SYLLABUS

1. Course title:

Heat and mass transfer I

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

5

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester:

1 5

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 1

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 main objective of the course is to familiarize students with the basic mechanisms of heat exchange: conduction, convection, radiation, combined heat transfer, heat transfer with phase change, laws and principles of processes with humid air, the theory of dextrorotatory cycle. Students acquire knowledge of modern structures of the heat exchanger, the principles of mass transfer, binary solution.

16. Learning outcomes:

Identifies the basic principles and laws of the mechanisms of heat and mass transfer.
Estimates, measures and methods to promote the exchange of heat and mass.
Examine and analyze the necessary measurements in order to obtain the required data on thermal power transmission or device.
Re-examine their knowledge in the wet air (drying and air conditioning), as well as in cooling and heating processes.

17. Course content:

Keynote lecture (conduction, convection). Temperature field. Fourier's law. Heat conduction. The temperature field of the board. Boundary conditions. Temperature of the cylinder box. A temperature field of the sphere. The overall heat transfer coefficient. Introductory lecture. Heat transfer of the fin surfaces. Basic mechanisms of mass transfer by convection. Diffusion in the gaseous environment. Stefan's equation. Dimensionless heat conduction. Analysis of Boundary Layer. The current balance and energy balance. Similarity. II Fick's law. Unsteady transiently warms.

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 with students,
• Preparation and presentation problems during auditory exercises and individual and team / group labs,
• 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, groups of questions for easy recall and group essay type questions. Student total in the first test can achieve 25 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 25 points.
The final exam is oral. The right exit on 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 45 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 5
25 Test I
Test II 25
Total prerequisites given 55
Final Exam 25-45

21. Required reading list:

1.Leinhard,J.H.IV, Leinhard,J.H.V(2008) A Heat Transfer Textbook, Cambridge, Phloginston Press
2. Brodkey, R.S., Hershey, H.C.(2001) Transport Phenomena, New York, McGraw Hill
3. E.Ganić (2005) Prenos toplote i mase, Sarajevo, Svjetlost

22. Web sources:

http://www.efunda.com/formulae/heat_transfer/home/overview.cfm
http://energy.concord.org/energy2d/

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015