

ELEC 7830 Spring 2025 Photovoltaics Course Outline

- I. Introduction to Solar Energy
- II. Review of Solid State Physics
- III. Solid State Physics of Photovoltaics
 - A. Single crystal Si
 - B. Polysilicon
 - C. Amorphous Si
 - D. Thin-film Si
 - E. Other semiconductors
 - F. Dye-sensitized Cells
- IV. Optical Considerations
 - A. Surface treatments
 - B. Concentrators
 - C. Sun Tracking
 - D. Shading
- V. Photovoltaic Power Electronics
 - A. Maximum power point trackers
 - B. Charge controllers
 - C. Rechargeable batteries
 - D. Inverters
 - E. Power system issues
- VI. Applications
 - A. Grid-connected
 - B. Stand-alone
 - C. Hybrid
 - D. Space
- VII. Student Presentations