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| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Modul E: Zasnova in razvoj izdelkov | | | | | | | | | | | | | | |
| **Course title:** | | | Module E: Product Design and Development | | | | | | | | | | | | | | |
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| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| Univerzitetni študijski program prve stopnje Elektrotehnika | | | | | **Vse smeri** | | | | | | | | 3. | | letni | | |
| 1st cycle academic study programme Electrical Engineering | | | | | **All fields** | | | | | | | | **3.** | | **summer** | | |
|  | | | | | | | | | | | | | | | | | |
| **Vrsta predmeta / Course type** | | | | | | | | | | | | Izbirni – splošni/ elective general | | | | | |
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| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64143 | | | | | |
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| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| **30** |  | | | **30** | | |  | | | |  | | | **65** | |  | **5** |
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| **Nosilec predmeta / Lecturer:** | | | | | Boštjan Likar | | | | | | | | | | | | |
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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 študija. | | | | | | | | |  | Enrolment in the year of the course. | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Razvojni procesi in organizacijske strukture  Zaznavanje priložnosti  Načrtovanje izdelkov  Identifikacija potreb kupcev  Določanje lastnosti izdelkov  Tvorba, izbira in testiranje zamisli  Arhitektura izdelkov  Industrijsko oblikovanje  Oblikovanje za proizvodnjo  Prototipni izdelki  Robustno oblikovanje  Ekonomika razvoja izdelkov  Dizajn za okolje  Produktno vodenje  Podjetništvo | | | | | | | |  | | Development processes and organizations  Opportunity identification  Product planning  Identifying customer needs  Product specifications  Concept generation, selection and testing  Product architecture  Industrial design  Design for manufacturing  Prototyping  Robust design  Product development economics  Design for environment  Product management  Enterpreneurship | | | | | | | |

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| **Temeljni literatura in viri / Readings:** | | | |
| 1. Karl Ulrich, Steven Eppinger, Product Design and Development, McGraw-Hill, 2011 2. Elektronsko gradivo – prosojnice predavanj in navodila za vaje: <http://lit.fe.uni-lj.si/ZRI> | | | |
| **Cilji in kompetence:** |  | | **Objectives and competences:** |
| Namen predmeta je spoznati sistematičen pristop k razvoju novih izdelkov, ki obravnava področja trženja, tehnike, industrijskega oblikovanja, načrtovanja in organizacije ter jih poveže v celovit, kakovosten in inovativen razvojni proces. Praktična znanja študentje pridobijo s skupinskim projektnim delom, kjer si zamislijo, razvijejo in predstavijo nov prototipni izdelek ter utemeljijo njegove najpomembnejše konkurenčne prednosti. |  | | The aim of the subject is to introduce systematical methods for the development of new products by combining and integrating the fields of marketing, design, planning and manufacturing. Practical skills are gained via a team work in which the students propose a concept for a new product, develop a prototype and demonstrate its main competitive advantages. |
| **Predvideni študijski rezultati:** | |  | **Intended learning outcomes:** |
| Praktični postopki za boljše načrtovanje izdelkov, kreativno razvijanje zamisli in reševanje problemov, skupinsko delo, razumevanje in izboljševanje razvojnih in poslovnih procesov. | |  | Practical tools for better product planning, creative concept development and problem solving, team work experiences, understanding and improving development and business processes. |
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| **Metode poučevanja in učenja:** | |  | **Learning and teaching methods:** |
| Teoretični postopki so prikazani na različnih praktičnih in splošno znanih primerih izdelkov, od zelo enostavnih do zelo kompleksnih, tako da študentje dobijo vpogled v možnosti uporabe.  Nekatera predavanja izvajajo vabljeni predavatelji iz slovenske industrije in priložnostno tudi iz tujine.  Študentje s projektnim delom v manjših skupinah pripravijo predloge za nove izdelke, jih razvijejo do prototipne stopnje, javno predstavijo in utemeljijo njihove konkurenčne prednosti. | |  | Theoretical methods are illustrated on different practical and well-known products, ranging from simple to highly complex ones, so that the students get some insights into possible applications.  Some lectures are conducted by invited lecturers form domestic and possibly foreign industry.  The students work on their projects in small teams in which they propose concepts for new products, develop prototypes and publicly demonstrate their main competitive advantages. |

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| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | **Assessment:** |
| Ocenjevanje individualnih in skupinskih projektnih nalog med semestrom.  Predstavitev novega prototipnega izdelka ter utemeljitev glavnih konkurenčnih prednosti. | 80%  20% | Assessment of individual and team project tasks during the semester.  Presentation of new prototype product and demonstration of main competitive advantages. |
| **Reference nosilca / Lecturer's references:** | | |
| 1. Jaka Katrašnik, Franjo Pernuš in Boštjan Likar, A method for characterizing illumination systems for hyperspectral imaging, Optics Express, 21(4):4841-4853, 2013.  2. Miha Možina, Dejan Tomaževič, Franjo Pernuš in Boštjan Likar, Automated visual inspection of imprint quality of pharmaceutical tablets, Machine Vision and Applications, 24(1):66-73, 2013.  3. Jaka Katrašnik, Franjo Pernuš in Boštjan Likar, A survey of mobile robots for distribution power line inspection, IEEE Transactions on Power Delivery, 25(1):485-493, 2010.  4. Miran Bürmen, Franjo Pernuš in Boštjan Likar, High-speed precision weighing of pharmaceutical capsules, Measurement Science and Technology, 20(11):115203, 2009.  5. Boštjan Likar - razvojne in podjetniške reference: odgovorni nosilec osmih aplikativnih raziskovalnih projektov, razvijalec več kot 20 izdelkov z računalniškim vidom, soustanovitelj visokotehnološkega podjetja Sensum d.o.o. | | |