Program and Degree: **BSc in Aerospace Engineering**	
Course Description	
Course Title	**Combustion and Fuels**
Prerequisites	Thermodynamics 2
The course aims	Students' acquaintance with the principles of Chemical Combustions, fuels, and propellants, which are used in aerospace engines.
Contents	1. An introduction to fuels and propellants: solid, liquid and gas propellants. 2. Liquid fuels: Refining operations, chemical formula, Properties and specifications of petroleum fuels, includes thermal value, viscosity, flash point, flood point, Sulfur content, vapor pressure. 3. Liquid fuels: Natural gas, Petroleum gas, Refinery gas, Coal gas, Industrial gas, Specifications of gas fuels, different uses of gas fuels, transmission system to consumption areas. 4. Solid fuels: Coal, Coal analysis, Coal preparation for combustion, various uses of coal, other solid fuels 5. Stoichiometric combustion analysis: a brief description of the basic rules of gases and thermodynamics, combustion of fuel elements with oxygen, combustion with air, incomplete combustion, combustion product analysis, dew point of combustion products 6. Thermochemical analysis of Combustion: The specific heat of combustion products and their changes with temperature, calculation and measurement of the thermal value of combustion products, the adiabatic flame temperature, the chemical balance of combustion processes, tables and combustion diagrams 7. Combustion transformation mechanism: A brief description of the practical problems of combustion, chemical kinetics theory, chain reaction theory, flame propagation 8. Burners: Gas burners, liquid burners, pressure burners, centrifugal burners, evaporative burners, combustion in internal combustion engines, combustion in furnaces 9. A brief to nuclear fuels 10. Combustion in jet engines and rockets, liquid and solid fuels in aerospace, aircraft fuels.
Duration	**1 Semester (16 weeks)**
Course Hours	**3 hours/week**
Course Type	**Required**