**COURSE SYLLABUS**

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| **Course Title**：Electronic Materials | | | | |
| **Credits/Hours** | 3 /3 | **Course Number** | 158042 | **□Required ■Elective** |
| **Course Description**  This course covers elements of solid state physics and then moves on to the presentation of electrical, optical, magnetic, and thermal properties of materials. | | | | |
| **Topics** | | | | |
| **Topic** | | **Content** | | |
| Fundamentals of Electron Theory | | 1. Introduction  2. The Wave-Particle Duality  3. The Schrödinger Equation  3. Solution of the Schrödinger Equation for some Specific Problems  4. Energy Bands in Crystals  5. Electrons in a Crystal | | |
| Electrical Properties of Materials | | 1. Electrical Conduction in Metals and Alloys  2. Semiconductors  3. Electrical Properties of Polymers, Ceramics, Dielectrics, and Amorphous Materials | | |
| Optical Properties of Materials | | 1. The Optical Constants  2. Atomistic Theory of the Optical Properties  3. Quantum Mechanical Treatment of the Optical Properties  4. Applications | | |
| Magnetic Properties of Materials | | 1. Foundations of Magnetism  2. Magnetic Phenomena and Their Interpretation—Classical Approach  3. Quantum Mechanical Considerations  4. Applications | | |
| Thermal Properties of Materials | | 1. Fundamentals of Thermal Properties  2. Heat Capacity  3. Thermal Conduction  4. Thermal Expansion | | |