SYLLABUS

1. Course title:

Management of waste materials of chemical industry

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

No prerequisites

7. Class restrictions:

No class restrictions

8. Duration / semester:

1 5

9. Weekly contact hours:

9.1. Lectures: 2

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of Technology

11. Department/study program:

Chemical Engineering and Technologies / Chemical Engineering and Technology

12. Lecturer:

Vahida Selimbašić, full professor

13. Lecturer's e-mail:

vahida.selimbasic@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

The educational aim of the course is to introduce students with basic environmental principles, when it comes to waste and nus products of the chemical industry, as well as their impact on the environment. One of the aims is the application of environmental principles in the treatment of waste streams of organic and inorganic industries. Throughout the teaching process, students will be familiar with waste materials, management of byproducts in the chemical industry, the way of using byproducts and waste materials and protecting the environment.

16. Learning outcomes:

At the end of the semester/course successful students, who during the entire period of teaching continuously performed their duties, will be able to:
1. understand the importance of this course in solving various environmental problems in the chemical industry,
2. pass the exam through a tests or pass the final exam in the first examination period at the end of the semester.

17. Course content:

Pollution of the chemical industry. Types of waste from the chemical industry (dangerous, inert, etc.). Emissions into air, water and soil. Management, ie waste management based on the principles of the protection of the environment of international law and best practice in the world. Methods of analysis of different types of waste for processing, ie disposal. Reduction of waste as an element of sustainable development. Identification of waste at the source of production as a preventative measure in the manufacturing processes of chemical industry. Application of the methodology of cleaner production. An analysis of the chemical industry's production units and the key points for the emergence of certain types of waste. Life cycle assessment (LCA), which encompasses the overall impact of the product on the environment throughout the life cycle of the product. Impact of chemical industry products on the environment, through stages of production and use. Case study, especially from the organic chemical industry as an indicator of the method of processing and disposing of waste, methods of processing. An overview of air and water protection against pollution.

18. Learning methods:

Teaching methods are based on multimedia lectures and laboratory exercises. Lectures provide the framework problems and analyze the facts and theoretical approaches to the problem, and at exercises, teaching is done in interactive form and through practical work within laboratory exercises. Teaching methods imply active student participation, laboratory work and visits to manufacturing and service organizations.

19. Assessment methods:

Throughout the course, students are required to regularly attend lectures and exercises. Students' attendance records will be regularly kept. On a special form, the course teacher will continuously monitor the presence of each student. 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, for the oral part of the exam. Each test consists of 20 short theoretical questions related to the previously processed material and carries 15 points (for a passing grade, one should achieve a minimum of 8 points). Tests are usually conducted after every six weeks of classes, 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 12 points).

• FINAL PART OF THE EXAM - Students who have collected the required number of points by all criteria (54 points), have 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 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 all the tests.

• SEMINAR WORK OF STUDENTS: student has the opportunity to do one seminar work. Successfully prepared and verbaly performed seminar work is evaluated with a maximum of 10 points (minimum 6 points), which are added to the total number of points achieved on other bases, in the formation of the final grade.

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 contains a maximum of 100 points, according to the following scale:
Regularity of teaching attendance (lectures + exercises): 5 points
Activity at laboratory exercises: 25 points
Tests (theory): 30 points
Seminar paper: 10 points
Final exam: 30 points

21. Required reading list:

Đuković J (1990). Zaštita životne okoline. Svjetlost, Sarajevo.
Allen D, Rosselot K (1997). Pollution Prevention for Chemical Processes, John Wiley & Sons Inc.
Jašić M, i sar, (2013). Održive tehnologije i hemijska industrija.

22. Web sources:

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: