

COURSE ID SHEET



Course No.	5157	NTUA			
Semester:	8,10	Core		Elective	Specialization X

Title:	LIQUID FUELS
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Aim:	The course “Liquid Fuels” provides the necessary knowledge for liquid fuels and lubricants. The aim of the course is to give the students the basic knowledge on the characteristics of liquid fuels, biofuels, and the production and utilization of lubricants. The students will participate in laboratory assignments dealing with tests on liquid fuels and lubricants according to standard test methods.
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Content:	Transport Fuels. Gasoline: knock characteristics, octane number, volatility, composition. Gasoline blending, non-linear blending properties. Automotive diesel: ignition delay, cetane number, cold flow properties, lubricity. Non-linear blending properties. Biofuels. Bioethanol: characterization, properties. Properties of bioethanol – gasoline blends. Biodiesel: characterization, properties. Microbial contamination, oxidation stability. Hydrotreated vegetable oils (HVO). Production, properties. Aviation Fuels. Aviation gasoline: properties, knock characteristics, volatility. Aviation turbine fuels (kerosene): volatility, conductivity, freezing point. Residual Fuels – Marine Fuels. Viscosity, blending calculations, stability – compatibility. Ignition quality, combustion characteristics, heteroatoms, contamination. Low sulfur residual fuels, Lubricants: Properties of lubricants. Lubricants classification. Viscosity, viscosity index. Additives. Used lubricants recycle and regeneration. Lubricating greases: production, properties, thickeners. Penetration, drop point. Bio-lubricants. Laboratory Assignments: • Density, Distillation and Cetane Index of Middle Distillates. • Derived Cetane Number of Diesel Fuels. • Vapor Pressure of Motor Gasoline. • Cold Flow Properties of Middle Distillates. • Flash Point of Middle Distillates. • Sulfur Content of Petroleum Products. • Spot Test and Markers in Petroleum Products. • Viscosity and Viscosity Index of Lubricants. • Penetration and Drop Point of Lubricating Greases.
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Hours per semester:	LECTURES	24	EXERCISES	-	LABORATORY	16	HOME-WORK	135	TOTAL HOURS: 175
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Student performance/evaluation:	The evaluation is based on: • A Final (written) Examination (FE). In the final exam, students compete on topics covered by theory, and computational exercises. Students can use their personal notes and textbook during the exam, and • Laboratory Exercises and Reports (LE). The Final Grade results as follows: Final Grade = 0.7 x (FE) +0.3 x (LE)
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