Course Title:	**Conversion processes in the petroleum and petrochemical industry**
Lecturer:	Prof. Katica Sertić-Bionda, Ph.D.
Course Type:	Compulsory
ECTS:	6
Total Hours:	30 hours
Content of the Course:	The course covers the key refinery processes, their significance and impact on final products. Each separate process is considered from several aspects: thermodynamics, kinetics, the impact of raw materials and process variables as well as new catalysts and process implementation. The content of the course enables the acquisition of useful knowledge for process monitoring and control with the aim of obtaining products of required applicable and environmental properties.
Competences:	During the course the students will: • Learn the fundamental engineering aspects of process implementation with a special emphasis on specific performance and characteristics of catalysts, • Learn to differentiate the roles of each process from the aspect of applicable and environmental requirements for final products, • Integrate theoretical and practical knowledge of the computer-assisted process by monitoring of the impact of process variables on the product composition.
Teaching Methodology:	Lectures, seminars, practical exercises
Course Units:	Improvement of gasoline quality: catalytic reforming, isomerisation, alkylation, ether production (MTBE, ETBE...). Conversion of vacuum gas oil: fluid catalytic cracking (FCC). Conversion of distillation residue: residue fluid catalytic cracking (RFCC); hydrocracking; visbreaking; coking; partial oxidation (syngas). Sources and processing of acidic refinery gases. The production of sulphur (Claus process). Processes of hydrotreating. Hydrodesulphurisation (HDS); the possibility of integration with the separation processes of desulphurisation (adsorption, extraction). Hydrocracking: the division according to the process conditions, raw materials and products; hydrocracking of heavy residues; processes of hydrocracking in biofuel production (renewable diesel). Hydrogen: processes of production and separation; application in the petroleum and petrochemical industry (HDS, hydrocracking, Fischer-Tropsch synthesis, ammonium production). Sources of olefin and aromatic hydrocarbons in the petrochemical industry; FCC, steam cracking, catalytic reforming.
Examination Method:	Seminar, oral exam
References:	1. S. D. Raseev, Thermal and Catalytic Processes in Petroleum Refining, Marcel Dekker, New York, 2003. 2. J.G. Speight, Petroleum Refining Processes, Marcel Dekker, New York, 2002. 3. P. Leprince, Petroleum Refining, Conversion Processes, Vol. 3, Editions Technip, Paris, 2001. 4. David S. J. Jones and Peter R. Pujadó, Handbook of Petroleum Processing, Springer, 2006. 5. J. Ancheyta, Modelling and Simulation of Catalytic Reactors for Petroleum Refining, J.Wiley & Sons, Hoboken, 2011.
Course in English:	Yes
Quality Monitoring Method:	Course quality and performance monitoring in accordance with the quality management system of the University of Zagreb. Self-evaluation of lecturers and student poll.