

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

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E-mail	ekirchne@pcc.edu	CRN 10162	Mon 11 AM – 1:50 PM RC 7-231 Tues 12 PM – 1:50 PM RC 7-231
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Office Hours:	See PCC staff web directory.	CRN 12008	Thurs 9 AM – 11:50 AM RC 7-231 Fri 9 AM – 10:50 AM RC 7-231

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 or MT 112A (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 practices 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. Homework and reports are the bulk of the assessment in this course, and are required. 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	10%	88 – 100% of total points	A
Homework	10%	75 – 88% of total points	B
Midterm Exam	15%	65 – 75% of total points	C
Final Exam	25%	55 – 65% of total points	D
Laboratory Reports/Activity	40%	< 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: Deposition, Etch, Etc.
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 lab activity. Please see me regarding any class you must miss.
- Homework and Reports are required; 80% must be submitted prior to being allowed to take the exams.
- 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>]. You should be aware of your 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, reports) should be the your original work. Any assignment in violation will receive a zero. This includes the use of internet tools and artificial intelligence; using those without citation is a violation. In general, I discourage their use as they short circuit your learning intended with the given assignments.
- Here are some other items you should know as a PCC student: <http://catalog.pcc.edu/handbook/s704-syllabus-standardsforcreditcourses/>