

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	OKOLJSKA TVEGANJA IN VARSTVO PRI DELU
<b>COURSE TITLE:</b>	ECOLOGICAL RISKS AND WORK SAFETY

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Varstvo okolja in ekotehnologije, 1. stopnja	/	3.	/
Environmental Protection and Eco-technologies, 1 <sup>st</sup> level	/	3 <sup>rd</sup>	/

**Vrsta predmeta / Course type** Izbirni predmet / Optional subject

**Univerzitetna koda predmeta / University course code:** OTVD

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
20	0	20	/	0	60	3

**Nosilec predmeta / Lecturer:** doc. dr. Samar Al Sayegh Petkovšek

**Jeziki / Predavanja / Lectures:** Slovenski / Slovenian  
**Languages: Vaje / Tutorial:** Slovenski / Slovenian

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

Pogojev ni.

**Prerequisites:**

No formal prerequisites.

**Vsebina:**

Predmet bo osredotočen na pridobitev temeljnih znanj s področja okoljskih tveganj in varstva pri delu.

**Poglavitne teme:**

- a) Predstavitev in definicija okoljskega tveganja.
- b) Predstavitev škodljivih dejavnikov okolja glede na naravo dejavnika:
  - kemični dejavniki tveganja v okolju (organska in anorganska onesnažila; izpostavljenost in vplivi na zdravje);
  - biološki dejavniki tveganja v okolju;
  - fizikalni dejavniki tveganja v okolju (vrste sevanj, hrup).
- c) Predstavitev metode/ postopka za ocenjevanje tveganj:
  - postopek izdelave ocene tveganja;
  - primeri ocenjevanja tveganja za kopenske vretenčarje (mali sesalci) in za zdravje ljudi zaradi izpostavljenosti kovinam in nekaterim drugim onesnažilom (PAHi, pesticidi..);
  - ocenjevanje vpliva onesnaženega zraka na zdravje ljudi.

**Content (Syllabus outline):**

The course will be focused on acquiring basic knowledge in the field ecological risk and work safety.

**Main topics:**

- a) Presentation and definition of ecological risks.
- b) Presentation of harmful environmental factors according to the nature of the factor:
  - chemical risk factors in the environment; (organic and inorganic pollutants, exposure and health effects);
  - biological risk factors in the environment;
  - physical risk factors in the environment (types of radiation, noise).
- c) Ecological risk assessment:
  - ecological risk assessment step process;
  - case studies on ecological risk assessment by using terrestrial vertebrates (small mammals) and on assessment of human health due to exposure to metals and other contaminants (PAHs, pesticides ..);

d) Predstavitev področja varstva pri delu, temeljnih načel, zakonodaje in obveznosti delodajalca (izjava o varnosti z oceno tveganja; preiskave delovnega okolja).

e) Predstavitev zakonodaje in smernic za področje varovanje pred tveganji zaradi:

- dela z nevarnimi kemičnimi snovmi, (primer ocene tveganja zaradi izpostavljenosti prahu na delovnem mestu);
- izpostavljenosti rakotvornim in mutagenim snovem, azbestu, biološkim dejavnikom in vibracijam.

- epidemiologic studies regarding chronic exposure to air pollutants.

d) Presentation in the field health and safety at work, basic fundamental principles, legislation and obligations of the employer (statement on safety with risk assessment at work; investigation of the working environment).

e) Presentation of legislation and guidelines for the field the protection of workers from risks related to:

- exposure to chemical substances at work;
- exposure to carcinogenic and mutagenic substances, asbestos, biological agents and vibrations.

### Temeljni literatura in viri / Textbooks:

1. Suter II, G. W., *et al.*, 2016. Ecological Risk Assessment (2<sup>nd</sup> Edition). CRC Press.
2. Praktične smernice za mejne vrednosti za nevarne kemične snovi. Ministrstvo za delo, družino in socialne zadeve, 2006.
3. Likar, M., 1998. Vodnik po onesnaževalcih okolja. Zbornica sanitarnih tehnikov in inženirjev Slovenije.
4. Guidelines for Ecological Risk Assessment, 1998. EPA/630/R-95/002F.
5. Relevantna zakonodaja s področja varstva pri delu / Relevant law and bylaw documents.

### Cilji in kompetence:

**Predmetno specifični cilji in kompetence:**

- študente seznaniti z nekaterimi najpomembnejšimi škodljivimi dejavniki v okolju in z metodami za ocenjevanje okoljskih tveganj;
- študenti bodo usposobljeni za prepoznavanje okoljskih tveganj in tveganj za zdravje;
- študenti bodo usposobljeni za izvajanje nalog na področju ocene tveganji in varstva pri delu.

**Splošne kompetence:**

- sposobnost analize, sinteze in obvladovanja strokovnih metod/tehnike s področja varstva pri delu in izdelave ocen tveganj.

### Objectives and competences:

**Specific competences:**

- to acquaint students with the most significant harmful environmental factors and with methods for ecological risks assessment;
- students will be qualified for recognizing ecological risks and human health risks;
- students will be qualified for executing different issues on the field health and safety at work.

**General competences:**

- ability to analyse, synthesize, and to employ expert methods/techniques on the field health and safety at work.

### Predvideni študijski rezultati:

**Znanje in razumevanje:**

Študent bo ob zaključku predmeta sposoben:

- prepoznati najpomembnejše škodljive dejavnike okolja;
- razlikovati med škodljivimi dejavniki tveganj glede na naravo dejavnika in vir izpostavljenosti;
- razumeti pomen ocenjevanja tveganj;
- uporabiti pridobljeno znanje s področja varstva pri delu za vodenje postopka in sodelovanje pri izdelavi izjave o varnosti z oceno tveganja pri delu in preiskave delovnega okolja.

### Intended learning outcomes:

**Knowledge and understanding:**

At the end of the subject, student will be able to:

- to recognize the most harmful environmental factors;
- to differentiate between harmful environmental factor according to the nature of the factor and the source of exposure;
- to understand the importance of risk assessment;
- to use acquired knowledge in the field health and safety at work for conduct the process and to participate in the preparation of the safety statement with risk assessment at work and for investigation of the working environment.

<p><b>Prenosljive/ključne spretnosti in drugi atributi:</b></p> <ul style="list-style-type: none"> <li>• sposobnost uporabe relevantne nacionalne in evropske zakonodaje;</li> <li>• sposobnost sodelovanja pri postopkih izdelave in sprejetju izjave o varnosti z oceno tveganj in preiskavi delovnega okolja;</li> <li>• sposobnost vrednotenja podatkov o preiskavah delovnega okolja in sodelovanja pri pripravi ukrepov za zagotavljanja varnosti in zdravja na delovnem mestu.</li> </ul>
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<p><b>Transferable/key skills and other attributes:</b></p> <ul style="list-style-type: none"> <li>• ability to use Slovene and foreign literature;</li> <li>• ability to participate in preparation the safety statement with risk assessment at work and in investigation of the working environment;</li> <li>• ability to evaluate the results of investigation of the working environment and participation in the preparation of measures to ensure safety and health at the workplace.</li> </ul>
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**Metode poučevanja in učenja:**

<p><b>Oblike dela:</b></p> <ul style="list-style-type: none"> <li>• predavanja</li> <li>• samostojno delo študentov</li> <li>• seminarske vaje (z vključevanjem strokovnjakov iz prakse)</li> </ul> <p><b>Metode dela:</b></p> <ul style="list-style-type: none"> <li>• razlaga</li> <li>• dialog, diskusija</li> <li>• preučevanje praktičnih primerov</li> </ul>
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**Learning and teaching methods:**

<p><b>Forms of teaching:</b></p> <ul style="list-style-type: none"> <li>• in-class lectures</li> <li>• individual work of students</li> <li>• tutorials (provided by invited guest lectures, i.e. experts from the practice)</li> </ul> <p><b>Teaching methods:</b></p> <ul style="list-style-type: none"> <li>• explanation</li> <li>• discussion, debate</li> <li>• presentation and discussion on case studies.</li> </ul>
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<b>Načini ocenjevanja:</b>	<b>Delež (v %) / Weight (in %)</b>	<b>Assessment:</b>
<p>Pisni izpit.</p> <p>Vprašanja na izpitu se nanašajo na snov, podano na predavanjih.</p> <p>Končna ocena pri predmetu je sestavljena samo iz ocene pisnega izpita.</p> <p>Ocenjevalna lestvica:</p> <ul style="list-style-type: none"> <li>▪ zadostno 6: 60–67 %</li> <li>▪ dobro 7: 68–75 %</li> <li>▪ prav dobro 8: 76–83 %</li> <li>▪ prav dobro 9: 84–90 %</li> <li>▪ odlično 10: 91–100 %</li> </ul>	<b>100</b>	<p>Written examination.</p> <p>Questions for the exam are in relation to material delivered in lectures.</p> <p>Final evaluation consists of the mark for written exam only.</p> <p>Grading system:</p> <ul style="list-style-type: none"> <li>▪ Sufficient D (6): 60–67%</li> <li>▪ Good C (7): 68–75%</li> <li>▪ Very good B (8): 76–83%</li> <li>▪ Very good B+ (9): 84–90%</li> <li>▪ Excellent A (10): 91–100%</li> </ul>

**Materialni pogoji za izvedbo predmeta :**

<ul style="list-style-type: none"> <li>• Predavalnica z multimedijско opremo.</li> </ul>
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**Material conditions for subject realization:**

<ul style="list-style-type: none"> <li>• Classroom with the multimedia equipment.</li> </ul>
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**Obveznosti študentov:**

<p>75 % prisotnost na seminarskih vajah.</p> <p>Pozitivno opravljen izpit.</p>
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**Student's commitments:**

<p>75% attendance at tutorials.</p> <p>Positive mark at the exam.</p>
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**Reference nosilca predmeta:**

**Al Sayegh Petkovšek, S.,** Kopusar, N., Mikuž, B., 2013. Izdelava poročila o oceni kakovosti zraka na delovnih mestih v Luki Koper za projekt SAFEPOR. ERICo Velenje, DP 42/02/13.

**Al Sayegh Petkovšek, S.,** Mazej Grudnik, Z., Orešnik, K., Jelenko, I., Iršič A., 2012. Ocena ranljivosti za okolje Šaleške doline. ERICo Velenje, DP 17/02/12.

**Lecturer's references:**

**Al Sayegh Petkovšek, S.,** Kopusar, N., Mikuž, B., 2013. Assessment of air quality at workplaces in Luka Koper for the SAFEPOR project, report. ERICo Velenje, DP 42/02/13.

**Al Sayegh Petkovšek, S.,** Mazej Grudnik, Z., Orešnik, K., Jelenko, I., Iršič A., 2012. Assessment of vulnerability to the environment of the Šaleška valley. ERICo Velenje, DP 17/02/12.

**Al Sayegh Petkovšek, S.,** Kopusar, N., Pokorny, B., Tome, D., Kryštufek, B., 2017. Transfer of metals from soil to tissues of selected free-living animals: a case study for Veliki Vrh. *Acta silvae et ligni*, 114: 1-20.

**Al Sayegh Petkovšek, S.,** Kopusar, N., Tome, D., Kryštufek, B., 2015. Risk assessment of metals and PAHs for receptor organisms in differently polluted areas in Slovenia. *Science of the Total Environment*, vol. 532, str. 404-414.

**Al Sayegh Petkovšek, S.,** Mazej Grudnik Z., Pandics T., Paldy, A., 2014. Assessment of health effects of ozone, PM2.5 and PM10 in the Šalek Valley (Slovenia) in comparison with selected Central European areas. *Central European Journal of Occupational and Environmental Medicine*, vol. 20 (1-2): 103-118.

**Al Sayegh Petkovšek, S.,** Mazej, Z., Pokorny, B., 2012. Heavy metals and arsenic concentrations in ten fish species from the Šalek lakes (Slovenia): assessment of potential human health risk due to fish. *Environmental monitoring and assessment*, vol. 184, no. 5, str. 2647-2662.

**Al Sayegh Petkovšek, S.,** Tome, D., Pokorny, B., 2010. Risk assessment of lead contamination for small mammal food chains (case study for shooting ranges). *Zbornik gozdarstva in lesarstva*, let. 91, str. 13-30.