**COURSE SYLLABUS**

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| **Course Title：**Semiconductor-Based Solar Cell Technology | | | | |
| **Credits / Hours** | 3/3 | **Course Number** | 15800U | **□Required ■Elective** |
| **Course Description :**  To provide practical understanding of semiconductor materials and technologies on the design and development of solar cells. The course will start with a brief overview on the operation principles, followed by the introduction of traditional crystalline silicon solar cells. Then some advance solar cell technologies will be covered, such as thin-film solar cells, concentrator solar cells, organic and dye sensitized cells, and etc. | | | | |
| **Course Topics** | | | | |
| **Topic** | | **Content** | | |
| Introduction | | 1. Review of Semiconductor material properties 2. Principles of solar cell operation 3. Efficiency ;limits and losses in solar cells | | |
| Crystalline silicon solar cells | | 1. Silicon: manufacture and properties 2. Industrial technologies of crystalline silicon solar cells 3. Photovoltaic module construction | | |
| Thin-film solar cells | | 1. Amorphous silicon solar cells 2. Microcrystalline solar cells 3. Cadmium telluride thin-film PV modules 4. Cu(In,Ga)Se2 thin-film solar cells | | |
| Organic cells | | 1. Dye sensitized cells 2. Organic and plastic solar cells 3. Perovskite solar cells | | |
| Testing Monitoring and Calibration | | 1. Standards, calibration and testing of PV modules and soar cells | | |