



Philadelphia University

Faculty of Engineering - Department of renewable energy
Engineering
Second Semester 2016/2017

Course Details:

- Title:** Solar energy lab (650345)
- Prerequisite:** Photovoltaics system 0611422)
- Credit Hours:** 1 credit hours (16 weeks per semester, approximately 32 contact hours)
- Textbook:** Laboratory notes and manual
- References:** 1. Photovoltaic Systems 2nd Edition ,2009 ,by James P. Dunlop. ISBN-13: 978-0826913081, ISBN-10: 0826913083
- Course**
- Understand the concept of solar radiation.
 - Understand the operation of solar cell.
- Description:** Understand the operation of solar cell connection
- Website:** <http://www.philadelphia.edu.jo/academics/wagahfm/> Dr Wagah Al-Azzawi
- Instructor:** **Email:** wagah2000@yahoo.co.uk
Office: Engineering building, room 728, ext: 2432
Office hours: Sun, Tues, Thurs, Mon, Wed: 11:15-1:15

Course Outlines:

| Week | Topic |
|------|---|
| 1 | <i>Sun radiation measurements</i> |
| 2 | <i>Properties of photovoltaic devices</i> |
| 3 | <i>open circuit voltage and short circuit current</i> |
| 4 | <i>maximum power point (MPP)</i> |
| 5 | <i>The efficiency of solar cells</i> |
| 6 | <i>parallel and series solar cells</i> |
| 7 | <i>shadow, temperature and dust effect</i> |
| 8 | <i>battery charging and control</i> |
| 9 | <i>off grid connection.</i> |
| 10 | <i>on grid connection.</i> |

Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

| | | |
|----|---|------|
| 1. | To be familiar with sun radiation | [a] |
| 2. | To be able to connect solar cells series and parallel | [b,] |
| 3. | To test the functionality of solar cell | [k] |

Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

- Quizzes:** (3-5) quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.
- Reports:** 10 report.
- Final Exam:** The students will undergo a scheduled final exam at the end of the semester covering the whole materials taught in the course.

Grading policy:

| | |
|-------------|--|
| First Exam | "Quizzes (5%), reports (10%) and performances (5%)" 20% |
| Second Exam | "Quizzes (5%), reports (10%) and performances (5%)" 20% |
| Third Exam | "Quizzes (5%), reports (10%) and performances (5%)" 20% |
| Final Exam | "Practical 30% and Theoretical 10% " 40% |
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| Total: 100% | |

Attendance Regulation:

The semester has in total 45 credit hours. Total absence hours from classes must not exceed 15% of the total credit hours. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course. If the excuse is approved by the deanship the student will be considered withdrawn from the course.

February, 2017