

ECE 795/895 Fundamentals of Solar Cells

Spring 2013

Class time: Lecture: MW 3:00-4:15, KH100

Instructor: Dr. Sylvain MARSILLAC
Office: Kaufman Hall, Room 231L
Email: smarsill@odu.edu
Use an email subject line: ECE795 + a descriptive subject
Office hours: MW 2:00-3:00 or by appointment

Textbook:

- We will be using a NSF website for most of the class
<http://pveducation.org/pvcdrom>

Additional material may be drawn from the following texts (*but you do not need to buy them*):

1. “Solar Cells: Operating Principles, Technology and System Applications”
By Martin A. Green (Prentice-Hall, Englewood Cliffs, N.J., 1982)
ISBN: 0-85823-580-3
2. “Handbook of Photovoltaics”, 2nd Ed. By S. Hegedus and A. Luque
3. “Principles of Electronic Materials and Devices”, 3rd Ed. By O. Kasap
4. “Introduction to Solid State Physics”, 8th Ed., By C. Kittel
5. “Semiconductor Devices, Physics and Technology”, 3rd Ed., By S.M. Sze

Course learning objectives

This is a 3-credit lecture course providing an overview of the fundamental of solar cell technologies, designs, and operation. The course is designed for graduate students in Engineering, Physics and Chemistry disciplines interested in the field of alternative energy. The course objectives are to make sure each student:

- understands the various forms of alternative energy
- understands solar cell designs
- understands solar cell operation
- acquires knowledge of the various solar cells technologies

The topics to be covered include:

- Alternative energies
- Properties of Sunlight
- PN Junction
- Solar Cell Operation
- Design of Crystalline Silicon Cells
- Other solar cell technologies: a-Si:H, CdTe, Cu(In,Ga)Se₂, GaAs, organic
- Characterization
- Photovoltaic systems

COURSE POLICIES AND CLASSROOM CONDUCT

1. The instructor reserves the right to make changes to the class schedule and the course outline. All such changes will be announced in class. It is *your* responsibility to be made aware of such changes by either checking with the instructor or classmates. If you are absent from class, you are responsible for the material covered during your absence and any assignments due during your absence.
2. You are encouraged to reference the detailed expectations for ODU classroom conduct at <http://studentaffairs.odu.edu/oscai/>.
3. You are expected to turn off personal communication, sound or video devices when in class. Laptop use is restricted specifically to relevant course work. Abuse will result in the removal of this privilege.
4. Late work will not be accepted. You are encouraged to turn in your work early if you must miss class. Graded work may be submitted in hard copy. Soft copy submissions will only be accepted through Blackboard unless advance arrangements have been made with the instructor.
5. ODU's class withdrawal policy can be found at <http://www.odu.edu/ao/registrar/grades/incompletes/withdraws.shtml>

SPECIAL ACCOMMODATIONS

If you require special accommodations, contact me at the earliest possible time so that alternate arrangements can be made for taking exams and completing assignments. The Office of Educational Accessibility is located in 1525 Webb Center and can be contacted at (757) 683-4655. Information can also be found at <http://studentaffairs.odu.edu/educationalaccessibility/>

ACADEMIC INTEGRITY

Academic dishonesty of any kind will not be tolerated. You are expected to adhere to all aspects of the ODU Honor System. The Honor Code, Honor Pledge, and the Monarch Creed can be found at <http://studentaffairs.odu.edu/oscai/>. Appeal procedures can be found at <http://www.odu.edu/ao/bov/manual/pdfs/1530.pdf>

GRADING and EXAMS

Exam content

Only material covered in class or in the homework will be used for the exams.

There will be three types of exam:

1. **Quiz**

The Quizzes will be short, with multiple choices (MCQ) or problems. They are given to make sure that you have understood the basic concepts taught during the last 3-4 classes. The Quizzes will be closed-book, closed-notes.

2. **Final exam**

The Final exam will be a combination of MCQ and problems. The Final exam will be open-book, open-notes.

3. **Project**

A project will be assigned to each student. It will result in a final report and a presentation.

Grading distribution

Grades will be determined according to:

Project: 35%

Quizzes: 35%

Final exam: 30%

Grading scale

A	90 - 100	C	66 – 69.9
A-	86 – 89.9	C-	62 – 65.9
B+	82 – 85.9	D+	58 – 61.9
B	78 - 81.9	D	54 – 57.9
B-	74 – 77.9	D-	50 – 53.9
C+	70 – 73.9	F	< 50

The instructor reserves the right to make changes to the grading scale.