



Jordan University of Science and Technology
Faculty of Science & Arts
Physics Department

PHY772 Physics Of Semiconductor

First Semester 2021-2022

Course Catalog

3 Credit Hours. To give knowledge about semiconductor physics and discuss working and applications of basic devices, including p-n junctions and solar cells.

Text Book

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|--------------------------|-----------------------------------|
| Title | Semiconductor Physics and Devices |
| Author(s) | D. A. Neamen |
| Edition | 4th Edition |
| Short Name | 1 |
| Other Information | |

Course References

| Short name | Book name | Author(s) | Edition | Other Information |
|------------|--|---------------------------------|--------------|-------------------|
| 2 | Principles of Semiconductor Devices Web edition ? http://ece-www.colorado.edu/~bart/book/ | B. Van Zeghbroeck, | 3rd Edition | |
| 3 | Physics of Semiconductor Devices | S M Sze | 2nd Edition | |
| 4 | Photovoltaics Education Website, www.pveducation.org , 2019 | C.B.Honsberg and S.G.Bowden, | 19th Edition | |

Instructor

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|-----------------|---------------------|
| Name | Dr. Adnan Shariah |
| Office Location | PH3 L1 |
| Office Hours | |
| Email | shariah@just.edu.jo |

| Class Schedule & Room |
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| Section 2: Lecture Time: Sun, Tue : 14:30 - 16:00 Room: U |

| Tentative List of Topics Covered | | |
|---|--|------------------------------|
| Weeks | Topic | References |
| Week 1 | 1.1 Semiconductor Materials | From 1, From 2 |
| Week 1 | Principles of Quantum Mechanics | From 1 |
| Week 2 | Introduction to the Quantum Theory of solids | From 1 |
| Week 3 | Electrical Conduction in Solids | From 1 |
| Week 4 | Density of States Function | From 1, From 2 |
| Week 4 | Statistical Mechanics | From 1 |
| Weeks 5, 6 | Semiconductor in Equilibrium | From 1 |
| Week 7 | Dopant Atoms and Energy Levels | From 1 |
| Week 7 | The Extrinsic Semiconductor | From 1 |
| Week 8 | Statistics of Donors and Acceptors | From 1 |
| Week 8 | Position of Fermi Energy Level | From 1 |
| Week 9 | Carrier Transport Phenomena | From 1 |
| Week 9 | Carrier Diffusion | |
| Week 10 | Carrier Generation and Recombination | From 1 |
| Week 11 | The pn Junction | From 1 |
| Week 12 | The pn Junction Diode | From 1 |
| Week 13 | Optical Devices | From 1 |
| Weeks 14, 15, 16 | Solar Cells | From 1, From 2, From 4 |

| Relationship to Program Student Outcomes (Out of 100%) | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 |
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| Policy |
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| Attendance | Attendance at the lectures is required |
| course materials | the lectures will sometimes cover material not in the textbook |
| course information | Organizational material for the course, including the course description and syllabus, the course calendar, and times of office hours and help sessions. |
| Office hours | You may visit me during office hours for any reason without an appointment. You can come at other times also, but make an appointment so that you can be sure to catch me. You can contact us by email |

Date Printed: 2021-10-10