



Univerza v Mariboru

Medicinska fakulteta

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

|                      |                    |
|----------------------|--------------------|
| <b>Predmet:</b>      | Urgentna medicina  |
| <b>Course title:</b> | Emergency Medicine |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|-----------------------------------------------------------|-------------------------------|-------------------------|----------------------|
| EMŠP Splošna medicina                                     |                               | 5.                      | 10.                  |
| General medicine                                          |                               | 5th                     | 10th                 |

Vrsta predmeta / Course type

redni / regular

Univerzitetna koda predmeta / University course code:

| Predavanja<br>Lectures | Seminar<br>Seminar | Sem. vaje<br>Tutorial | Lab. vaje<br>Laboratory work | Praktikum<br>Practical work | Samost. delo<br>Individ. work | ECTS |
|------------------------|--------------------|-----------------------|------------------------------|-----------------------------|-------------------------------|------|
| 10                     | 20                 | -                     | -                            | 15                          | 45                            | 3    |

Nosilec predmeta / Lecturer:

izr. prof. dr. Matej Strnad, dr. med., spec.

Jeziki /

Predavanja / Lectures:

slovensko / slovene

Languages:

Vaje / Tutorial:

slovensko / slovene

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

Prerequisites:

## Vsebina:

Predavanja:

- sistem NMP v Sloveniji,
- masovne nesreče in principi triaže,
- pristop k nenadno obolelemu oz. poškodovanemu odraslemu,
- pristop k nenadno obolelemu oz. poškodovanemu otroku,
- bolečina v prsih,
- dispneja,
- bolečina v trebuhu,
- sinkopa in motnje zavesti,
- šok,
- huda poškodba glave in možganov.

Seminarji:

- univerzalni ABCDE pristop,
- bolečina v prsih in trebuhu ter dispneja,
- motnje zavesti in zastrupitve.

## Content (Syllabus outline):

Lectures:

- EMS system in Slovenia,
- mass casualty incidents and principles of triage,
- systematic approach to acutely ill/injured adult,
- systematic approach to acutely ill/injured child,
- chest pain,
- dyspnea,
- abdominal pain,
- syncope and altered level of consciousness/ mental status,
- shock,
- severe head and brain injury.

Seminars:

- universal ABCDE approach,
- chest pain, abdominal pain, and dyspnea,
- altered mental status/level of consciousness and intoxication.

**Praktikum:**

- urgentni center (UC) enota Bolezni,
- UC enota Poškodbe
- UC enota Hitri pregledi

**Practical work:**

- Emergency department (Emergencies)
- Emergency department (Accidents)
- Emergency department (Fast track)

**Temeljni literatura in viri / Readings:****Temeljna literatura / Basic readings:**

1. Tintinalli JE, Kelen GD, Stapczynski JS. Emergency medicine – A comprehensive study guide – 7th ed. , McGraw-Hill, New York 2011.
2. Marx JA, Hockberger RS, Walls RM. Rosen's Emergency Medicine: concepts and clinical practice, 8th ed., Philadelphia, Mosby-Elsevier, 2014.
3. Samuels M, Wieteska S. Advanced pediatric life support: the practical approach. 5th ed., Chichester, West Sussex, UK, Wiley-Blackwell 2011.
4. American college of surgeons. Advanced trauma life support. 9th ed. Chicago, ... 2012.
5. Monsieurs KG, Nolan JP, Bossaert LL et al. European resuscitation council guidelines for resuscitation 2015. Section 1. Executive summary. Resuscitation 2015 (95):1-80.
6. Perkins GD, Handley AJ, Koster RW et al. European resuscitation council guidelines for resuscitation 2015. Section 2. Adult basic life support and automated external defibrillation. Resuscitation 2015 (95): 81-99.
7. Soar J, Nolan JP, Böttiger BW et al. European resuscitation council guidelines for resuscitation 2015. Section 3. Adult advanced life support. Resuscitation 2015 (95): 100-47.

**Nadaljevalna, dopolnilna literatura / Additional, complementary readings:**

1. Grmec Š, Čretnik A, Kupnik D. Oskrba poškodovancev v predbolnišničnem okolju. Univerza v Mariboru; Maribor, 2006.
2. Grmec Š, Kupnik D (urednika). Nujna stanja, Katedra za prvo pomoč in Katedra za družinsko medicino MF Maribor, Zbirka Acuta, 2008.
3. Prosen G, urednik. Šola urgence: zbornik predavanj: zbornik I. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2016. Dostopno na <http://www.szum.si/literatura.html> (Zbornik\_Sola\_urgence\_1\_letnik\_FINAL\_VERZIJA\_1\_1-final-2.pdf)
4. Prosen G, urednik. Zbornik II. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2014. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik-SUM-2014.pdf)
5. Prosen G, urednik. Zbornik III. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2015. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik-SUM-2015.pdf)
6. Prosen G, urednik. Zbornik 4. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2016. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik sum-1\_4.pdf)
7. Prosen G, urednik. Zbornik V. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2017. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik SUM 1\_5\_v2.pdf)
8. Prosen G, urednik. Zbornik VI. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2018. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik-SUM-2018.pdf)
9. Prosen G, urednik. Zbornik VII. Šole urgence. – 1. izd. – El. knjiga. – Ljubljana: Slovensko združenje za urgentno medicino 2019. Dostopno na: <http://www.szum.si/literatura.html> (Zbornik-SUM-2019.pdf)
10. Možina H, Prosen G, urednika. Kompendij pripravništva za poklic zdravnik. – 1. izd. – El. knjiga. - Ljubljana: Zdravniška zbornica Slovenije 2018. Dostopno na: [https://www.zdravniskazbornica.si/docs/default-source/e-izobrazevanja/kompendij-julij-2018-za-print-a5.pdf?sfvrsn=ecec3336\\_23](https://www.zdravniskazbornica.si/docs/default-source/e-izobrazevanja/kompendij-julij-2018-za-print-a5.pdf?sfvrsn=ecec3336_23)

**Cilji in kompetence:**

Cilji so usposobiti slušatelje, da bodo poznali in razumeli:

- organiziranost Nujne medicinske pomoči v Sloveniji ter zakonodajo s področja Nujne medicinske pomoči,
- značilnosti helikopterske NMP ter primarnih in sekundarnih helikopterskih prevozov,

**Objectives and competences:**

The objectives are to enable students to know and understand:

- organization of emergency medical services in Slovenia, and corresponding legislation related to emergency medicine,
- characteristics of helicopter EMS, and primary and secondary helicopter transports,

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| <ul style="list-style-type: none"> <li>• organiziranost in naloge Službe NMP v primeru množičnih nesreče ter primarno, sekundarno in nadaljnje triaže,</li> <li>• univerzalni ABCDE pregled,</li> <li>• pristop in nujno ukrepanje pri nediferenciranem življenjsko ogroženem bolniku oziroma otroku,</li> <li>• pristop in nujno ukrepanje pri življenjsko ogroženem oziroma kritičnem poškodovancu na terenu ter priprava takega poškodovanca na transport v ustrezno bolnišnico,</li> <li>• spremembe smernic temeljnih in dodatnih postopkov oživljanja odraslih, otrok in novorojenčkov,</li> <li>• pristop k bolniku z nediferencirano bolečino v prsih (začetni pristopi, kritične diferencialne diagnoze, diagnostične metode, začetno zdravljenje),</li> <li>• pristop k bolniku z nediferencirano bolečino v trebuhu (začetni pristopi, kritične diferencialne diagnoze, nujne diagnostične metode, začetno zdravljenje),</li> <li>• pristop k bolniku z nediferenciranim oteženim dihanjem (začetni pristopi, kritične diferencialne diagnoze, nujne diagnostične metode, začetno zdravljenje),</li> <li>• pristop k bolniku z nediferencirano motnjo zavesti (začetni pristopi, kritične diferencialne diagnoze, nujne diagnostične metode, začetno zdravljenje),</li> <li>• obravnavno bolnika s (hudo) poškodbo glave in možganov na terenu,</li> <li>• najpogostejše zastrupitve po starostnih skupinah, klinične toksindrome ter začetno ukrepanje pri bolniku z domnevno zastrupitvijo (varni pristop, ABCDE pregled, simptomatska podpora, nujni antidoti).</li> </ul> | <ul style="list-style-type: none"> <li>• organization and tasks of EMS in the case of mass casualty incidents, and primary, secondary and further triage,</li> <li>• universal ABCDE survey,</li> <li>• approach to and urgent interventions in undifferentiated critically ill adult or child,</li> <li>• approach to and urgent interventions in critically ill or injured patient in prehospital area, and preparation of such patient for transport to an appropriate hospital,</li> <li>• changes in the basic and advanced life support guidelines for adults, children, and new-borns,</li> <li>• approach to the patient with undifferentiated chest pain (initial approach, critical differential diagnosis, diagnostic methods, initial treatment),</li> <li>• approach to the patient with undifferentiated abdominal pain (initial approach, critical differential diagnosis, diagnostic methods, initial treatment),</li> <li>• approach to the patient with undifferentiated shortness of breath (initial approach, critical differential diagnosis, diagnostic methods, initial treatment),</li> <li>• approach to the patient with undifferentiated altered mental status/level of consciousness (initial approach, critical differential diagnosis, diagnostic methods, initial treatment),</li> <li>• approach to the patient with (severe) head and brain injury in prehospital area,</li> <li>• most common intoxication or poisoning by age group, clinical toxindromes, and initial management of the patient with suspected or known intoxication (safe approach, ABCDE survey, symptomatic treatment, antidotes).</li> </ul> |
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**Predvideni študijski rezultati:****Intended learning outcomes:****Znanje in razumevanje:****Knowledge and understanding of:**

- organiziranost Službe NMP v Sloveniji,
- zakonodaje s področja nujne medicinske pomoči,
- organiziranost in lastnosti HNMP,
- organiziranost SNMP v primeru množičnih nesreč ter principov triaže,
- univerzalnega ABCDE pregleda,
- pristopa h kritično bolnemu oz. življenjsko ogroženemu odraslemu oz. otroku,
- pristopa h kritično oz. življenjsko ogroženemu poškodovancu na terenu,
- aktualnih temeljnih in dodatnih postopkov oživljanja odraslih, otrok in novorojenčkov,
- začetnega pristopa, kritičnih diferencialnih diagnoz, nujnih diagnostičnih metod in začetnega ukrepanja pri nediferenciranih bolnikih z bolečinami v prsih in trebuhu, oteženim dihanjem in motnjami zavesti,
- smernic in posebnosti pri obravnavi poškodovanca s hudo poškodbo glave in možganov na terenu oz. v urgentnem centru,

- organization of EMS in Slovenia,
- legislation related to emergency medicine,
- organization and characteristics of HEMS,
- organization of EMS in cases of mass casualty incidents, and principles of triage,
- universal ABCDE survey,
- approach to critically ill adult or child,
- approach to critically injured patients in prehospital area,
- current basic and advanced life support guidelines for adults, children, and new-borns,
- initial approach, critical differential diagnoses, diagnostic methods, and urgent interventions in patients with undifferentiated chest pain, abdominal pain, shortness of breath, and altered mental status/level of consciousness,
- guidelines and particularities when managing a patient with severe head and brain injury in prehospital area or emergency department,

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| <ul style="list-style-type: none"> <li>• najpogostejših zastrupitev v posameznih starostnih skupinah, vključno z začetnim pristopom.</li> </ul> <p>Prenesljive/ključne spretnosti in drugi atributi:</p> <ul style="list-style-type: none"> <li>• pregled kritično bolnega oziroma življenjsko ogroženega bolnika/otroka po principu ABCDE,</li> <li>• izvedba nujnih posegov v sklopu primarnega pregleda ABCDE (oskrba dihalne poti, zdravljenje s kisikom, vzpostavitev znotrajžilnega dostopa in nadomeščanje tekočin, korekcija hipo- in hiperglikemije),</li> <li>• aktivacija ustrezne ekipe NMP (MoEREA, MoENRV, HNMP) in drugih služb,</li> <li>• izvedba primarne triaže na terenu po metodi SIEVE,</li> <li>• pristop k poškodovancu na terenu po sistemu ITLS ter začetni ukrepi in stabilizacija poškodovanca ter priprava na transport v ustrezno bolnišnico,</li> <li>• pristop k bolniku z bolečino v prsih na terenu ali urgentnem centru,</li> <li>• pristop k bolniku z bolečino v trebuhu na terenu ali urgentnem centru,</li> <li>• pristop k bolniku z dispnejo na terenu ali urgentnem centru,</li> <li>• pristop k bolniku z motnjo zavesti/sinkopo na terenu ali urgentnem centru,</li> <li>• pristop k bolniku z zastrupitvijo na terenu ali urgentnem centru,</li> <li>• pristop k poškodovancu s hudo poškodbo glave in možganov na terenu.</li> </ul> | <ul style="list-style-type: none"> <li>• most common intoxication or poisoning in different age groups, including the initial approach.</li> </ul> <p>Transferable/Key skills and other attributes:</p> <ul style="list-style-type: none"> <li>• examination of critically ill or injured adult/child, according to ABCDE principle,</li> <li>• performance of emergency interventions during the primary ABCDE survey (airway management, oxygen therapy, establishing IV access and fluid replacement, correction of hypo- and hyperglycemia),</li> <li>• activation of appropriate EMS (MICU unit, ambulance, HEMS) and other services,</li> <li>• execution of primary triage in prehospital area according to SIEVE method,</li> <li>• approach to injured patient in prehospital area according to ITLS system, and initial interventions and stabilization of the injured, as well as preparation for transport to an appropriate hospital,</li> <li>• approach to the patient with chest pain in prehospital area or emergency department,</li> <li>• approach to the patient with abdominal pain in prehospital area or emergency department,</li> <li>• approach to the patient with shortness of breath in prehospital area or emergency department,</li> <li>• approach to the patient with altered mental status/level of consciousness in prehospital area or emergency department,</li> <li>• approach to the patient with intoxication or poisoning in prehospital area or emergency department,</li> <li>• approach to the patient with severe head and brain injury in prehospital area.</li> </ul> |
| <p><b>Metode poučevanja in učenja:</b></p> <p>Predavanja<br/>Seminarji<br/>Praktično delo</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Learning and teaching methods:</b></p> <p>Lessons<br/>Seminars<br/>Practical work</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Načini ocenjevanja:**

Delež (v %) /  
Weight (in %)

**Assessment:**

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| <p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</p> <p>pisni izpit<br/>ustni izpit</p> <p>Pisni izpit je sestavljen iz 50 MCQ vprašanj v računalniški obliki, za katere je na voljo 45 minut. Ocena iz pisnega izpita se določi po naslednjem kriteriju: 45-50 točk: ocena 10; 40-44 točk: ocena 9; 35-39 točk: ocena 8; 30-34 točk: ocena 7; 26-29 točk: ocena 6; 25 točk ali manj: izpita ni opravil.</p> <p>Končna ocena se izračuna po formuli: <math>(0,5 \times \text{MCQ}) + (0,5 \times \text{ustni izpit})</math>, rezultat se zaokroži na eno decimalno mesto. V primeru, da ima končni rezultat decimalno končnico 0,5 ali več se ocena zaokroži navzgor, sicer pa navzdol.</p> <p>V primeru, da študent na pisnem izpitu doseže manj ali enako kot 25 točk, izpita iz predmeta ni opravil. V primeru, da je na ustnem izpitu ocenjen z manj kot 6, izpita ni opravil.</p> <p><b>ŠTUDIJSKE OBVEZNOSTI ŠTUDENTOV:</b><br/>Obvezna (100 %) prisotnost na seminarjih in vajah. Pred vsakim seminarjem študent samostojno predela snov iz seminarja in opravi pre-test na Moodle. Pre-test je sestavljen iz petih MCQ vprašanj.</p> | <p>50 %<br/>50 %</p> | <p>Type (written exam, oral examination, coursework, project):</p> <p>written exam<br/>oral examination</p> <p>Written exam consists of 50 MCQ in computerized format and is 45 minutes long. Written exam is graded as following: 45-50 points: grade 10; 40-44 points: grade 9; 35-39 points: grade 8; 30-34 points: grade 7; 26-29 points: grade 6; 25 points or less: failed.</p> <p>Final grade is calculated as follows: <math>(0.5 \times \text{MCQ}) + (0.5 \times \text{oral examination})</math>. The result is rounded to one decimal place. Decimal results of the calculation will be rounded to the nearest whole number (0.5 or more is rounded up, less than 0.5 is rounded down).</p> <p>If a student gets 25 or less points at the written exam, he/she has failed the course. If a student does not get at least a grade 6 at the oral examination, he/she has failed the exam.</p> <p><b>ACADEMIC OBLIGATIONS OF STUDENTS:</b><br/>Obligatory (100 %) attendance at coursework and practical work. The student is obligated to study the materials of the seminar before he enters the coursework and to fulfill the pre-test on Moodle. The pre-test is composed from 5 MCQ.</p> |
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**Reference nosilca / Lecturer's references:**

1. KOŽELJ, Anton, STRAUSS, Maja, STRNAD, Matej. Experiencing stress among nurses during resuscitation procedure and legal obligations for healthcare workers in Slovenia. *Medicine, law & society*. [Online ed.]. Oct. 2020, vol. 13, iss. 2, str. [237]-262. ISSN 2630-2535. <https://journals.um.si/index.php/medicine/article/view/855>, DOI: 10.18690/mls.13.2.237-262.2020. [COBISS.SI-ID 37100291], [WoS]
2. BOROVNIK LESJAK, Vesna, ŠORGO, Andrej, STRNAD, Matej. Development, validation and assessment of the test on knowledge about basic life support and use of automated external defibrillator among schoolchildren. *Scandinavian journal of trauma, resuscitation and emergency medicine*. 2019, vol. 27, art. no. 117, str. 1-7. ISSN 1757-7241. <https://sjtrem.biomedcentral.com/articles/10.1186/s13049-019-0683-6>. [COBISS.SI-ID 25017352], [JCR, SNIP]
3. O'VING, Iris, MASTERSON, Siobhán, TJELMELAND, Ingvild B. M., JONSSON, Martin, SEMERARO, Federico, RINGH, Mattias, TRUHLAR, Anatolij, CIMPOESU, Diana, FOLKE, Fredrik, BEESEMS, Stefanie G., et al., MARKOTA, Andrej (sodelavec pri raziskavi), STRNAD, Matej (sodelavec pri raziskavi), et al. First-response treatment after out-of-hospital cardiac arrest : a survey of current practices across 29 countries in Europe. *Scandinavian journal of trauma, resuscitation and emergency medicine*. 2019, vol. 27, str. [1]-20, ilustr. ISSN 1757-7241. <https://sjtrem.biomedcentral.com/track/pdf/10.1186/s13049-019-0689-0>, DOI: 10.1186/s13049-019-0689-0. [COBISS.SI-ID 6911295], [JCR, SNIP, WoS do 25. 11. 2020: št. citatov (TC): 2, čistih citatov (CI): 1, Scopus do 29. 7. 2020: št. citatov (TC): 1, čistih citatov (CI): 1]
4. STRNAD, Matej, LEŠNIK, Damjan, KRIŽMARIČ, Miljenko. Arterial blood gas changes during cardiac arrest and cardiopulmonary resuscitation combined with passive oxygenation/ventilation : a METI HPS study. *JIMR on-line*. 2018, vol. 46, iss. 11, str. 4605-4616. ISSN 1473-2300.

- <http://journals.sagepub.com/doi/pdf/10.1177/0300060518786916>, DOI: 10.1177/0300060518786916. [COBISS.SI-ID 512828984], [JCR, SNIP, WoS, Scopus]
5. PROSEN, Gregor, STRNAD, Matej, DONIGER, Stephanie J., MARKOTA, Andrej, STOŽER, Andraž, BOROVIK LESJAK, Vesna, MEKIŠ, Dušan. Cerebral tissue oximetry levels during prehospital management of cardiac arrest : a prospective observational study. *Resuscitation*. [Online ed.]. Aug. 2018, vol. 129, str. 141-145, ilustr. ISSN 1873-1570. <https://www.sciencedirect.com/science/article/pii/S0300957218302259?via%3Dihub>, DOI: 10.1016/j.resuscitation.2018.05.014. [COBISS.SI-ID 6385727], [JCR, SNIP, WoS do 12. 12. 2020: št. citatov (TC): 13, čistih citatov (CI): 13, Scopus do 29. 12. 2019: št. citatov (TC): 4, čistih citatov (CI): 4]
  6. PELCL, Tine, BOROVIK LESJAK, Vesna, VUJANOVIĆ, Vitka, STRNAD, Matej. Impact of prehospital rapid sequence intubation and mechanical ventilation on prehospital vital signs and outcome in trauma patients. *Signa vitae*. 2017, vol. 13, no. 1, str. 51-55. ISSN 1845-206X. <http://www.signavitae.com/wp-content/uploads/2017/04/sv13-n1-51-55.pdf>, DOI: 10.22514/SV131.042017.23 /. [COBISS.SI-ID 512719928], [JCR, SNIP, Scopus]
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