SYLLABUS

1. Course title:

Catalysis and Catalysts

2. Code:

3. Cycle of study:

1

4. ECTS credits:

5

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

Physical Chemistry

7. Class restrictions:

No

8. Duration / semester:

1 5

9. Weekly contact hours:

9.1. Lectures:	3
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	1

10. Faculty:

Faculty of Tehnology

11. Department/study program:

Chemical Engineering and Technologies

12. Lecturer:

13. Lecturer's e-mail:

14. Web site:

www.tf.untz.ba

15. Course aims:

Teach the students the basic concepts important to the talents.
Provide them for the synthesis of new catalysts that will be activated at favorable conditions in terms of temperature and pressure, while being more selective and stable. To acquire knowledge important for the physico-chemical characterization of the catalyst.

16. Learning outcomes:

Encourage the students to learn independently and develop critical thinking. Specific competencies will include application of gained knowledge and the ability of independent planning of research related to catalytic reaction engineering.

17. Course content:

1. Introduction. Homogeneous catalysis: acid-base, catalysis with metal ions.
2. Kinetics and mechanisms of homogenous catalytic reactions.
3. Heterogeneous catalysis.
4. Composition and Preparation of Catalysts.
5. Physical adsorption and hemisorption.
6. Kinetics and mechanism of heterogeneous catalytic reactions: empirical and mechanistic models.
7. Total speed of heterogeneous catalytic reactions. Transmission of matter and heat in catalytic reactors.
8. Effectiveness: Interphase, Intraphase. Experimental methods and criteria in kinetic research.
9. Activity, selectivity and stability of the catalyst.
10. Catalytic deactivation. Kinetics and mechanism of deactivation. Diffusion and deactivation.
11. Selectivity and deactivation.
12. Prevent deactivation and reactivation of catalyst.
13. Physical properties of the catalyst. Mechanical properties of the catalyst.
14. Experimental methods of determining physical and mechanical properties.
15. The role of catalysis in the development of sustainable technologies.

18. Learning methods:

Lectures
Experimental exercises
Seminar papers

19. Assessment methods:

The student during the course of the lecture mandatory approach to the first and second partial exam of the theoretical part, the defense of the seminar paper and passing the final exam. Each student has his own self seminar paper.
Students who have passed the first and second partial of the theoretical part of the material with maximum points and exceptionally completed seminar paper, the teacher entered a rating in the index after the completion of all obligations (the signature of the Professor in the index).
Final exam accessing all the students who have done all the obligations on the case (proof is the signature of the Professor in the index).
Results will be published on the notice board of the Faculty within 2-8 days.

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:
1. Presentation of lectures and exercises: 5 points
2. Exit colloquium: 10 points
3. Partial test: 25 points (minimum number of points 13)
4. II partial test: 25 points (minimum number of points 13)
5. Final Exam: 35 points

21. Required reading list:

S. Zrnčević, KATALIZA I KATALIZATORI, HINUS, 2005.
Catalysis Concepts and Green Applications, G. Rothenberg, Wiley-VCH, 2008, Weinheim.
Green Chemistry and Catalysis, R. A. Scheldon, I. Arends, U. Hanefeld, Wiley-VCH, 2007, Weinheim, Germany.

22. Web sources:

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: