

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: TEHNIŠKA VARNOST
Course Title: 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.	3.
USP Technical Safety, 2 nd Cycle	/	2 nd	3 rd

Vrsta predmeta / Course Type: izbirni / Elective

Univerzitetna koda predmeta / University Course Code: TV2A1

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
75	30	45 SV	/	/	150	10

Nosilec predmeta / Lecturer: doc. dr. Mitja Kožuh / Dr. Mitja Kožuh, Assistant Professor
doc. dr. Klementina Zupan / Dr. Klementina Zupan, Assistant Professor

Jeziki / Languages: slovenski / Slovenian
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
Modeliranje posledic nezgod
Tveganja na delovnem mestu
Analize vzrokov nezgod Root cause analize
Tveganje posameznika
Skupinsko tveganje
Izdelava varnostnih poročil
Interpretacija rezultatov varnostnih analiz in vodenje okoljskih tveganj

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
Accident consequence modelling
Work place risks
Root cause analysis
Individual risk
Societal risk
Safety reports
Interpretation of the safety assessment results and risk management

Temeljna literatura in viri / Readings:

Glavna literatura:

- 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:

- 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.

Intended Learning Outcomes:

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

<p><u>Refleksija</u> Teoretska in praktična znanja bo lahko študent uporabil pri reševanju praktičnih in teoretskih problemov. Spoznanja o zmogljivostih in omejitvah metod tehniške varnosti mu bodo koristila pri sprejemanju tako operativnih, taktičnih in tudi pri strateških odločitvah</p>	<p><u>Analysis</u> Theoretical and practical skills student will use during practical and theoretical problems solving. His recognition of capabilities and limitations of technical safety methods will enable him while taking strategic, tactical and operational decisions.</p>
<p><u>Prenosljive spretnosti</u> Pridobil si bo tako analitske spretnosti za reševanje problemov kot tudi komunikacijske spretnosti, ki jih bo potreboval pri vsakdanjem delu.</p>	<p><u>Skill-transference Ability</u> He will get analytical skills as well as communication skills needed during every day work.</p>

Metode poučevanja in učenja:

Predavanja
Seminarske vaje
Seminarska naloga s področja okoljskih tveganj

Learning and Teaching Methods:

Lectures
Seminar exercises
Seminar work from the field of risks

Načini ocenjevanja:

Izpit pisni Ocene: 6-10 pozitivno

Delež (v %) /

Weight (in %)

Assessment:

Written exam: Grades 6-10 positive

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, 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/id/34080773)]

UL
EFKKT