UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	BIOLOŠKO POMEMBNE SPOJINE
Course Title:	BIOLOGICALLY IMPORTANT COMPOUNDS

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
MAG Biokemija, 2. stopnja	**/**	**1.**	**2.**
USP Biochemistry, 2nd Cycle	**/**	**1st**	**2nd**

Vrsta predmeta / Course Type: Izbirni strokovni / elective proffesional

Univerzitetna koda predmeta / University Course Code: BI2I12

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

Nosilec predmeta / Lecturer: prof. dr. Bogdan Štefane / Dr. Bogdan Štefane, Associate 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):
Eterična olja Pomembni viri in glavne sestavine posameznih eteričnih oljih. Lastnosti eteričnih olj (kot so eterično olje bazilike, citrusov, kadulje, evkaliptusa, sivke, rožmarina, klinčkov, konoplje, itd.), izolacija in pretvorbe njihovih glavnih sestavin. **Odoranti in flavoranti** Struktura spojin, ki so odgovorne za specifičen okus in vonj. Uporaba in najpogostejše polsintezne in sintezne poti, ki vodijo do tovrstnih spojin. **Alkaloidi** Sistematika alkaloidov. Pojavnost alkaloidov in njihove lastnosti.	**Essential oils** Important sources and main components of essential oils. Properties of essential oils (for example essential oil of basil, citrus, eukaliptus, lavanda, rosmarin, cloves, cannabis, etc.), isolation and transformations of their main components. **Odorants and flavourings** Structure of compounds responsible for specific taste and smell. The use and the main semi-synthetic and synthetic ways leading to these compounds. **Alkaloids** Systematics of alkaloids. Sources and properties of alkaloids.

Postopki za izolacijo alkaloidov. Uporaba tipičnih alkaloidov v medicinske namene. Polsintezne in sintezne poti najpomembnejših alkaloidov. **Naravni produkti kot spojine vodnice za razvoj sinteznih produktov** • primeri v medicinski kemiji • primeri v sintezni kemiji • primeri v kemiji materialov • primeri v kemiji živil	Isolations of alkaloids. The medicinal use of typical alkaloids. Semi-synthetic and synthetic ways leading to the most important alkaloids. **Natural products as leading compounds in development of synthetic products** • examples in medicinal chemistry • examples in synthetic chemistry • examples in chemistry of materials • examples in food chemistry

Temeljna literatura in viri / Readings:

1. *Modern Alkaloids: Structure, Isolation, Synthesis and Biology*, E. Fattorusso and O. Taglialatela-Scafati eds., Wiley-VHC, Weinheim, Germany, 2008 (nekatera poglavja/some chapters; **50** str. od 641).
2. *Flavours and Fragrances: Chemistry, Bioprocessing and Sustainability*, R. G. Berger ed., Springer, Berlin, Germany, 2007 (nekatera poglavja/some chapters; **100** str. od 621).
3. Titus A. M. Msagati, *Chemistry of Food Additives and Preservatives*, John Wiley & Sons, Oxford, UK, 2013 (nekatera poglavja/some chapters **80** str. od 314).

Cilji in kompetence:	**Objectives and Competences:**
Učna enota prispeva k razvoju naslednih splošnih in specifičnih kompetenc: Študent se seznani z viri in uporabo naravnih spojin, • poznavanje pomembnih virov in lastnosti naravnih produktov, • študent spozna poglavitne polsintezne in sintezne pretvorbe naravnih produktov.	To became familiar with sources and applications of natural compounds • knowing important sources and properties of natural products, • knowing important semi-synthetic and synthetic transformations of natural products.

Predvideni študijski rezultati:	**Intended Learning Outcomes:**
<u>Znanje in razumevanje</u> Študent pozna: • biološko pomembne naravne produkte, • njihove najpogostejše vire, • njihove lastnosti, • uporabo, • glavne polsintezne in sintezne pretvorbe.	<u>Knowledge and Comprehension</u> student is familiar with biologically important natural products: • their sources, • properties, • applications, • main semisynthetic and synthetic transformations.
<u>Uporaba</u> Poznavanje navedene vsebine bo študent lahko uporabil pri svojem nadaljnjem strokovnem razvoju. Pridobljena znanja mu bodo omogočila hitrejši in učinkovitejši pristop	<u>Application</u> Student will be able to use the acquired knowledge during his further professional development. This knowledge will enable him to efficiently resolve the problems in the field of

k reševanju problemov s področij kemije naravnih spojin.	natural compounds.
Refleksija Študent je sposoben načrtovanja izolacije posameznih naravnih produktov, čiščenja in karakterizacije. Sposoben je kritično ovrednotiti rezultate glede na skladnost z literaturnimi opisi.	Analysis Student is capable of planning isolation procedures, purification and characterization of typical natural products. Student can critically evaluate obtained results comparing to literature facts.
Prenosljive spretnosti Študent pridobljene spretnosti in teoretična znanja uporablja pri svojem razvojnem delu, raziskovalnem delu in pri študiju ostalih vsebin na področju kemije in biokemije.	Skill-transference Ability Student can use acquired skills and knowledge during his professional development, research work and study of other subjects concerning chemistry and biochemistry.

Metode poučevanja in učenja:	**Learning and Teaching Methods:**
Predavanja in skupinski projekti.	Lectures, group projects.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisni izpit		**Written exam**

Reference nosilca / Lecturer's references:

- POŽGAN, Franc, **ŠTEFANE, Bogdan**, KIDEMET, Davor, SMODIŠ, Janez, ZUPET, Rok. A new synthetic route towards aliskiren intermediates. *Synthesis*, ISSN 0039-7881, str. 1-8, ilustr. doi: 10.1055/s-0034-1378616. [COBISS.SI-ID 1763375],
- BERANIČ, Nataša, **ŠTEFANE, Bogdan**, BRUS, Boris, GOBEC, Stanislav, LANIŠNIK-RIŽNER, Tea. New enzymatic assay for the AKR1C enzymes. V: PLAPP, Bryce (ur.), et al. *Enzymology and molecular biology of carbonyl metabolism*, (Chemico-Biological Interactions, ISSN 0009-2797, vol. 202, iss. 1/3). Amsterdam: Elsevier, 2013, str. 204-209, ilustr., doi: 10.1016/j.cbi.2012.12.003. [COBISS.SI-ID 30357465],
- SOSIČ, Izidor, MIRKOVIĆ, Bojana, ARENZ, Katharina, **ŠTEFANE, Bogdan**, KOS, Janko, GOBEC, Stanislav. Development of new cathepsin B inhibitors: combining bioisosteric replacements and structure-based design to explore the structure-activity relationships of nitroxoline derivatives. *Journal of medicinal chemistry*, ISSN 0022-2623, 2013, vol. 56, no. 2, str. 521-533, doi: 10.1021/jm301544x. [COBISS.SI-ID 3370865]