SYLLABUS

1. Course title:

Heating and air conditioning

2. Code:

do not fill

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

no

7. Class restrictions:

completed seminar work and project assignment

8. Duration / semester:

1 7

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 1

9.3. Laboratory/Practice classes: 0

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Energy department

12. Lecturer:

Ph.D. Sandira Eljsan, professor

13. Lecturer's e-mail:

sandira.eljsan@untz.ba

14. Web site:

www.untz.ba

15. Course aims:

Getting of theoretical knowledge and practical skills as well as adopting basic methods for solving simple problems of heating and air conditioning.

16. Learning outcomes:

-At the end of completion of the course is expected to know how to differentiate between heating systems;
-Identify basic elements of heating and air conditioning as well as basic heating schemes;
-Calculate and design simpler practical problems of heating and air conditioning;
-Compare the advantages and disadvantages of different heating systems

17. Course content:

- Introduction. Meteorological - climatic factors and their impact on heating and air conditioning.
- Thermal comfort climate.
- Thermo-physical properties of construction materials.
- The installation of elements, features, and performance calculations.
- Heating body, classification . The boiler in the heating system.
- Pipe network. Gravity heating systems. Pumping, alternative central heating systems.
- Two-pipe and one-pipe systems gravity heating.
- Surface heating. Panel heating. Floor heating.
- Steam heating. Heating gas. The control system of central heating.
- District heating of the city. Substations.
-Heating heat pump, low energy houses, "passive house. Solar heating .
-Basics of ventilation and air-conditioning. The classification of the climate system.
- The basic elements of air conditioning. Regulation and control.

18. Learning methods:

- Lectures using multimedia resources, techniques of active learning and with the active participation and discussion of students;
- Preparation and presentation of group and individual seminar works.
- exercises in combination with at least two visits (Power Plant and Central heating in Tuzla) during the semester, where students will be familiar with the ways of preparing water network Power Plant in as well as ways of district heating.

19. Assessment methods:

- As part of the pre-exam students are required to make individual or group seminar that will cover specific topics from the contents of the subject theory and then presented orally. In the preparation and presentation of group seminar work involved all students groups, whose participation is valorized individually. For done and presented seminars student can achieve from 0 to 10 points.
- Also, the project task on exercises throughout the semester, the student can achieve up to 24 points (12 for heating and air conditioning)
- As prerequisites given to submit two reports on visits in the plant (10 points). Total to 50 points.
- After finished pre-exam at the end of the semester the student approach the final exam and writing the tests covering the topics treated with exercises of heating and air conditioning. The student can achieve a maximum of 25 points. After the written exam is oral exam. The right exit on the final exam is given to students who are from the written test to get 50% of the total anticipated points. At the oral exam students answer three questions from the program of the subject treated in lectures and exercises. The maximum number of points a student can achieve at the oral exam is 25.

20. Assessment components:

Exam consists of up to 50 points:
- The attendance of teaching: 3 points of lectures and 3 points of exercises = 6 points
- Reports of two visits: 2x5 = 10 points
- Seminar work :10 points
- Graphic work with exercises: 24 points (12 heating i 12 Air Condition)

-The first final exam or second exam: 50 points (25 exercises and 25 theory)

21. Required reading list:

1. Recknagel, Sprenger, Schrame, Čeperković: Grejanje i klimatizacija 05/06, Zagreb 2005.
2. Todorović B.: Projektovanje postrojenja za centralno grijanje; Beograd 2005.
3. Eljšan S: Tehnika grijanje, Tuzla 2009.

22. Web sources:

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015