

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Energetski management
Course title:	Energy management

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Tehnologije in sistemi – prva stopnja	Tehnologije in sistemi	tretji	peti
Technologies and systems – 1st cycle	Technologies and systems	third	fifth

Vrsta predmeta / Course type modularni/modular

Univerzitetna koda predmeta / University course code: TS M3 UN3

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Laboratorijske vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		15	15		100	6

Nosilec predmeta / Lecturer: mag. Milan Šturm, viš. pred.

Jeziki / Languages:	Predavanja / Lectures:	slovenski/slovenian
	Vaje / Tutorial:	slovenski/slovenian

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

- vpis v tretji letnik študija
- opravljena izpita iz tehniške termodinamike in energetskih in delovnih strojev,
- zaželen opravljen izpit iz mehanike II.

Prerequisites:

- enrollment in the third year of study
- passed exams in Technical thermodynamics and Energy and working machines,
- Passed exam in mechanics II is desirable.

Vsebina:

- *Energetski sistemi.* Razpoložljivost. Gospodarnost. Stroški in cena. Letni diagrami proizvodnje energije. Energetske bilance. Naraščanje porabe energentov.
- *Prenos.* Shranjevanje. Odjem energije, posebej toplote in elektrike.
- *Vrste energije.* Vrednost energije. Eksurgija in anergija. Izkoristki energetskih procesov.

Content (Syllabus outline):

- *Energy systems.* Availability. Economy. Cost and price. Annual diagrams of energy production. Energy balances. Growing energy consumption.
- *Transfer.* Storage. Consumption of energy, especially heat and electricity.
- *Types of energy.* Energy value. Exergy and anergy. Benefits of energy processes.

- *Toplota in temperatura*. Nepovračljivost in entropija.
- *Energijske izkaznice*.
- *Upravljanje z energetskimi sistemi in uporaba IoT*.
- Energetska sanacija stavb.

- *Heat and temperature*. Irreversibility and entropy.
- *Energy certificates*.
- *Management of energy systems and use of IoT*.
- Energy rehabilitation of buildings.

Temeljni literatura in viri / Readings:

Tuma, M., Sekavčnik, M. (2004) *Energetski sistemi – preskrba z električno energijo in toploto*, 3. izdaja. Ljubljana: Fakulteta za strojništvo, UL (poglavja: 1, 2, 9 in 10).

Boyle, G., Everett, B. (2003) *Energy Systems and Sustainability (power for a sustainable future)*. Oxford University Press.

Čibej, J. A. (1998) *Matematika za računovodje in finančnike*. Ljubljana: Zveza računovodij, finančnikov in revizorjev Slovenije.

Cilji in kompetence:

Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:

- sposobnost evidentiranja problema in njegove analize ter predvidevanja operativnih rešitev v tehnološkem smislu ali v procesu organizacije in vodenja,
- sposobnost obvladovanja standardnih razvojnih metod, postopkov in procesov,
- pridobitev poglobljenega znanja o problemih industrijske energetike,
- sposobnost uporabe pridobljenega znanja v praksi,
- sposobnost obvladovanja razvoja,
- sposobnost razumevanja in reševanja konkretnih energetskih problemov,
- suverenost in avtonomnost na področju energetskega strokovnega dela,
- sposobnost za svetovalno delo in sposobnost prenosa znanja drugim,
- kooperativnost, usposobljenost za timsko delo,
- razvoj strokovnih veščin in spretnosti na področju tehnologij in sistemov,
- usposobljenost za organiziranje in vodenje oddelka ali skupine,
- usposobljenost za komuniciranje z interesnimi skupinami (dobavitelji, kupci,

Objectives and competences:

The learning unit mainly contributes to the development of the following general and specific competences:

- the ability to grasp and analyse a problem, as well as foresee operational solutions in the technological sense or in the process of organisation and management,
- the ability to master standard development methods, procedures and processes,
- acquisition of in-depth knowledge about the problems of industrial energy,
- the ability to use acquired theoretical knowledge in practice,
- the ability to manage development,
- the ability to solve specific work problems in the field of energy,
- autonomy in professional work in the field of energy,
- qualification for consulting work (transfer of knowledge),
- willingness to cooperate and work in a team,
- development of professional skills and abilities in the field of technologies and systems,
- competence in organising and managing a department or group,

konkurenco, strokovnjaki z različnih področij, politiki itd.),

- usposobljenost za svetovalno delo.

- competence in communicating with interest groups (suppliers, customers, competition, experts from various fields, politicians, etc.),
- qualification for consulting work (transfer of knowledge).

Predvideni študijski rezultati:

Znanje in razumevanje:
Študent/študentka:

- zna uporabljati pridobljeno znanje za reševanje energetskih problemov,
- zna poiskati specialno strokovno literaturo in jo uporabiti v tehnoloških procesih,
- zna uporabljati pridobljeno teoretično znanje v energetiki,
- vidi medsebojne povezave v enostavnih in sestavljenih energetskih procesih,
- zna kritično ovrednotiti šibke točke v procesih,
- vidi povezave s sorodnimi učnimi predmeti.

Intended learning outcomes:

Knowledge and understanding:
Student:

- knows how to apply the acquired knowledge to solve energy problems,
- knows how to find specialised professional literature and use it in technological processes,
- knows how to apply the acquired theoretical knowledge in the energy field,
- recognises interrelationships in simple and complex energy processes,
- can critically evaluate weak points in processes,
- sees connections with related subjects.

Metode poučevanja in učenja:

- *predavanja,*
- *računske in laboratorijske vaje s praktičnimi primeri iz industrije.*

Learning and teaching methods:

- *lectures,*
- *computational and laboratory tutorials with practical examples from industry.*

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
<ul style="list-style-type: none"> • pisni del izpita (pozitivna ocena je pogoj za opravljanje ustnega dela izpita), • ustni del izpita. 	25	<ul style="list-style-type: none"> • the written part of the exam (a positive grade is a condition for passing the oral part of the exam),
<ul style="list-style-type: none"> • Seminarsko delo 	55	<ul style="list-style-type: none"> • the verbal part of the exam.
Ocenjevalna lestvica: ECTS.	20	<ul style="list-style-type: none"> • Seminar work Grading scale: ECTS.