SYLLABUS

1. Course title:

ENERGY UTILIZATION OF BIOMASS FROM AGRICULTURE

2. Code:

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

No prerequisites

7. Class restrictions:

No class restrictions

8. Duration / semester:

1 6

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 2

10. Faculty:

Faculty of Technology

11. Department/study program:

Agronomy

12. Lecturer:

Franc Andrejaš, associate professor

13. Lecturer's e-mail:

franc.andrejas@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

Acquisition of knowledge in the area of production and consumption of biomass and biofuels from agriculture, disposal of organic waste through production of heat and electricity, biofuel production technology, and analysis of the possibilities of incorporating renewable energy into the system of agricultural production.

16. Learning outcomes:

After the full accomplishment of the course, as envisaged in the course syllabus, students are expected to be able to:
- with certainty to distinguish renewable and unconventional sources of energy;
- identify the possibilities of applying renewable energy sources, in particular biomass, in agricultural production;
- describe the technology of energy production, especially biomass
- arguably discuss the advantages and disadvantages of individual energy sources;
- systematize types of raw materials and types of biofuels in the context of agricultural production;
- identify the importance of using biomass and biofuels for environmental protection.

17. Course content:

Introduction to the course. Presentation of the study area. Production and energy consumption as the determinant of society development. Natural cycles - renewable and non-renewable energy sources. Energy and Environment. Energy and climate. Fuels and non-aggressive substances, fuel characteristics, fuel combustion processes. The role of energy in agricultural production. Biomass, a source of energy. Distribution and efficiency. Sources of biomass.
Recapitulation. TEST
Production of biomass energy - state of technology. Technological procedures: thermal treatment, chemical processes in dry systems; Chemical processes in liquid and combined systems. First and Second Generation Biofuels. Treatment of waste streams.
Recapitulation. TEST

18. Learning methods:

Lectures, laboratory exercises, field teaching, group and individual consultations. Lectures will be multimedia supported when appropriate, with the expected active participation of students in the discussion. The exercises will be conducted in interactive form, through the practical execution of laboratory experiments. Visits to relevant economic and other organizations will demonstrate the link between theory and practice. Consultations will facilitate and deepen understanding of the subject matter.

19. Assessment methods:

Throughout the course, students are required to attend lectures and exercises on a regular basis, which will be monitored by the subject teacher and associates and, on special forms, keep records. During the semester, the student can be absent from a maximum of three lectures and three exercises, being obliged to bring proof of justification of absence (medical certificate, etc.). In the case of more unexcused absences, the student loses the right to the signature of the teacher.

• TESTS - Two tests throughout the semester. Each test consists of a maximum of 20 short theoretical questions related to the previously processed material and carries 20 points (for a passing grade, one should achieve a minimum of 11 points). Tests are usually conducted after every six weeks of instruction, whereby the subject teacher will announce them to the students at least two weeks before each test.

LABORATORY EXERCISES: the student is obliged to do all laboratory exercises, and based on activity in exercises can achieve a maximum of 25 points (for a passing grade should achieve a minimum of 13 points).

• FINAL PART OF THE EXAM - Students who have collected the minimum required number of points for the pass grade (54 points) by all criteria, have the right on deserved grade or to use the option of additional (verbally or in writing exam) for a higher final grade. The maximum number of points that can be obtained on the final exam is 30. The minimum number of points, which must be reached on the final exam is 18.

All the students who did not meet the conditions in one of the tests or who are not satisfied with the grade, but who have completed all other obligations of the course (have the signature of the subject teacher in the index) take the final exam. The student can not get a final grade if he has not passed both tests.

20. Assessment components:

The final grade is based on the total number of points obtained through pre-requisites and the final exam, according to the quality of the acquired knowledge and skills. It has a maximum of 100 points, according to the following scale:
Regularity of teaching attendance (lectures + exercises): 5 points
Activity in laboratory exercises: 25 points
Tests (theory): 40 points
Final Exam: 30 points

21. Required reading list:

1. F.Andrejaš, Tehničko-tehnološki aspekti energetske valorizacije otpadne biomase: disertacija, Univerzitet u Tuzli, 2007.
2. M.Đonlagić, N Đonlagić, J.Sadadinović, F.Andrejaš, Alternativni izvori energije – Biomasa, Univerzitet u Tuzli, 2004.

22. Web sources:

http://www1.eere.energy.gov/biomass/
http://www.nrel.gov/biomass/
http://www.energyquest.ca.gov/story

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session: