

Syllabus and Reading Assignments (Version 01)

Reading assignments in Lieberman are required. Others are recommendations for background.

Unit	Topic	Reading Assignments (Chapters or sections)	
		Lieberman	Fridman
I.	Introduction	1	1
II.	Electron Collisions	3,8 Appendix A	2,3
III.	Cross Sections and Rate Coefficients	3,8	2,3
IV.	Gas Discharges	2	7
V.	Electron Continuity Equation, Diffusion, Production, Loss	2,5	4.5
VI.	Sheaths	6.1-6.5 Handouts	6.1
VII.	Electron Distribution Functions	2, Appendix B	4.1-4.2
VIII.	Transport Coefficients	5	6
IX.	Low Pressure DC Discharges	10,14	7.12-7.8
X.	High Pressure Discharges and Electron Beam Pumped Plasmas	Handouts	12
XI.	RF and Microwave Discharges	11,12	10.5-10.6, 10.9
XII.	Fully Ionized Plasmas	4, Handouts	
XIII.	Magnetic Fields in Discharges	4	6.2
XIV.	Inductively Coupled Plasmas	12	10.7
XV.	Diagnostics	6.6	
XVI.	Applications and Special Topics (to be selected by class)		
	a. Plasma Etching/Deposition/Surface Chemistry	7, 9, 15, 16	
	b. ECR and Helicon	13.1,13.2	10.8
	c. Plasmas in Liquids	Handouts	
	d. Plasma Medicine	Handouts	
	e. Dielectric Barrier Discharges	Handouts	

Required: M. Lieberman, Principles of Plasma Discharges and Material Processing, 2nd Edition (Wiley, New Jersey, 2005)

Optional Text: A. Friedman and L. A. Kennedy, Plasma Physics and Engineering (Taylor and Francis, New York, 2004)

Class Schedule (Version 02)

The class schedule is listed below. Due to my travel commitments this Fall, we have scheduled alternate makeup lectures on Friday afternoons. The times and locations of the alternate classes are:

Alternate Classes:

	<u>Date</u>	<u>Time</u>	<u>Room</u>
17	Sept.	4:00 – 5:30 pm	DOW 1018
24	Sept.	4:00 – 5:30 pm	DOW 1018
1	Oct.	4:00 – 5:30 pm	DOW 1018
15	Oct.	4:00 – 5:30 pm	EECS 1012
29	Oct.	4:00 – 5:30 pm	EECS 1012
5	Nov.	4:00 – 5:30 pm	EECS 1012

Class Schedule:

<u>Class</u>	<u>Day</u>	<u>Date</u>		<u>Comment</u>	<u>Approximate (!) Topic (See Syllabus for Reading Assignment)</u>
1	T	7	Sept.		Introduction
2	Th	9	Sept.		Electron Collisions
3	T	14	Sept.		Electron Collisions
4	Th	16	Sept.		Cross Sections and Rate Coefficients
5	F	17	Sept.	Alternate Class	Cross Sections and Rate Coefficients
	T	21	Sept.	MJK Travel	
	Th	23	Sept.	MJK Travel	
6	F	24	Sept.	Alternate Class	Gas Discharges
7	T	28	Sept.		Electron Continuity, Diffusion, Sources
	Th	30	Sept.	MJK Travel	
8	F	1	Oct.	Alternate Class	Electron Continuity, Diffusion, Sources
	T	5	Oct.	MJK Travel	
	Th	7	Oct.	MJK Travel	
9	T	12	Oct.		Electron Continuity, Diffusion, Sources
10	Th	14	Oct.		Sheaths
11	F	15	Oct.	Alternate Class	Electron Energy Distributions
	T	19	Oct.	Fall Study Break	
	Th	21	Oct.	MJK Travel	
12	T	26	Oct.		Electron Energy Distributions
13	Th	28	Oct.		Transport Coefficients
14	F	29	Oct.	Alternate Class	Low Pressure DC Discharges
15	T	2	Nov.		Low Pressure DC Discharges
16	Th	4	Nov.		High Pressure and e-beam pumped plasmas
17	F	5	Nov.	Alternate Class	High Pressure and e-beam pumped plasmas
18	T	9	Nov.		RF Discharges
19	Th	11	Nov.		RF Discharges

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20	T	16	Nov.		Fully Ionized Plasmas
21	Th	18	Nov.		Magnetic Fields in Discharges
22	T	23	Nov.		Magnetic Fields in Discharges
	Th	25	Nov.	Thanksgiving Recess	
23	T	30	Nov.		Inductively Coupled Plasmas
24	Th	2	Dec.		Diagnostics
25	T	7	Dec.		Special Topics – or Project Presentations
26	Th	9	Dec.		Special Topics – or Project Presentations
	M	13	Dec.	Final Project Due (5:00 pm)	