**COURSE SYLLABUS**

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| **Course Title**：Optoelectronic Materials Characteristics Analysis |
| **Credits/Hours** | 3 /3 | **Course Number** | 158042 | **□Required ■Elective** |
| Course DescriptionThis course covers the fundamental aspects of optoelectronic materials, bulk crystal and epitaxial growths, characterization methods, optoelectronic devices and materials, and solar cells.  |
| **Topics** |
| **Topic** | **Content** |
| Fundamental aspects of optoelectronic materials | 1. Semiconductor fundamentals2. Electrical Conduction in Metals and Semiconductors3. Optical Properties of Electronic Materials:Fundamentals and Characterization |
| Growths and characterizations | 1. Bulk crystal and epitaxial growths. 2. Characterizations: Structural characterization, surface chemical analysis, electrical characterization of semiconductor materials and devices. |
| Materials for optoelectronics | 1. III-V compounds2. Group III Nitrides, III-V Nitride Semiconductors 3. II-IV Semiconductors 4. Transparent Conductive Oxides |
| Optoelectronic Devices and Materials | 1. Introduction to optoelectronic devices2. Light-Emitting Diodes 3. Semiconductor Lasers |
| Solar Cells  | 1. Introduction 2. Crystalline and amorphous silicon solar cells3. CdTe Thin-Film Solar Cells4. CuInGaSe2 (CIGS2) Thin-Film Solar Cells |