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| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Seminar iz biomedicinske tehnike | | | | | | | | | | | | | | |
| **Course title:** | | | Seminar: Biomedical Engineering | | | | | | | | | | | | | | |
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| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| Podiplomski magistrski študijski program druge stopnje Elektrotehnika | | | | | Biomedicinska tehnika | | | | | | | | 2 | | 1 | | |
| 2nd cycle masters study programme in Electrical Engineering | | | | | Biomedical Engineering | | | | | | | | 2 | | 1 | | |
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| **Vrsta predmeta / Course type** | | | | | | | | | | | | Obvezni-strokovni / Compulsory professional | | | | | |
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| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64282 | | | | | |
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| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| 15 |  | | | 60 | | |  | | | |  | | | 75 | |  | 6 |
|  | | | | | | | | | | | | | | | | | |
| **Nosilec predmeta / Lecturer:** | | | | | Damijan Miklavčič, Franjo Pernuš | | | | | | | | | | | | |
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| **Jeziki /**  **Languages:** | | **Predavanja / Lectures:** | | | | slovenski / Slovenian | | | | | | | | | | | |
| **Vaje / Tutorial:** | | | | slovenski / Slovenian | | | | | | | | | | | |
| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | | | | | | | | |  | **Prerequisits:** | | | | | | | |
| Vpis v letnik predmeta | | | | | | | | |  | Enrolment in the year of the course | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Identifikacija realnega problema s področja biomedicinske tehnike, izbor problema in reševanje. Zbiranje informacij in pregled dosedanjih rešitev izbranega ali podobnega problema. Predlog možnih rešitev in ocena različnih rešitev. Izvedba rešitve problema. Izdelava poročila. | | | | | | | |  | | Brief introduction to different topics and problems in Biomedical Engineering; selecting a research problem from the list of problems. Guided and supervised progression through various steps of the research project: problem study, literature overview, study of existing solutions, and proposal of novel solutions. The students will report in a written and oral form after each step. | | | | | | | |

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| **Temeljni literatura in viri / Readings:** | | | | | |
| 1. Wolfgang Birkfellner. Applied Medical Image Processing, Second Edition: A Basic Course. CRC Press; 2 edition, 2014. 2. Isaac Bankman. Handbook of Medical Image Processing and Analysis, Second Edition (Academic Press Series in Biomedical Engineering), Academic Press; 2 edition, 2008. 3. Michael Fitzpatrick and Milan Sonka. Handbook of Medical Imaging, Volume 2. Medical Image Processing and Analysis (Parts 1 and 2) (SPIE Press Monograph Vol. PM80/SC), SPIE Publications; Reprint edition, 2009. 4. Joseph D. Bronzino. The Biomedical Engineering Handbook. CRC Press, 2000. 5. 5. John Enderle, Joseph Bronzino. Introduction to Biomedical Engineering. Academic Press, 2012. | | | | | |
| **Cilji in kompetence:** | |  | | **Objectives and competences:** | |
| Priprava na samostojno razvojno delo pri diplomski nalogi | |  | | To prepare the students for independent research that will be required for completing the MS Thesis. | |
| **Predvideni študijski rezultati:** | | |  | **Intended learning outcomes:** | |
| Osvojiti osnovna znanja o fazah raziskovalnega dela: seznanitev s problemom, razumevanje problema, pregled in analiza literature, izbira in vrednotenje znanih rešitev ter izvirna rešitev problema. Poleg tega bodo študenti pridobivali tudi znanja o ustnem in pisnem poročanju. | | |  | To obtain basic knowledge about the different phases of research: study of a problem, understanding a problem, literature overview and analysis, selection and evaluation of state-of-the-art solutions and proposal of a novel solution. Besides, the students will master oral and written reporting. | |
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| **Metode poučevanja in učenja:** | | |  | **Learning and teaching methods:** | |
| Predavanje, mentorsko delo, samostojno delo. | | |  | Teaching, individual supervision, independent work. | |
| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | | | | **Assessment:** |
| Vmesna poročila in predstavitve Končno pisno poročilo in predstavitev | 30%  70% | | | | Intermediate reports and presentations  Final written report and presentation |
| **Reference nosilca / Lecturer's references:** | | | | | |
| 1. MARKELJ, Primož, TOMAŽEVIČ, Dejan, LIKAR, Boštjan, PERNUŠ, Franjo. A review of 3D/2D registration methods for image-guided interventions. Medical Image Analysis, 2012, vol. 16, no. 3, str. 642-661. 2. MITROVIĆ, Uroš, ŠPICLIN, Žiga, LIKAR, Boštjan, PERNUŠ, Franjo. 3D-2D registration of cerebral angiograms: a method and evaluation on clinical images. IEEE Tr Medical Imaging, 2013, vol. 32, no. 8, str. 1550-1563. 3. KOREZ, Robert, IBRAGIMOV, Bulat, LIKAR, Boštjan, PERNUŠ, Franjo, VRTOVEC, Tomaž. A framework for automated spine and vertebrae interpolation-based detection and model-based segmentation, IEEE Tr on Medical Imaging, 2015, vol. 34, no. 8, str. 1649-1662. 4. MIKLAVČIČ, Damijan, MALI, Barbara, KOS, Bor, HELLER, Richard, SERŠA, Gregor. Electrochemotherapy: from the drawing board into medical practice. *BioMedical engineering online*, 2014, vol. 13, no. 29. 5. HABERL MEGLIČ, Saša, MIKLAVČIČ, Damijan, SERŠA, Gregor, FREY, Wolfgang, RUBINSKY, Boris. Cell membrane electroporation. Part 2, The applications. *IEEE electrical insulation magazine*, 2013, vol. 29, no. 1, str. 29-37. | | | | | |