**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. Introduction2. The Wave-Particle Duality3. The Schrödinger Equation3. Solution of the Schrödinger Equation for some Specific Problems4. Energy Bands in Crystals5. Electrons in a Crystal |
| Electrical Properties of Materials | 1. Electrical Conduction in Metals and Alloys 2. Semiconductors3. Electrical Properties of Polymers, Ceramics, Dielectrics, and Amorphous Materials |
| Optical Properties of Materials | 1. The Optical Constants2. Atomistic Theory of the Optical Properties3. Quantum Mechanical Treatment of the Optical Properties4. Applications |
| Magnetic Properties of Materials | 1. Foundations of Magnetism2. Magnetic Phenomena and Their Interpretation—Classical Approach3. Quantum Mechanical Considerations4. Applications |
| Thermal Properties of Materials | 1. Fundamentals of Thermal Properties2. Heat Capacity3. Thermal Conduction4. Thermal Expansion |