

**The Name of Institution:**

*Faculty of Electrical Engineering,  
University of Belgrade*

| <i>Description of an Individual Course Unit</i> |   |                         |               |                        |               |                      |   |
|---|---|-------------------------|---------------|------------------------|---------------|----------------------|---|
| <b>Course Code:</b>                             | OG4TPE  | <b>Level of Course:</b> | Undergraduate | <b>ECTS</b>            | <b>5</b><br>* | <b>Semestre</b><br>: | 1 |
| <b>Course Title:</b>                            | Thermal processes in electric power components  |                         |               | <b>Year of Study:</b>  |               | 4                    |   |
| <b>Prerequisites :</b>                          | None  |                         |               | <b>Type of course:</b> | Optional      |                      |   |
| <b>Lecturer(s):</b>                             | Dr Zoran Radaković  |                         |               |                        |               |                      |   |
| <b>Course Staff:</b>                            | Marko Šorgić, Jovan Trifunović, Mr. Nedžad Hadžiefendić   |                         |               |                        |               |                      |   |
| <b>Objective of the course:</b>                 | <ul style="list-style-type: none"><li>✓ Introduce students to fundamentals of heat and mass transfer.</li><li>✓ Understanding the mechanisms of temperature increase in electric power components due to different kind of power loss.</li><li>✓ Provide students with the ability to apply the knowledge from general heat and mass transfer theory to the design, operation, monitoring and protection of electric power components.</li><li>✓ Examples on real electric power components.</li></ul>                |                         |               |                        |               |                      |   |
| <b>Course Contents:</b>                         | Heat transfer by conduction, convection and radiation. Heat transfer by mass transfer.<br>Rated power of electric power components defined with allowed temperature of electrical insulation.<br>Kinds of the cooling of electric power components. Heat exchangers.<br>Examples of thermal calculations of electric power components.<br>Temperature measurement.<br>Type Heat-run tests.<br>Thermal aspects in practice of operation of electric power components (strategy of loading, monitoring and protection). |                         |               |                        |               |                      |   |
| <b>Teaching Methods:</b>                        | 28 hours of lectures + 14 hours of supervised problem classes, 14 hours of laboratory exercise; midterm tests.<br>Approximately 50 hours of personal study and exercise.  |                         |               |                        |               |                      |   |
| <b>Literature:</b>                              | <i>Problems in Electrical heating and Laboratory exercises</i> , Z. Radaković, M. Jovanović, Faculty of Electrical Engineering, Second edition, 1995.<br><i>Fundamentals of heat and mass transfer</i> , F.P.Incropera, D.P.DeWitt, John Wiley&Sons, Fifth edition, 2002.   |                         |               |                        |               |                      |   |
| <b>Assessment methods:</b>                      | <b>Exam</b> - Three-hour examination - two numerical problems to be solved (20 % each), plus two theoretical questions (20 % each), plus one question related to laboratory exercises (20 %). To pass the course, a mark of at least 55% must be achieved.<br><b>Midterm Tests</b> - replaces 50% of the exam (first part of the course).   |                         |               |                        |               |                      |   |
| <b>Language of instruction:</b>                 | Serbian   | <b>Date:</b>            | 17. 04. 2006. | <b>Signature:</b>      |               |                      |   |