

Syllabus:

Petroleum and source rock geochemistry 206-26101

Instructor: Shimon Feinstein shimon@bgu.ac.il; Tel. 08-6472622

Office: Room 120, Building #58, Tuesday 11:30-12:30

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Office: Room 020, Building #58, Sunday 12:00-13:00

2h class (incl. few integrated exercises), 2 credit points

Main subjects:

Fossil fuels; Oil and gas: definitions; overview of origin and processes (organic/inorganic); oil and gas systems (conventional and unconventional).

Source rocks for oil and gas: definition; accumulation and composition of organic matter in sedimentary rocks; the transfer of organic matter from biosphere to geosphere; kerogen, bitumen, geochemical fossils.

Coal: petrology, composition, coalification rank, Van Krevelen diagram.

Oil and gas generation: thermal maturation, methods for evaluation, liquid and gas windows, geothermal history; biogenic gas generation.

Source rock evaluation: parameters controlling type and quantity of hydrocarbons in a reservoir. kerogen richness-type-chemical composition-convertibility potential; geothermal history and thermal maturation; expulsion efficiency, geo-chromatography and reservoir dynamics; analytical and evaluation methods, estimation of total generation potential and actually generated oil and gas .

Oil, gas and source rock bulk, molecular and C, H, N, S stable isotopes characterization; biomarkers; oil-oil and oil-source rock correlations; primary vs. post-generation characteristics; genetic groups classification; oil and gas systems.

Genetic groups and oil and gas systems in Israel

References:

- Durand, D., (Ed.), 1980. *Kerogen*, Éditions Technip, 519p.
- Hunt, J.M., 1979. *Petroleum geochemistry and Geology*, W.H. Freeman and Co., 617p.
- Magoon, L. B. and Dow, W. G. (Eds.), 1994. *The Petroleum System - from source to trap*. AAPG Memoir 60, pp. 3-24
- Peters, K.E., Walters, C.C., Moldowan, J.M., 2004. *The biomarkers guide*. Cambridge University Press (2nd Ed). Volumes 1 & 2.
- Tissot, B.P. and Welte, D.H., 1984, *Petroleum Formation and Occurrence* (2nd edition): Springer-Verlag, Germany, 699 p.

* Additional references will be assigned on-line per studied subjects.

Grading: Exercise assignments - 10%

Final examination – 90%