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Application of Atmospheric Pressure Plasma - Course Syllabus

Course Number: ME261

Course Title: Application of Atmospheric Pressure Plasma

Academic Semester:	Spring	**Academic Year:**	2015/ 2016
Semester Start Date:	Jan 24, 2016	**Semester End Date:**	May 19, 2016

Class Schedule: Sun. & Tue. 10:30-12:00

Classroom Number:

Instructor(s) Name(s): Min Suk Cha
Email: min.cha@kaust.edu.sa

Office Location: B5. R4218
Office Hours: Sun. 14:00-15:00
Teaching Assistant name:
Email:

COURSE DESCRIPTION FROM PROGRAM GUIDE

Introduction to plasma sources in atmospheric pressure condition: dielectric barrier discharge, pulsed corona, arc, elongated arc, and microwave plasma. Application fields for mechanical engineers. Energy: fuel reforming and combustion. Environment: after-treatment of hazardous gases. Manufacturing: surface treatment of materials. Plasma devices for bio-medical application.

COMPREHENSIVE COURSE DESCRIPTION

Introduction to fundamental discharge physics and related plasma chemistry. Basic principles of various plasma sources in atmospheric pressure condition will be covered including dielectric barrier discharge, pulsed corona, arc, elongated arc, and microwave plasma. Up-to-dated application fields of APP(Atmospheric Pressure Plasma) for mechanical engineers will be introduced.

- Energy: fuel reforming and combustion.

- Environment: after-treatment of hazardous gases.

- Manufacturing: surface treatment of materials.

- Plasma devices for bio-medical application.

GOALS AND OBJECTIVES

- Conceptual understanding of physics and chemistry in plasma.

- Capability to choose suitable plasma sources in research and applications.

- Understanding a role of APP in various fields including energy, environmental, material, and biomedical applications.

REQUIRED KNOWLEDGE

General Physics and Chemistry

REFERENCE TEXTS

A. Fridman, Plasma Chemistry, Cambridge (2008)

A. Fridman, L. Kennedy, Plasma Physics and Engineering, Taylor & Francis (2004)

METHOD OF EVALUATION

Percentages %	Graded content
20% **30%** **50%**	**Assignments** **Mini-projects** **Exams**

COURSE REQUIREMENTS

Assignments

Written assignments
Experimental mini-projects

Course Policies

Absence without prior notice will not be accepted.
Late submission of assignments will not be accepted.

NOTE
The instructor reserves the right to make changes to this syllabus as necessary.