نموذج (هـ)

Summarized Course Description

Course number: ECE 451	Course name: Solar cells
لغة تدريس المقرر: English	Pre-requisites: ECE 350
Credit hours: 4 (**3-2-0**)	Course level: Level – **8 or 9**

Course Description وصف المقرر :

Advanced semiconductor devices as a new source of energy for the 21st century. Delivering electricity directly from sunlight. The suitable semiconductor materials. Device physics. Fabrication technologies for solar cells. The cost aspects, market development. Application areas of solar cells. Application of design of a complete solar cell system for household application.

Course objectives أهداف المقرر :

1. Learn about the principles of the photovoltaic conversion.
2. Explain the advantages and limitations of different solar cell technologies, such as crystalline silicon solar cell technology and thin film solar cell technologies.
3. Present an understanding of the specifications of solar modules and know how to design a complete solar system for a particular application.

Course Outcomes مخرجات التعليم:

On successful completion this course, the student should be able to:

1. Explain the principles that underlie the ability of various natural phenomena to deliver solar energy

2. Outline the technologies that are used to harness the power of solar energy

3. Discuss the positive and negative aspects of solar energy in relation to natural and human aspects of the environment.

4. Acquainted with solar cell foundimentals: why we need solar energy, how solar cells produce power, and how they work.

5. Be familiar mono- and multi-crystalline solar cells, thin film solar cells, and new emerging technologies.

Textbook and references الكتاب المقرر والمراجع المساندة:

Text Book: Wenham, S. R., M. A. Green, M. E. Watt, R. Corkish. Applied Photovoltaics. 2nd .ed. New York, NY: Earthscan Publications Ltd., 2007. ISBN: 9781844074013.

References:

Poortmans, J., and V. Arkhipov. Thin Film Solar Cells: Fabrication, Characterization and Applications. Hoboken, NJ: John Wiley & Sons, 2006. ISBN: 9780470091265.
Green, M. A. Third Generation Photovoltaics: Advanced Solar Energy Conversion. New York, NY: Springer-Verlag, 2007. ISBN: 9783540265627.
Ruud E. I. Schropp, Miro Zeman, Amorphous and microcrystalline silicon solar cells: modeling, materials, and device technology, Volume 5 of Electronic Materials Series, Publisher: Springer, 1998, ISBN 9780792383178
Online book: Honsberg, C., and S. Bowden. Photovoltaics: Devices, Systems and Applications