Summarized Course Description

Course number: ECE 350	Course name: Optical Electronics
لغة تدريس المقرر : English	Pre-requisites: ECE 240,ECE 241
Credit hours: 4 **(3-2-0)**	Course level: Level - 7

Course Description   وصف المقرر :

Fundamentals of optical signals and modern optical devices and systems. Photovoltaic solar cells. Optical systems sources (e.g., lasers and light-emitting diodes), light modulation components (e.g., liquid-crystal light modulators), transmission media (e.g., free space or fibers), photodetectors (e.g., photodiodes, photomultiplier tubes), information storage devices (e.g., optical disk), processing systems (e.g., imaging and spatial filtering systems) and displays (LCOS microdisplays).

Course objectives   أهداف المقرر :

1. Introduce the student to the generation, propagation, and detection of optical electromagnetic waves.
2. Gain a fundamental understanding of the basic physics and technology of quantum electronics devices and laser systems.

Course Outcomes   مخرجات التعليم:

Upon completing the course, the student should be able to:

1. Predict optical output intensity and efficiency of a continuous wave laser.
2. Explain the differences and similarities between lasers based on transitions between discrete atomic or molecular levels, and semiconductor lasers. 27.
3. Explain the principles of gain and absorption in highly doped homojunction laser diodes operating with high-levels of injection current.
4. Use the concepts of densities of states, quasi-Fermi levels, Fermi distributions and simple semiconductor energy band theory to compute gain vs frequency as a function of injection current in a homojunction laser.
5. Design a simple diode laser having given performance specifications.

Textbook and references   الكتاب المقرر والمراجع المساندة:

Text Book: J. T. VERDEYEN, LASER ELECTRONICS, 3RD ED., PRENTICE-HALL.

REFERENCES

Saleh, B., and M. Teich. *Fundamentals of Photonics*. New York, NY: Wiley, 1991. ISBN: 0471839655.

R. Feynman, Lectures on Computation. Editors A.J.G. Hey and R.W. Allen, Addison-Wesley 1996