

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

<b>Predmet:</b>	VODENJE TVEGANJA
<b>Course Title:</b>	RISK MANAGEMENT

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
MAG Tehniška varnost, 2. stopnja	/	1.	1.
USP Technical Safety, 2 <sup>nd</sup> Cycle	/	1.	1.

**Vrsta predmeta / Course Type:** obvezni/ Mandatory

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

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

**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:**

1. Sistemi vodenja tveganja, osnovni elementi vodenja tveganja.
2. Odgovornost: nameni in cilji, elementi odgovornosti: avtoriteta, odgovornost, podpora, informacije.
3. Vedenje o procesu in dokumentacija: definicija procesa, projektni kriteriji, načrtovanje procesa in opreme, varnostni sistemi.
4. Navodila za varnostni pregled velikih projektov: varnostni pregled, pregled projekta in varnostnih navodil, navodila za izvajanje projekta in nadzor
5. Vodenje procesnega tveganja: identifikacija nevarnosti, analiza tveganja med

**Content (Syllabus outline):**

1. Risk management systems, basic elements
2. Accountability: objectives and goals, Elements of accountability: authority, responsibility, support and information
3. Process Knowledge and documentation, Definition of process, design basis criteria Process and equipment design, safety systems
4. Process safety review procedures for capital projects: safety reviews process design and review procedures, process management procedures and controls
5. Process risk management: Hazard identification: HAZOP, residual risk management Process management during emergencies

obratovanjem, upravljanje z ostalimi tveganji, vodenje procesa med neizvedbami.

6. Vodenje sprememb v procesu: sprememba naprave, sprememba organizacije, sprememba navodil, stalne spremembe, začasne spremembe.

7. Integriteta procesa in opreme: zanesljivostno inženirstvo, obratovalna navodila, preventivno vzdrževanje in navodila.

8. Človeški faktor: analiza človeških napak

9. Usposabljanje in izvrševanje: izbira in razvoj programov za usposabljanje

10. Preiskava neizvedbe: velike neizvedbe, vključevanje zunanjih ekspertov, komunikacija, zbiranje podatkov in analiza.

11. Pregledi in popravne akcije: pregledi, ugotavljanje spoštovanja obveznosti, notranji in zunanji pregledovalci

6. Management of change Change of technology, change of organization, change of procedures, permanent changes, temporary changes

7. Process and Equipment integrity Reliability engineering, Maintenance procedures Testing procedures

8. Human factors, Human error analysis

9. Training and Performance, Selection and development of training programs

10. Accident investigation, Major accidents, inclusion of third party experts, communication, data acquisition and analysis

11. Audits and Corrective Actions, Compliance reviews, Internal / External Auditors

#### 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 (30%)
- Guidelines for Chemical Process Quantitative Risk Analysis, Second Ed., Center for Chemical Process Safety, American Institute of Chemical Engineers, 2000. (10%)
- Guidelines for Analyzing and Managing the Security Vulnerabilities of Fixed Chemical Sites (10%)

##### 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

#### Cilji in kompetence:

Študentje naj bi spoznali, kako informacije o tveganju lahko koristijo pri načrtovanju preventivnih ukrepov za zagotavljanje varnosti in kako lahko s pomočjo vedenja o tveganju optimiramo svoje dejavnosti, da bodo varne in da bodo tudi prijazne do okolja.

#### Objectives and Competences:

Students should learn how they can benefit by information on risk for designing preventive measures assuring safety and how we can optimize our activities to be safe and environmental friendly.

**Predvideni študijski rezultati:**

<u>Znanje in razumevanje</u> Študentje naj bi pridobili osnovna teoretska in praktična znanja, ki so potrebna za vodenje tveganja. Spoznali bodo vse elemente vodenja tveganja in tudi kako se odloča v pogojih negotovosti.
<u>Uporaba</u> Znanja, ki jih bodo študentje osvojili jim bodo pomagala pri odločanju glede vseh vrst tveganj. Znali bodo uporabiti rezultate varnostnih analiz in jih tudi kritično oceniti ter se na njihovi osnovi tudi odločiti kako se nevarnostim izogniti in kako zmanjšati posledice.
<u>Refleksija</u> Teoretska in praktična znanja bo lahko študent uporabil pri reševanju praktičnih in teoretskih problemov (študij in praksa). S pomočjo spoznanj o zmogljivostih in omejitvah posameznih metod za oceno tveganj bo lahko študent ocenil kaj v praksi pomenijo in to mu bo dalo osnovo za mnoge pomembne kasnejše odločitve.
<u>Prenosljive spretnosti</u> Logično razmišljanje in logično povezovanje nepopolnih informacij v celoto na osnovi katere se vrši proces odločanja so spretnosti, ki bodo študentu koristile povsod.

**Intended Learning Outcomes:**

<u>Knowledge and Comprehension</u> Student should gathered basic theoretical and practical skills needed for risk management and also how to make decisions in uncertainty
<u>Application</u> Knowledge, which will students gather will help them when making decisions on variety of risks. They will be able to use the results of safety analyses in to judge them critically and to decide how to avoid the hazards and to reduce the consequences.
<u>Analysis</u> Theoretical and practical knowledge will be used for solving theoretical and practical problems. With knowledge about the capabilities and limitations of the risk assessment methods students will find out their use in praxis which will enable them later making important decisions.
<u>Skill-transference Ability</u> Logical thinking and logical linking imperfect information into the whole based on which decision process is taking place are skills from which will students benefit in all professional areas.

**Metode poučevanja in učenja:**

Predavanja Laboratorijske vaje
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**Learning and Teaching Methods:**

Lectures Exercises
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**Načini ocenjevanja:**

Izpit pisni in ustni. Ocene: 6-10 pozitivno
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Delež (v %) /

Weight (in %)

**Assessment:**

Exam written and oral. Grades 6-10 positive
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**Reference nosilca / Lecturer's references:**

- <b>KOŽUH, Mitja</b> . 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. <a href="http://ac.els-cdn.com/S0360319914022678/1-s2.0-S0360319914022678-main.pdf?_tid=9d246496-459a-11e4-98a8-00000aab0f01&amp;acdnat=1411749289_353756d0ea8b0cb08c2bc02efa8c233c">http://ac.els-cdn.com/S0360319914022678/1-s2.0-S0360319914022678-main.pdf?_tid=9d246496-459a-11e4-98a8-00000aab0f01&amp;acdnat=1411749289_353756d0ea8b0cb08c2bc02efa8c233c</a> , doi: 10.1016/j.ijhydene.2014.08.009. [COBISS.SI-ID 1782063], [JCR, SNIP]
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- 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]
- **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], [JCR, SNIP, WoS do 5. 5. 2010: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 25. 10. 2011: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0]
- **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]