MA 533- Combustion Engines I

Course Code:	MA-533
UTAA Credit (Theoretical-Laboratory hours/week):	3(3-0)
ECTS Credit:	6.0
Department:	Mechanical and Aeronautical Engineering
Language of Instruction:	English
Level of Study:	Graduate
Offered Semester:	Fall and Spring Semesters.

Course Objectives

To review and confirm the basic principles of combustion thermodynamics.

Combustion temperature and heat of reaction

Chemical Equilibrium and determination of reaction products

Reaction kinetics

To teach the elementary theory of premixed flames

To teach the basic elements of diffusion flames

To teach the basics of heterogeneous combustion

C**ourse Content**

Chemical thermodynamics, chemical reactions, chemical equilibrium, combustion physics, kinetically controlled and diffusion controlled combustion, diffusion flames, premixed flames, laminar flame speed, detonation and deflagration, combustion of solids

Course Learning Outcomes

1-Compute adiabatic flame temperatures of multi-component gas mixtures with dissociation of the products.

2-Predict flame speeds

3-Given the initial mixture properties, estimate the speed and pressure of a detonation wave

4-Know the main differences between laminar and turbulent combustion

5-Know the main differences between premixed and diffusion flames

6-Designing combustion systems