct way.
Refleksija Študenti so sposobni kritično ovrednotiti izvedene meritve in oceniti dobljene rezultate. Teoretične naloge in kvantitativne probleme so sposobni povezati z eksperimentalnimi nalogami in problemi, s katerimi se srečajo pri laboratorijskih vajah in se tako naučiti povezovanja in razumevanja teorije in prakse.	Analysis Students are able to critically evaluate the performed measurements and assess the obtained results. They are able to connect theoretical challenges and quantitative problems with the experimental tasks and problems that may arise at laboratory work, thus also learn the integration and understanding of theory and practice.
Prenosljive spretnosti Pri predmetu bodo študenti pridobili laboratorijske spretnosti in se urili v reševanju kvantitativnih teoretičnih in eksperimentalnih nalog in problemov ter lahko pridobljene izkušnje in znanje koristno uporabil tudi pri vseh drugih kemijskih predmetih. Varnost pri delu je pomembna vrlina ne le v laboratoriju, temveč pri kakršnikoli dejavnosti.	Skill-transference Ability In this course, students gain laboratory skills and are trained in solving quantitative theoretical and experimental tasks and problems, and may learn experience and knowledge usefully applied in all other chemistry subjects. Safety at work is an important virtue not only in the laboratory but also in any activities.

Metode poučevanja in učenja:	**Learning and Teaching Methods:**
Seminarske vaje in praktične vaje v laboratoriju. Pri seminarskih vajah poteka reševanje računskih stehiometričnih nalog in kvantitativnih kemijskih izzivov s poudarkom na skupinskem delu (sodelovalno učenje). Laboratorijske vaje so zasnovane na delu posameznika (izkustveno učenje), skupinska analiza meritev in kvalitativnih eksperimentov ter njihova razlaga s primerno teorijo.	Seminars and practical exercises in the laboratory. At seminars, the stoichiometric calculation problems are solving along with the quantitative chemical challenges, emphasising teamwork (collaborative learning). Laboratory exercises are based on the work of the individual (experiential learning), group analysis of measurements and qualitative experiments with their interpretation by the relevant theory.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Ustni zagovor laboratorijskih vaj je pogoj za opravljanje pisnega izpita. Pisni izpit (lahko ga nadomestita dva pozitivno ocenjena kolokvija).		

Reference nosilca / Lecturer's references:

- **KITANOVSKI, Nives**, BORSAN, Nataša, KASUNIČ, Marta, FRANCETIČ, Vojmir, POPOVIĆ, Jasminka, DJERDJ, Igor, ROCQUEFELTE, Xavier, REEDIJK, Jan, KOZLEVČAR, Bojan. Chromium coordination compounds with bis(3,5-dimethylpyrazol-1-yl)acetic acid or its anion. Polyhedron, 2014,70, 119-124, [COBISS.SI-ID 1666351]
- **KITANOVSKI, Nives**, GOLOBIČ, Amalija, ČEH, Boris. Synthesis and structural characterization of mono-

and dinuclear Mo(V)-oxo-complexes containing bis(3,5-dimethylpyrazol-1-yl)acetate anion as ligand. Inorg. Chem. Commun., 2011, 14, 276-280. [COBISS.SI-ID 34680069]
- **KITANOVSKI, Nives**, PEVEC, Andrej, KOZLEVČAR, Bojan. Copper(II) coordination compounds with ferulic acid. Polyhedron, 2009, 28, 3642-3646, [COBISS.SI-ID 33287429]