

MSE 110 – Introduction to Solid State Chemistry

Designation:	Can substitute for CHEM 103b (pre Spring 2009); can substitute for CHEM 151 (post Spring 2009)
2012-13 catalog description:	Fundamental principles of the chemistry of condensed states of matter including metals, polymers, molecular solids and ceramics. [4 units; usually offered Fall and Spring]
Prerequisite(s):	CHEM 103A
Textbook(s) and/or other materials:	<u>Introduction to Solid State Chemistry</u> : Textbook written by MSE dept. faculties offered on a CD.
Course objectives:	To introduce and have the student retain an understanding of the chemistry of condensed matter and the relationship between micro-structure, composition and properties of materials.
Specific Instructional Goals:	(1) Develop an understanding of the nature of quantized particle and the structure of atoms. (2) Develop an understanding of the nature of different bonding types in solids. (3) Develop an understanding of specific properties of solids and their relationship to the nature of bonding and structure of solid materials. (4) Develop an understanding of periodic crystalline structures and their experimental determination. (5) Develop an understanding of basic thermodynamic concepts applied to condensed matter.
Topics covered:	Quantized atom; Bonding types in solids; Band structure and conductivity; Periodic structures and their determination; Phase diagrams; Electrochemistry; Glass; Optical materials; Semiconductor devices; Polymers
Class/laboratory schedule:	<ol style="list-style-type: none">1. Three lecture sessions per week.2. One lab hour per week3. Approximately 12 to 15 homework problems per week4. One lab report per week5. Three 1 hour class exams and a final examination.
Contribution to professional component:	Math and basic science: (70%) Engineering topics: (30%) Design experience: (0%)
Contribution to professional component:	Contribution to Learning Outcomes: ¹ 1 <u>H</u> 2 <u>NA</u> 3 <u>NA</u> 4 <u>NA</u> 5 <u>NA</u> 6 <u>NA</u> 7 <u>NA</u>
Person preparing syllabus and date:	Robert G. Erdmann, 11/16/09

¹H (high), M (medium), L (low), NA (not applicable). Determined by AME ABET Committee for Aerospace Engineering and Mechanical Engineering majors.