SYLLABUS

1. Course title:

CHEMICAL REACTORS

2. Code:

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures: 4

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of Technology

11. Department/study program:

Chemical Engineering and Technologies / Chemistry and Engineering of Materials

12. Lecturer:

Dr. Ivan Petric, PhD, Associate Professor

13. Lecturer's e-mail:

ivan.petric@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

- students to be familiar with the basics and analysis of phenomena with chemical reactors,
- students to be familiar with the numerical software package POLYMATH in solving problems in the field of chemical reactors,
- students learn how to solve problems in the field of chemical reactors.

16. Learning outcomes:

After the successful completion of the learning process, the student is expected to know, understand and be able to:
- review, evaluate and differentiate different principles demonstrated through teaching,
- solve different weight-weighted problems with or without application of the numerical software package Polymath,
- analyzes the available literature for solving various problems of this course.

17. Course content:

1. INTRODUCTION (Significance and role of chemical reactors in the process). 2. KINETICS OF HOMOGENEOUS REACTIONS (Different definitions of reaction rate. Reaction rate equations.). 3. STOICHIOMETRY FOR BATCH AND FLOW REACTORS (Limiting reactant. Conversion. Reactions without Change and volume change of system volume. Reactions with phase change). 4. ISOTHERMAL REACTORS FOR SINGLE REACTIONS (Mathematical models of basic reactor types. Reactor with recirculation flow. Reactors for autocatalytic reactions). 5. REACTOR COMBINATIONS (Serial and parallel connection of reactors.). 6. ISOTHERMAL REACTORS FOR MULTIPLE REACTIONS (Yield and selectivity. Maximization of the desired product. problem-solving algorithm with multiple reactions). 7. NON-ISOTHERMAL REACTORS (Energy balances for different types of reactor for single and multiple reactions).

18. Learning methods:

- lectures with active participation and discussion of students,
- experimental exercises (Numerical Software Package Polymath, Interactive Computer Modules),
- consultations.

19. Assessment methods:

After approximately every five weeks in the semester, students take one Quiz, Test-Theory and Test-calculation problem, which cover up to date the topic from lectures and exercises. During the semester, three Quizzes, three Tests-theory and three Tests-calculation problem will be organized. The professor will promptly notify students of the terms of each test of knowledge. For each Quiz, Test-theory, and Test-calculation problem, a student must achieve at least 50% of the total points predicted for specific test of knowledge. Quizzes are taken through interactive computer modules (Kinetic Challenge 2, Kinetic Challenge 1, Heat Effects 1). The Tests-theory and the Tests-calculation problem are taken in writing. Each Test-theory is consisted of 20 short theoretical questions related to the material being studied. Each Test-calculation problem consists of one problem with several items to be solved. The final exam can be organized in writing and orally, depending on the number of points awarded.

20. Assessment components:

The exam score is based on the total number of points that a student has accomplished by completing the preexamination commitments and taking the exam, and it contains a maximum of 100 points, and is determined as follows: attendance and activity (4 points), Quizzes (each 6 points) , Tests-Theory (each 10 points), Tests-calculation problems (10 each), Final Exam (18 points). In order to pass the course, a student has to accomplish at least 54 points.

21. Required reading list:

1. Missen, R. W., Mims, C. A., Saville B. A. (1999): Introduction to Chemical Reaction Engineering and Kinetics, John Wiley & Sons, Inc., New York
2. Harriot, P. (2003): Chemical Reactor Design, Marcel Dekker, Inc., New York

22. Web sources:

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: