

Course Name: Introduction to Petroleum Refining

Course Overview:

Level of study	Bachelor Degree
Workload	ECTS: 2/2 Total Hours: 72/72 Contact Hours: 32/32 <ul style="list-style-type: none"> • Lectures: 32/32 • Labs: – • Seminars: –
Course Code	B1.V2/B1.V2.1
Semester	Winter/Summer
Prerequisites	B1.B3 Foreign Language (English) B3.V3 Introduction to engineering practice
Course Objectives	<ul style="list-style-type: none"> • Formation of capability to apply knowledge in theoretical basics of petroleum refining processes for professional activity and education work. • Formation of capability to understand and apply basic terms for work in English speaking environment, preparation of documentation in English, presentation of results of professional activity in English.
Learning Outcomes	At the end of the course student will: <ul style="list-style-type: none"> • know fundamentals of petroleum refining, types of energy resources, fundamentals of crude oil treatment and natural gas processing, fundamentals and purposes of re-refining processes and properties of main oil products. • be able to understand oral speech in the field of petroleum refining. • be able to prepare and deliver oral reports on the professional topics (petroleum refining).
Syllabus	Winter Term Unit 1. Crude oil: composition, classification, properties, origin. Crude oil. Origin of oil. World oil reserves. Elementary, chemical, fractional composition of crude oil. Classification of crude oil. Physical and chemical properties of crude oil. Unit 2. Natural gas: origin, composition, properties. Natural gas. Origin of natural gas. World natural gas reserves. Natural gas uses. Composition of natural gas. Impurities found in natural gas. Chemical and physical properties of natural gas. Unit 3. Coal: formation, composition, classification, properties. Coal. World coal reserves. Coal mining. Coal formation. Coal components. Coal physical parameters. Coal ranks. Coal uses.

	<p>Unit 4. Biofuels: raw materials, production, types Biofuels and bioenergy. Demand for biofuels. Uses of biomass. Raw materials for biofuels. Types of biofuels. Liquid biofuels for transport. Second-generation biofuels.</p> <p>Unit 5. Alternative Fuels: sources, production, types. Alternative fuels. Types of alternative fuels (liquefied petroleum gas, compressed natural gas, methanol, ethanol, biodiesel, electricity, hydrogen).</p> <p>Summer Term</p> <p>Unit 1. Fundamentals of crude oil treatment. Scheme of crude oil treatment. Desalting and dehydration of crude oil. Storage tanks and other field facilities.</p> <p>Unit 2. Fundamentals of natural gas processing. Gas-sweetening processes. Gas dehydration. Recovery, separation and fractionation of natural gas liquids. Theory of gas-oil separation. Methods of separation. Gas-oil separation equipment.</p> <p>Unit 3. Fractionation of oil. Fractions of oil, properties, uses. Methods of oil fractionation. Equipment for oil fractionation. Atmospheric distillation of crude oil. Vacuum distillation of crude oil.</p> <p>Unit 4. Oil Re-Refining Process. Classification of the refining processes. Physical separation processes. Chemical catalytic conversion Processes. Thermal chemical conversion processes.</p> <p>Unit 5. Refinery Configuration. Configuration of the modern refinery. Factors influence the configuration of modern refinery: types of products, environmental regulation, crude assay and quality, refinery-petrochemical integration, development of new technology.</p> <p>Unit 6. Trade oil products. Refinery products composition. Liquefied petroleum gas. Gasoline. Kerosene. Diesel fuel. Jet fuel. Fuel oil. Residual fuel oil. Lube oil. Asphalt. Petroleum coke.</p>
Labs	–
Projects	–
Assessment	Credit Test (Pass/Fail)/ Credit Test (Pass/Fail)
Resources	<p>Textbooks:</p> <ol style="list-style-type: none"> 1. Fahim M.A., Sakhaf T.A., Elkilani A.S. Fundamentals of Petroleum Refining: – First Edition. – Elsevier. – 2010. – 485 p. 2. Chaudhuri U.R. Fundamentals of Petroleum and Petrochemical Engineering. – CRC Press. – 2011. – 406 p. 3. Devold H. Oil and gas production handbook. – SRH Media. – 2013. – 340 p. 4. Meyers Robert A. (ed.) Handbook of petroleum refining processes. 3-

	<p>rd edition. McGraw-Hill Professional. – 2003. – 847 p.</p> <ol style="list-style-type: none"> 5. An introduction to petroleum refining and the production of ultra low sulfur gasoline and diesel fuel. –ICCT. – 2001. – 89 p. 6. Silyn-Roberts H. Writing for Science and Engineering: Papers, Presentations and Reports.– Elsevier Ltd. – 2013. – 208 p. 7. Berger Robert E. A Scientific Approach to Writing for Engineers and Scientists. – Piscataway, NJ: Wiley. – 2014. – 232 p. 8. Murphy R. English Grammar in Use. 4th edition. – Cambridge. – 2012. – 299 p. <p>Source links:</p> <ol style="list-style-type: none"> 1. http://www.scopus.com. 2. http://www.webofknowlege.com. 3. http://www.sciencedirect.ru. <p>Video:</p> <ol style="list-style-type: none"> 1. Popular Petroleum Videos Ссылка доступа: http://www.youtube.com/watch?v=8W8SW98-sXQ&list=PL4MMogccZFXBbHdxy_xCtkP3m4yZ7f4kD.
Instructors	<p>Maria V. Kirgina http://portal.tpu.ru/SHARED/m/MKIRGINA/eng</p>