SYLLABUS

1. Course title:

Basic thermography

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester:

1 7

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	1

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Power Mechanical Engineering

12. Lecturer:

Fikret Alić, Associate Professor

13. Lecturer's e-mail:

fikret.alic@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

The aim is to familiarize students with basic concepts and methods in thermography;
To introduce student with the thermal imaging, uses and treatment of thermograms by using modern software;
Active and passive thermography correlated with the numerical simulation need to supplement the understanding of processes and phenomena in the thermal fluid technology;

16. Learning outcomes:

After completion of the course students will be able to:
- analyze and assess which one of methods should be applied in real thermography, for real example
- make thermogram and establish certain anomalies in the same
- compare the results obtained by the simulation software with the thermogram obtained by thermal camera
- examine certain energy machines and identify anomalies in the work of the same

17. Course content:

Introduction to Infrared Thermography. Options for temperature measurement, the advantages and disadvantages of thermography. Electromagnetic spectrum and thermal radiation base. Visible and infrared portion. Law of radiation. Areas of application of thermography. Qualitative and quantitative thermography. Passive and active thermography. The use of passive and active thermography. And thermogram analysis techniques of thermograms. Way of determination of surface emissivity. Tools for thermogram environmental impact - reflection of radiation from the environment. The method of thermographic measurements. Object- thermographic measurement objective. The apparent reflected temperature. Comparison of thermographic testing and numerical modeling. Types of thermal camera. The influential parameters on the thermogram. Thermographic report. Thermography and thermal technical systems. Thermography: The mechanical components and systems. Non-destructive testing. Research and development.

18. Learning methods:

For the purpose of effective teaching and to achieve the objectives of the course and competence of students during the course will be used the following methods:
• lectures using multimedia resources with active participation and discussion of students,
• Preparation and elaboration of cases in laboratory
• Presentation in the real environment.

19. Assessment methods:

After half of the semester, students take the writing test, which includes previously treated topics with lectures. The test consists of a group of multiple-choice questions, the group questions the simple recall and group essay type questions. Student total in the first test can achieve 20 points. The test is taken by all students in the course at the same time thereby achieving uniformity of the level of knowledge that is being tested, as well as the conditions in which the student takes the exam.
Also after the second half semester students take the written test for the second part of the topics covered during lectures. The test is scored as the first test with 20 points.
The final exam is oral. Right to take the final exam is given to students who have achieved at each of the previous ways of testing a minimum of 50% points of the total number that can be achieved.
At the oral exam students answer three questions drawn from the program of the subject treated in class. Oral exam can be taken if a student answers to all three questions. The maximum number of points a student can achieve at the oral exam is 50 points.
Checks on all forms of knowledge are recognized as a cumulative exam if the achieved result is positive after each individual test and at least 50% of the total scheduled or required knowledge and skills.
In order for the student to pass the subject must achieve a minimum of 54 cumulative points of which a minimum of 25 points on the final exam.

20. Assessment components:

Rating exam is based on the total number of credits a student gained fulfilling exam prerequisites and passing exams and contains a maximum of 100 points, according to the following scale
Students' obligations Points
Presence in classes 10
Test I 20
Test II 20
Total prerequisites given 50
Final Exam 25-50

21. Required reading list:

1.Andrassy A., Boras I., Švaić S. (2010) Osnove termografije s primjenom, Zagreb, FSB
2. Holman J.P. (2008) Heat Transfer, International Student Edition, Mc Graw-Hill.

22. Web sources:

http://www.energy.gov/energysaver/articles/thermographic-inspections

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015.