

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

<b>Predmet:</b>	TEHNIŠKA VARNOST
<b>Course Title:</b>	TECHNICAL SAFETY

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
MAG Tehniška varnost, 2. stopnja	/	2.	4.
USP Technical Safety, 2 <sup>nd</sup> Cycle	/	2 <sup>nd</sup>	4 <sup>th</sup>

**Vrsta predmeta / Course Type:**

obvezni / Mandatory

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

TV2A1

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

**Nosilec predmeta / Lecturer:**

doc. dr. Mitja Kožuh / Dr. Mitja Kožuh, Assistant Professor  
doc. dr. Klementina Zupan / Dr. Klementina Zupan, 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.

**Vsebina:**

Principi tehniške varnosti  
Zakonodaja na področju tehniške varnosti  
Kvalitativne metode in njih uporaba  
Kvantitativne metode za oceno tveganj  
Uporaba računalniških programov za oceno tveganj  
Tveganja na delovnem mestu  
Analize vzrokov nezgod Root cause analize  
Tveganje posameznika  
Skupinsko tveganje  
Izdelava varnostnih poročil  
Interpretacija rezultatov varnostnih analiz

**Content (Syllabus outline):**

Principles of Technical Safety  
Legislation on the field of technical safety  
Qualitative methods and their use  
Quantitative methods for risk assessment  
Use of computer codes for risk assessment  
Work place risks  
Root cause analysis  
Individual risk  
Societal risk  
Safety reports  
Interpretation of the safety assessment results

**Temeljna literatura in viri / Readings:**

**Glavna literatura:**

- AIChE: Guidelines for Technical Management of Chemical Process Safety, New York 1989 (30%)
- Ian Sutton: Process Reliability and Risk Management, Van Nostrand New York, 1992 (20%)

**Pomožna literatura:**

- 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 tveganjih ter kako te informacije lahko koristijo pri načrtovanju preventivnih ukrepov za zagotavljanje varnosti in kako lahko s pomočjo vedenja o tveganjih lahko načrtujemo svoje dejavnosti, da bodo varne in tudi prijazne do zaposlenih ter da bodo ob morebitnih nezgodah posledice čim manjše.

**Objectives and Competences:**

Students will learn how to gather information on risks and how this information can be used for planning of preventive measures for safety assurance and how can we by knowledge about risks plan activities to be safe and employee friendly and in the case of accidents to have as small as possible consequences.

**Predvideni študijski rezultati:****Znanje in razumevanje**

Študentje naj bi pridobil osnovna teoretska in praktična znanja, ki so potrebna za razumevanje tveganja različnih vrst. Razumeli bodo kateri so elementi tveganj. Kako lahko zmanjšujemo tveganja in s kakšnimi ukrepi povečujemo varnost. Razumel bo vlogo človeka v socio-tehnoloških sistemih in razumel zakaj je tako pomembna povezava človek stroj.

**Uporaba**

Znanja bo lahko uporabi pri problemih nevarnih postopkov in sistemov iz različnih področij človeškega delovanja.

**Refleksija**

Teoretska in praktična znanja bo lahko študent uporabil pri reševanju praktičnih in teoretskih problemov. Spoznanja o zmogljivostih in

**Intended Learning Outcomes:****Knowledge and Comprehension****Knowledge and Comprehension**

Students will acquire the basic theoretical and practical skills to understand different risks. They will understand the elements of the risks. How can we reduce the risks and with what measures we can enhance safety. He will understand the role of human in the socio-technological systems and understand why the connection between the man and machine is so important.

**Application**

Knowledge will be used during problems of dangerous procedures and systems in different areas of human activity

**Analysis**

Theoretical and practical skills student will use during practical and theoretical problems solving. His recognition of capabilities and

omejitvah metod tehniške varnosti mu bodo koristila pri sprejemanju tako operativnih, taktičnih in tudi pri strateških odločitvah	limitations of technical safety methods will enable him while taking strategic, tactical and operational decisions.
<u>Prenosljive spretnosti</u> Pridobil si bo tako analitske spretnosti za reševanje problemov kot tudi komunikacijske spretnosti, ki jih bo potreboval pri vsakdanjem delu.	<u>Skill-transference Ability</u> He will get analytical skills as well as communication skills needed during every day work.

### Metode poučevanja in učenja:

Predavanja Seminarske vaje Seminarska naloga s področja tveganj
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### Learning and Teaching Methods:

Lectures Seminar exercises Seminar work from the field of risks
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Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
A) Seminarska naloga	30	A) Seminar work
B) Izvedba in predstavitev projekta	30	B) Project and its presentation
C) Pisni izpit	40	C) Written exam
Skupna ocena mora biti 6 ali več (uspešno).		Grade should be 6 or higher (successful)

### Reference nosilca / Lecturer's references:

- **KOŽUH, Mitja**, PEKLENIK, Janez. A method for identification and quantification of latent weaknesses in complex systems. *Cognition, technology & work*, 1999, vol. 1, no. 4, str. 211-221. [COBISS.SI-ID 15086119]

- **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. [http://ac.els-cdn.com/S0360319914022678/1-s2.0-S0360319914022678-main.pdf?\\_tid=9d246496-459a-11e4-98a8-00000aab0f01&acdnat=1411749289\\_353756d0ea8b0cb08c2bc02efa8c233c](http://ac.els-cdn.com/S0360319914022678/1-s2.0-S0360319914022678-main.pdf?_tid=9d246496-459a-11e4-98a8-00000aab0f01&acdnat=1411749289_353756d0ea8b0cb08c2bc02efa8c233c), doi: 10.1016/j.ijhydene.2014.08.009. [COBISS.SI-ID 1782063]

- AL-MANSOUR, Fouad, **KOŽUH, Mitja**. Risk analysis for CHP decision making within the conditions of an open electricity market. *Energy*, ISSN 0360-5442. [Print ed.], 2007, vol. 32, no. 10, str. 1905-1916. [COBISS.SI-ID 20987431]

- **ZUPAN, Klementina**, MARINŠEK, Marjan. Combustion-derived La [sub] (1-x)Sr [sub] xMn [sub] 0.5Cr [sub] 0.5O [sub] (3[plus minus][delta]) (x = (0.20, 0.25)) perovskite : preparation, properties, characterization = Z zgorevalno sintezo pridobljen perovskit La [spodaj] (1-x)Sr [spodaj] xMn [spodaj] 0,5Cr [spodaj] 0,5O [spodaj] (3[plus minus][delta]) (x = (0,20, 0,25)) : priprava, lastnosti, karakterizacija. *Materiali in tehnologije*, ISSN 1580-2949. [Tiskana izd.], no. 6, 2014, str. 885-891, ilustr. [COBISS.SI-ID 1536154563]

- **ZUPAN, Klementina**, MARINŠEK, Marjan, NOVOSEL, Barbara. Combustible precursor behaviour in the lanthanum chromite formation process = Termične lastnosti reakcijskega gela za pripravo

lantanovega kromita. *Materiali in tehnologije*, ISSN 1580-2949. [Tiskana izd.], 2011, vol. 45, no. 5, str. 439-445. [COBISS.SI-ID 35456261]  
- MARINŠEK, Marjan, **ZUPAN, Klementina**. Microstructure evaluation of sintered combustion-derived fine powder NiO-YSZ. *Ceramics international*, ISSN 0272-8842. [Print ed.], 2010, vol. 36, no. 3, str. 1075-1082, doi: [10.1016/j.ceramint.2009.12.014](https://doi.org/10.1016/j.ceramint.2009.12.014). [COBISS.SI-ID [34080773](https://www.cobiss.si/urn:nbn:si:coibis:34080773)]

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