MT 240 RF Plasma Systems - Syllabus Winter 2022

This is a web based syllabus and is best viewed/utilized on-line

Instructor:	Eric Kirchner		
Office:	RC 7-202 Portland Community College 17705 NW Springville Road Portland, OR 97229	Administrative Assistant	Caitlin Recor Rock Creek 2-230 971-722-7331 Caitlin.Recor@pcc.edu
Phone:	971-722-7621	CRN 10214	Mon 11 AM – 1:50 PM RC 7-231
E-mail	ekirchne@pcc.edu		Tues 12 AM – 1:50 PM Remote
Web:	my.pcc.edu (Desire2Learn)	CRN 12869	Thurs 8 AM – 10:50 AM RC 7-231
Office Hours:	See PCC staff web directory.		Fri 9 AM – 10:50 AM Remote

Course Description: RF Plasma Systems Covers the theory and practice of RF (Radio Frequency) plasma systems as used in semiconductor manufacturing processes such as etching, chemical vapor deposition (CVD) and sputter deposition. Includes plasma physics, RF power system components, power matching and match circuits, and applications in semiconductor manufacturing

Credits: 3
Prerequisites: MT 112 (Electronic Circuits II), MT 223 (Vacuum Technology), CH 100 or higher (General Chemistry), WR 227 (Technical Writing), or instructor permission.

Textbook: There is no required textbook for this course. Resource materials will be provided through the Internet and in handouts and lectures.

Instructional Program: This course will be delivered in a lecture/lab/recitation format. The content of the course is delivered via text readings and internet based presentations. A three hour lab demonstrates the critical concepts from the course content. A 2 hour recitation will give the opportunity for discussion of the course material, homework and lab results. Weekly quizzes will be given on the previous week's material, and there will be a midterm and a final exam. Outside reading will be assigned and should be completed prior to next class session.

Laboratory exercises will we assigned and experimental procedures, data, and conclusions will be documented in laboratory reports. Lab data should be kept in a proper lab notebook. Each module will require a partial or full lab report. Some components will require group work and some individual reporting.

Course Objectives:

- Anticipate how electrical devices function at RF frequencies when analyzing equipment operation
- Use concepts of Load Matching and effects of Transmission Line Length to operate and perform basic troubleshooting of RF power supplies and load match networks
- Discuss with a work group how plasma is generated and used in manufacturing processes, and analyze how the plasma controls affect the process
- Write effective technical reports on process and equipment tests, diagnoses and maintenance tasks
- Identify the hazards associated with a plasma system to avoid injury or death when working on or near such equipment.

Grading:

Quizzes/Homework/Participation	20%	88 – 100% of total points	A
Midterm Exam	15%	75 – 88% of total points	B
Final Exam	25%	65 – 75% of total points	C
Laboratory grade	40%	55 – 65% of total points	D
		< 55% of total points	F

Course Schedule (approximate):

Week	Lecture Topic
1	Review of Electric Circuits
2	Review of Electric Circuits
3	Introduction to Plasma Physics
4	Introduction to Plasma Physics
5	Midterm exam
6	Transmission Lines
7	Transmission Lines/RF Power Delivery
8	RF Power Delivery
9	Application: Sputtering
10	Application: Sputtering
11	Final exam

No class on Monday, January 17

Important:

- I will use your PCC email if I need to reach you – please check it regularly.
- Attendance: counts as participation. Please see me regarding any class you must miss.
- Tests and quizzes are closed book, one hand written crib sheet (8.5"x11") allowed
- Exams, labs and homework can only be made up by prearrangement. Work submitted late will be penalized.
- Assignment/exam calendars may be changed in response to the weather or institutional problems.
- If you have an accommodation form from Disability Services (DAS) [www.pcc.edu/resources/disability], please make arrangements to meet with me privately at the beginning of the term to discuss your needs.
- Grades are assigned based on the PCC grading policy [http://www.pcc.edu/resources/academic/standardspractices/AcademicStandardsandPractices-GradingGuidelines.html]. Students should be aware of the grading options and the associated deadlines.
- Academic Integrity: Submitting improperly cited work copied from other sources is a violation of PCC's Code of Student Conduct [http://www.pcc.edu/about/policy/student-rights/documents/student-conduct.pdf] and Academic Integrity policy[http://www.pcc.edu/about/policy/student-rights/documents/academic-integrity.pdf]. All work submitted (homework, presentations) should be the student's original work. Any assignment in violation will receive a zero.
- Here are some other items you should know as a PCC student: http://catalog.pcc.edu/handbook/s704-syllabus-standardsforcreditcourses/