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| Course: | ***Renewable energy resources*** |
| Course id: 2MRR2I25 |
| Number of ECTS: 5 |
| Teacher: | Todor Janić |
| Course status | Elective |
| Number of active teaching classes (weekly) |
| Lectures:2 | Tutorials :2 | Other teaching types: | Study research work: | Other classes: |
| Precondition courses | None |
| 1. Educational goal

Acquiring the basic knowledge in production of energy crops, technologies of using agricultural residues for heat and electricity production and studying the basic technical characteristics of thermal and processing plants for renewable energy production. |
| 1. Educational outcomes

Students will be trained in the productionof energy cropsandthe technology of using agricultural residues for energy production purposes. |
| 1. Course content

*Theoretical instruction*Production of energy crops (poplar, willow, black locust, Sudan grass, cassava, topioca, cane, etc.), quantity, structure, calorific value and moisture content. Agricultural residues (straw, corn husk, sunflower seed husk, corn cobs, the remains of pruning fruit trees, vines, manure): volume, structure, calorific value and moisture content. Plants for producing energy briquettes and pellets from biomass. Thermal plants for renewable energy production: boilers, solar collectors, heat pumps, gas generators, plants for anaerobic productionof biogas, plants for production of biodiesel. Plants for production of bioethanol, wind-powered electrical generators, and facilities for using geothermal water. |
| 1. Teaching methods

Tutorials inlaboratories and exploitation tutorials. Calculation of the basic parameters of thermal plants, heat energy and electricity. |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Points | Final exam  | Points |
| Lecture attendance  | 5 | *Oral exam**Written exam* | 35+35 |
| Practical work | 5 |  |
| Tutorials attendance | 5 |
| Seminar paper | 15 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Obernberger, I, Thek, G | Herstellung und energetische Nutzung von Pellets  | Institut fur Prozesstechnik, Teshnische Universitat Graz | 2009 |
|  |  | Straw for Energy Production, Technology-Environment-Economy, brochure, | The Centre for Biomass Technology, Copenhagen, , Second Edition. ([www.sh.dk/~cbt](http://www.sh.dk/~cbt)). | 1998 |
|  | Duffie, J, Beckman, W. | Solar Energy Thermal Proces | John Wiley and Sons, New York. | 1974 |
|  | Wayne H. Smith | Biomass Energy Development | “Plenum Press”, New York and London. | 1985 |
|  | Lambic, M | Solar Walls, The Passive Solar Heating | University of Novi Sad, Technical Faculty “Mihajlo Pupin”, Zrenjanin | 1999 |
|  | Brkić, M | Termotehnika u poljoprivredi, | Poljoprivredni fakultet, Novi Sad | 2004 |
|  | Brkić, M, Janić, T, Somer, D. | Procesna tehnika i energetika | Poljoprivredni fakultet, Novi Sad | 2004 |
|  | Furman, T. i saradnici | Biodizel, monografija | Poljoprivredni fakultet, Novi Sad | 2005 |
|  | Brkić, M. i saradnici | Proizvodnja i korišćenje biogasa | Poljoprivredni fakultet, Novi Sad | 1992 |
|  | Lambić, M, Stoićević, D. | Solarna tehnika | Srbija solar, Zrenjanin | 2004 |
|  | Brkić, M, Janić, T | Briketiranje i peletiranje biomase, monografija | Poljoprivredni fakultet, Novi Sad | 2009 |