



## COURSE DATASHEET

<b>Semester:</b>	2013/14/1
<b>Course:</b>	Hydrocarbons and petrochemical technologies
<b>Code:</b>	VEMKOLB143A
<b>Responsible department:</b>	Department of Hydrocarbon and Coal Processing
<b>Department code:</b>	MKOL
<b>Responsible instructor:</b>	Dr. Jenő Hancsók

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### Course objectives:

To give an overall view of the hydrocarbon industry its products and calculation methods

### Course content:

1. E.: Hydrocarbon industry. Overall view of a refinery. Products of the hydrocarbon industry. Motor fuels.  
Gy.: Comparison of the hydrocarbon mixtures with simple mixtures. Property estimation of hydrocarbon mixtures (empirical, semiempirical methods; nomograms, computer simulation packages).
2. E.: Formation of the petroleum and natural gas. Exploration, drilling, production. Classification of crude oils.  
Gy.: ASTM distillation, densities of petroleum products.
3. E.: Energy sources, reserves, exploration.  
Gy.: True boiling point distillation, mid-yield curves, property-yield curves, iso-curves.
4. E.: Separation processes of crude oil processing (Distillation, extraction, ...).  
Gy.: Average boiling points. Characterization factor. Molecular weight of petroleum fractions. API density. Estimation of these parameters.
5. E.: Conversion technologies and their classification in the hydrocarbon industry. Thermal conversion technologies.  
Gy.: Phase envelope of defined mixtures. Phase diagram of petroleum fractions. Retrograde phenomena. Critical and pseudocritical properties. Corresponding state.
6. E.: Catalytic conversion technologies I. Heteroatom removing.  
Gy.: Equilibrium flash vaporization curves. Relations among the distillation curves, their application.
7. E.: Catalytic conversion technologies II. Oligomerization, alkylation.  
Gy.: Estimation of distillation curves
8. E.: Catalytic conversion technologies III. Isomerization, ether production.  
Gy.: Equilibrium flash vaporization curves at sub- and superatmospheric pressures.
9. E.: Catalytic conversion technologies IV. Naphtha reforming, HVGO FCC.  
Gy.: Estimation of liquid and vapour densities
10. E.: Catalytic conversion technologies V. Hydrocracking.  
Gy.: Calculation of vapour-liquid equilibrium
11. E.: Base oils and additives  
Gy.: Calculation of vapour-liquid equilibrium



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### Course content:

12. E.: Product blending

Gy.: Enthalpy and heat of vaporisation of hydrocarbon mixtures. Enthalpy diagrams.

13. E.: Raw materials and feedstocks of petrochemical industry. Intermediates and monomers and polymers.

Production of olefins (dehydrogenation, steam cracking, ...).

Gy.: Enthalpy and heat of vaporisation of hydrocarbon mixtures. Enthalpy diagrams.

14. E.: Polymers I.-II.

Gy.: Blending of petroleum products

### Requirements, evaluation and grading:

#### Requirements:

Participation on the lectures not compulsory, but it is recommended. The participation on the practical courses is compulsory. One exam paper writing during the semester. Scoring based on the following method: exam (theoretical part) 80%, exam (practical part) 12%, exam during the semester 8%.

#### Possibilities for repeating the subject:

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#### Learning efforts necessary to satisfy the requirements of the subject:

Attend lectures + seminar: 42 hours; preparations for examination individually: 28 hours

#### Required and recommended readings:

Kötelező és ajánlott irodalom: Hancsók, J., Baladincz, J., Magyar, J. (szerkesztők): „Mobilitás és környezet”, gyűjteményes kiadvány, 2008, Pannon Egyetemi Kiadó, Veszprém (ISBN: 978-963-9696-50-1), 240 oldal  
Hancsók, J.: „Korszerű motor és sugárhajtómű üzemanyagok I. Motorbenzinek”, Tankönyv, 1997, Veszprémi Egyetemi Kiadó, Veszprém (ISBN 963 7332 74 X), 219 oldal  
Hancsók, J.: „Korszerű motor és sugárhajtómű üzemanyagok II. Dízelgázolajok”, Tankönyv, 1999, Veszprémi Egyetemi Kiadó, Veszprém (ISBN 963 9220 27 2) 363 oldal  
Auer, J, Borsi, Z., Hancsók, J., Lakics, L-né., Lenti, M., Nemesnyik, Á., Valasek, I.: „Tribológia 2. Kenőanyagok és vizsgálataik”, 2003, Tribotechnik Kft., Budapest, (ISBN 963 00 8689 1), 152 oldal  
Varga Zoltán, Marton Zsuzsanna, Deák Gyula: Kőolajipari számítások, 2005, (Tanszéki kiadvány)  
Speight, J.G.: The chemistry and technology of petroleum. Marcell Dekker, 1991. Gary, J.H.: Petroleum refining technology and



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### Required and recommended readings:

economics. Marcell Dekker, 1984. Chauvel,A, Lefebre,G.: Petrochemical processes I-II. Gulf. 1989. Edmister,W.C., Lee,B.I.: Applied hydrocarbon thermodynamics, Gulf, 1985 API Technical Data Book – Petroleum Refining, 1997 PRO/II Input Manual, Pro/II Reference Manual, 2006 Reid,R.C., Prausnitz,J.M.,Poling,B.E.: The Properties of gases and liquids, McGraw-Hill, 1987