

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	OKOLJSKA TVEGANJA
Course Title:	ENVIRONMENTAL RISK

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
MAG Tehniška varnost, 2. stopnja	/	2.	3.
USP Technical Safety, 2 nd Cycle	/	2 nd	3 rd

Vrsta predmeta / Course Type: obvezni / Mandatory

Univerzitetna koda predmeta / University Course Code: TV2A3

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
45	15	15 SV	/	/	75	5

Nosilec predmeta / Lecturer: izr. prof. dr. Andreja Žgajnar Gotvajn /
Dr. Andreja Žgajnar Gotvajn, Associate Professor
doc. dr. Mitja Kožuh / Dr. Mitja Kožuh, Assistant Professor

Jeziki / Languages:

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

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.
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Vsebina:

Evropska in slovenska zakonodaja na področju voda, zraka in tal. Zakonodaja na področju okolju prijaznih tehnologij, okoljski ISO standardi, IPPC smernica. Seveso smernica. Okoljska tveganja ter metodologije za identifikacijo okoljskih tveganj. Okoljske nezgode in njihove posledice ter možnosti sanacij. Izzivi in stanje okolja v Sloveniji in svetu.

Scenariji okoljskih nezgod, modeliranje okoljskih nezgod za potrebe prostorskega načrtovanja. Metodologije za vrednotenje posameznih okoljskih tveganj. Tveganje posameznika in skupinsko tveganje. Kriteriji

Content (Syllabus outline):

European and Slovene legislation for water, air and soil pollution. Legislation in the field of environmental friendly technologies, environmental ISO standards, IPPC Directive. Environmental risks and methodologies for identification of environmental risks. Environmental accidents and their consequences and mitigation possibilities.

Scenarios of environmental accidents, modelling of environmental accidents. Methodologies for assessing individual environmental risks. The risk of individual and group risk.

sprejemljivosti. Računalniška orodja in njihova uporaba: odločanje v negotovosti na osnovi nepopolnih podatkov, odločitvena drevesa, diagrami vpliva.
Izdelava varnostnih poročil, interpretacija rezultatov varnostnih analiz, upravljanje z okoljskimi tveganji.

Computer tools and their application:
Decision-making under uncertainty based on incomplete data, decision trees, influence diagrams.
Making safety reports, interpretation of the results of safety analyses, management of environmental risks.

Temeljna literatura in viri / Readings:

Glavna literatura / Primary literature:

- AIChE: Guidelines for Technical Management of Chemical Process Safety, New York 1989
- Ian Sutton: Process Reliability and Risk Management, Van Nostrand New York, 1992

Pomožna literatura / Additional literature:

- J.X.Wang, M.L.Roush: What Every Engineer should know about Risk Engineering and Management, Marcel Decker INC. , New York 2000
- ACSNI: Organizing For Safety, Health and Safety Commission, April 1993,
- Lloyd's Register The Engineering Council: Guidelines on Risk Issues, UK 1993
- Perrow C.: Normal Accidents, Living with High-Risk Technologies, Basic Books, New York, 1985
- Arendt et al: Evaluating Process Safety in the Chemical Industry, A Manager's Guide to Quantitative Risk Assessment, Chemical Manufacturers Association, Washington, USA, 1989
- Clemen, Reilly: Making Hard Decisions, PWS- Kent Publishing Company, 1991

Cilji in kompetence:

Študentje naj bi spoznali, kako zbrati informacije o okoljskih tveganjih ter kako te informacije lahko koristijo pri načrtovanju preventivnih ukrepov za zagotavljanje varnosti v okolju in kako lahko s pomočjo vedenja o okoljskih tveganjih lahko načrtujemo svoje dejavnosti, da bodo varne in tudi prijazne do okolja ter da bodo ob morebitnih okoljskih nezgodah posledice čim manjše.

Objectives and Competences:

Students should learn how to gather information on environmental risks and how this information can be useful in planning preventive measures to ensure the safety of the environment and how you can use knowledge about environmental risks can plan their activities to a safe and friendly environment and to will be minimized the potential environmental consequences of accidents.

Predvideni študijski rezultati:

Znanje in razumevanje

Študentje naj bi pridobil osnovna teoretska in praktična znanja, ki so potrebna za razumevanje okoljskih problemov in tveganj, ki so z njimi povezana. Razumel bo kako so posamezni elementi tveganj vpeti v odločitveni proces glede tehnoloških pristopov k okoljskim tveganjem.

Intended Learning Outcomes:

Knowledge and Comprehension

Students should acquire basic theoretical and practical knowledge necessary for understanding environmental problems and risks that are associated with them. They will understand how the individual elements of risk embedded in the decision-making process with respect to technological approaches to environmental risks.

<p><u>Uporaba</u> Znal bo uporabljati tako zakonodajo kot tudi teoretične in praktične pristope k reševanju problemov okoljskih tveganj in se na njihovi osnovi odločati o obrambnih in blažilnih mehanizmih, ki se jih za konkreten primer uporabi.</p>	<p><u>Application</u> He will be able to use both the law as well as theoretical and practical approaches to solving the problems of environmental risks and to decide based on their defense and mitigation mechanisms, which are for the specific application.</p>
<p><u>Refleksija</u> Teoretska in praktična znanja bo lahko študent uporabil pri reševanju praktičnih in teoretskih problemov. Spoznanja o zmogljivostih in omejitvah metod za oceno okoljskih tveganja ter kritično uporabo numeričnih modelov za oceno okoljskih posledic za dobro odločanje.</p>	<p><u>Analysis</u> The student in solving practical and theoretical problems will use theoretical and practical knowledge. Knowledge of the capabilities and limitations of methods to assess environmental risks and critical use of numerical models to assess the environmental consequences of good decision-making.</p>
<p><u>Prenosljive spretnosti</u> Študent bo pridobil analitične spretnosti in logično razmišljanje kot tudi spretnosti za učinkovito identifikacijo nezgodnih scenarijev.</p>	<p><u>Skill-transference Ability</u> Students will gain analytical skills and logical thinking as well as skills for effective identification of accident scenarios.</p>

Metode poučevanja in učenja:

<p>Predavanja Seminarske vaje Seminarska naloga s področja okoljskih tveganj</p>
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Learning and Teaching Methods:

<p>Lectures Tutorials Coursework in the field of environmental risks</p>
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Načini ocenjevanja:

<p>Pisni izpit Seminarska naloga</p>
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Delež (v %) /
Weight (in %)

Assessment:

<p>Written exam Coursework</p>

Reference nosilca / Lecturer's references:

- **ŽGAJNAR GOTVAJN, Andreja**, BISTAN, Mirjana, TIŠLER, Tatjana, ENGLANDE, A. J., ZAGORC-KONČAN, Jana. The relevance of bisphenol A adsorption during Fenton's oxidation. *International journal of environmental science and technology*, ISSN 1735-1472, 2013, vol. 10, no. 6, str. 1141-1148.

- **ŽGAJNAR GOTVAJN, Andreja**, KALČÍKOVÁ, Gabriela, ZUPANČIČ, Marija, ZAGORC-KONČAN, Jana. Determination of impact of landfill leachate to nitrification. *Fresenius environmental bulletin*, ISSN 1018-4619. [Print ed.], 2012, vol. 21, no. 8c, str. 2447-2452.

- **ŽGAJNAR GOTVAJN, Andreja**, ZAGORC-KONČAN, Jana, COTMAN, Magda. Fenton's oxidative treatment of municipal landfill leachate as an alternative to biological process. *Desalination*, ISSN 0011-9164. [Print ed.], 2011, vol. 275, no. 1/3, str. 269-275.

doc. dr. Mitja Kožuh

- **KOŽUH, Mitja**, PETELIN, Stojan, PERKOVIČ, Marko. Can classification societies with their rules on redundancy propulsion improve statistics on oil spills and cleaning costs?. *Marine engineering*, ISSN 1346-1427, 2007, vol. 42, no. 3, str. 113-118, graf. prikazi. [COBISS.SI-ID 28861445]

- **KOŽUH, Mitja**. The Seveso II Directive in new european member states : the case of Slovenia.

Acta chimica slovenica, ISSN 1318-0207. [Tiskana izd.], 2010, vol. 57, no. 1, str. 17-28. <http://acta.chem-soc.si/57/57-1-017.pdf>. [COBISS.SI-ID [33794565](#)]

- **KOŽUH, Mitja**. Preventing hydrogen detonations in road tunnels hydrogen trap concept.

International journal of hydrogen energy, ISSN 0360-3199. [Print ed.], 2014, vol. 39, no. 30, str. 17434-17439, ilustr. [COBISS.SI-ID [1782063](#)]

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