

INTRODUCTION TO COMBUSTION PROCESSES (2 2 7 7 1)

Syllabus

Course staff: Dr. Victor Chernov. e-mail: chernov@braude.ac.il. Office: D1-397. Office phone: 04-9901709. Office hours will be published at class.

Credits: 2.5.

Weekly hours: Lecture 2 hours, tutorial 1 hour.

Textbooks:

- Shapiro, M. J., Fundamentals of Engineering Thermodynamics, John Wiley & Sons.
- Turns, R. T., An Introduction to Combustion, Concepts and Applications, McGraw-Hill

Course goal and description: Combustion is the oldest and most widespread process to produce energy. Combustion combines chemistry and fluid mechanics processes. The course consists of two parts. In the first part the students learn about the chemistry and thermodynamics of idealized combustion processes. In the second part an overview of practical systems will be given.

Main course subjects:

1. Thermodynamics of reacting systems
2. Chemical kinetics and mechanisms
3. Premixed flames
4. Diffusion flames
5. Fuel types
6. Droplet combustion
7. Solids combustion
8. Pollutants
9. Combustion chambers of gas turbines
10. Combustion chambers of internal combustion engines
11. Combustion chambers of rocket motors

Grade: 20% homeworks, 20% paper summary, 60% final paper