**COURSE SYLLABUS**

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| **Course Title**：Semiconductor Engineering Practice | | | | |
| **Credits / Hours** | 3/3 | **Course Number** | 158021 | **□Required ■Elective** |
| **Course Description**  This course covers the knowledge of semiconductor process technology and integrated circuits and the trends for future developments. Especially new integrated circuit advanced technologies, such as 3D package and Fan-out will be introduced. Students can also allow to practice semiconductor process equipment to get a holistic view of semiconductor engineering technology.  \*Text Book: Introduction to Semiconductor Manufacturing Technology, Hong Xiao (SPIE)  \*Prerequisites: General physics, Semiconductor physics | | | | |
| **Course Topics** | | | | |
| **Topic** | | **Content** | | |
| Review of semiconductor physics and basics | | Quick review of crystal structure, band structure, carrier transport phenomena, junction diode and elsewhere. | | |
| Review of semiconductor manufacturing | | Quick review of wafer manufacturing, epitaxial, thermal process, plasma basics, ion implantation and elsewhere. | | |
| Advanced IC package technology | | Introducing currently advanced technologies of semiconductor such “Through-Silicon Via” and “Fan-Out” package. | | |
| Learn and practice manufacturing equipment | | Introducing the clean room environment, photolithography system, vapor deposition machine and then practice after learning. | | |
| Learn and practice characterization technology | | Introducing the analysis equipment for thin film thickness and roughness, morphology, composition, carrier mobility and then practice after learning. | | |
| Device fabrication and characterization | | Students may design a device which can be done by utilizing existing equipment with teamwork. | | |