UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Plasma Physics Laboratory II

2122-1-F1701Q132

Aims

The focus is on the plasma applications.

The course aims to the learning of general ideas and experimental tecniques for the characterization of electrical discharges in gas mixtures and their use in material processing.

Contents

Plasmas produced in electrical discharges in gases.

Low pressure cold plasmas.

Radiofrequency plasmas.

Cold plasmas at atmospheric pressure.

Plasma diagnostics.

Plasma processing for material treatments.

Atomic Force Microscopy.

Detailed program

The laboratory starts with an introduction on electrical discharges in gases,

on elementary processes in plasmas and on plasma processing of materials.

Experiments will be realized in small groups concerning, partially at student will, according to the available instrumentations and the number of students:

a) Characterization of a glow discharge

b) Characterization of a plasma produced by a radiofrequency antenna

c) Characterization of a DBD, Dielectric Barrier Discharge

d) Characterization of plasma-material interactions also with atomic force microscopy.

Prerequisites

It is required to have attended to the Plasma Physics Laboratory I.

It is useful but not needed to have attended to general courses of Plasma Physics.

Maths and physics concepts given in the first-level degree.

Teaching form

Activities will be held in laboratory.

Laboratory: 72 hours (6 cfu)

Textbook and teaching resource

References:

Y.P.Raizer, Gas Discharge Physics, Springer-Verlag, 1991.

website: http://virgilio.mib.infn.it/labdida/doku.php?id=laboratorio_di_plasmi

Semester

First year, second semester

Assessment method

Oral (after the presentation of a written report of the experiments performed).

Questions concern the experiements preparation and the results of the measurements.

Evaluation focuses on expression precision, the awareness of the subject and the capability

to connect experimental results with basic plasma properties.

Mark range:

18-30/30

Office hours

During semester:

Friday, from 10.30 to 11.30, at the teacher office (U2-3029, III floor)

During the year:

Book a meeting by email (ruggero.barni@unimib.it), at the teacher office (U2-3029, III floor)