

PETROLEUM-GAS UNIVERSITY OF
PLOIEȘTI
DOCTORAL SCHOOL

Doctoral field CHEMICAL ENGINEERING

Approved at the CSD meeting in

Director of Doctoral School
Prof. habil. PhD.Eng. Mihai Albuлесcu

SYLLABUS ALTERNATIVE FUEL MANUFACTURING PROCESSES

Discipline category: **Advanced knowledge**

Number of hours for study: **210**

Number of credits allocated: **15**

Evaluation form: **Exam**

CONTENT

- 1. Progress and trends in the development of economical, non-polluting engines powered by alternative / unconventional fuels**
- 2. Current legislation on the protection of air pollution due to cars transport**
- 3. Alternative fuels: natural gas and GTL (Gas to Liquid), hydrogen, oxygenated organic compounds (ethers), biofuels, bioethanol, vegetable oils, esters of vegetable and animal oils**
- 4. Alternative fuel manufacturing technologies for obtaining LPG, CNG, GTL; obtaining of the hydrogen; Technologies for the manufacture of oxygenated organic compounds of the ethers type; Biofuel manufacturing technologies (biogas, bioethanol, biodiesel)**
- 5. Alternative fuel storage and supply systems**
- 6. Pollutant emissions from cars fueled by alternative fuels**
- 7. Economic considerations regarding the manufacture and use of alternative fuels**

REFERENCES

1. KNOTHE, G., GERPEN, J. V., KRAHL, J., *The biodiesel handbook*, AOCS Press, 2005.
2. SPEIGHT, J. G., *The refinery of the future*, Elsevier Science, Norwich, N.Y., Oxford, 2011.
3. SINGH, A., RATHORE, D., *Biohydrogen production: sustainability of current technology and future perspective*, Springer (India), 2017.
4. TWIDELL, J., WEIR, T., *Renewable energy resources*, 2nd Edition, Taylor & Francis, 2007.

5. HUBCA, GH., LUPU, A., COCIAȘU, C.A., *Biocombustibili, Biodiesel Bioetanol Sun diesel*, Editura Matrix Rom, Bucuresti, 2008.
6. ***Directiva 2009/30/CE a Parlamentului European si a Consiliului din 23 aprilie, 2009.
7. ONUȚU, I., JUGĂNARU, T., *Merceologia produselor petroliere*, Editura UPG Ploiești, 2018.
8. LEE. S., SPEIGHT, J.G., LOYALKA, S.K., *Handbook of alternative fuel technologies*, CRC Press, 2007.

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Responsible for the doctoral field

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