Guidelines of PPT & Presentation

(Tentative – subject to change)

Topics	Topic Learning Objectives & Textbook sections
Topic 1 Metals and Alloys	1. Describe how to classify the solids according to the forces which hold the particles together in different solids. (12.1: Classification of solids) 2. What are crystalline and amorphous solids? What is(are) the main difference(s) between them. (12.2 Crystalline and Amorphous solids) 3. Describe the specific physical properties of metallic solids. (12.3 Metallic solids) 4. Describe the metallic bond in details in terms of "Electron Sea Model" and "Molecular Orbital Model". (12.4 Metallic bonding) 5. Describe the alloys and its structure. Describe the Substitutional Alloy, Interstitial Alloy, Heterogeneous Alloy and Intermetallic Compounds respectively. What are the specific advantages of alloys compared with pure metal.? Introduce deferent alloys of Gold and their properties. (12.3 Alloys (P473); Chemistry Put To Work. (P476)) 6. What is shape memory alloy? Take one of memory alloys as an example to describe its properties, advantages and applications. (Ref. textbook, articles and the rich internet sources available.)
Topic 2 Polymer Solids and its applications	1. Give a brief review of metallic solids, ionic solids, molecular solids and covalent network solids. (12.3, 12.5, 12.6, 12.7). 2. What are crystalline and amorphous solids? What is(are) the main difference(s) between them. (12.2 Crystalline and Amorphous solids) 3. Briefly describe the properties of the Soft Materials: Polymers and plastics; What are thermoplastic materials or thermosetting plastics respectively? Briefly describe the ways to make polymers. Give some commonly used plastic materials with the application examples. (12.8 Polymer Solids) 4. Describe the relationships between the structure and physical properties of polymers. (12.8 Polymer Solids: structure and physical properties of polymers.) 5. Briefly describe the applications of polymers in medicine. (Ref. textbooks, articles, and the rich internet sources available)
Topic 3 Semiconductors and Silicon chip	1. Give a brief review of metallic solids, ionic solids, molecular solids and covalent network solids. (12.3, 12.5,12.6,12.7) 2. Describe the differences between conductors, semiconductors and insulators in terms of molecular bonding theory. (12.7 Semiconductors.) 3. Describe the typical characters of commonly used Elemental Semiconductors and Compound Semiconductors with examples. (12.7 Semiconductors) 4. Describe semiconductor Doping and p-n junction. (12.7 Semiconductor doping; Ref. textbooks, articles, and the rich internet sources available) 5. A brief description of silicon chips and the production of ultrapure silicon. (22.10 Occurrence and preparation of Silicon; Ref. textbooks, articles, and the rich internet sources available)
Topic 4 Semiconductors	1. What are semiconductors? What are their typical characters? (12.7 Semiconductors) 2. What is p-n junction? How does a p-n junction silicon diode work? (12.7

and LED	Semiconductor doping; Ref. textbooks, articles, and the rich internet sources available) 3. How does a light-emitting diode work? Why do the LEDs show different colors? What are commonly used Elemental or Compound Semiconductors? (Page20. Chemistry Put to Work: Replacing the Lightbulb through Chemistry; Page491. Chemistry Put to Work: Solid State Lighting; Ref. textbooks, articles, and the rich internet sources available)
Topic 5 Liquid Crystals and Liquid Crystal Displays (LCDs)	1. Describe the characters of liquid crystals and the types of liquid crystals; Describe the structure characters of liquid crystal compounds and give examples; (11.7 Liquid Crystals) 2. How do the Liquid Crystal Displays work? (Page 451. Chemistry Put to Work: Liquid Crystal displays) 3. Both of liquid crystals and semiconductors are materials to optics, what are the differences from the view of working principles between LED and LQDs?
Topic 6 Nano-Materials: Semiconductors and Metals on the Nano-scale.	1. What are Nano-materials? Describe the specific physical characters and chemical reactivity of Nano-materials. (Ref. textbooks, articles, and the rich internet sources available) 2. Describe the characters of semiconductors on the Nano-scale; what are quantum dots? Briefly describe the properties of quantum dots and its applications, especially in biological fields. (12.9 Nano materials; Ref. textbooks, articles, and the rich internet sources available) 3. Describe the characters of metals on the Nano-scale. (12.9 Nano materials; Ref. textbooks, articles, and the rich internet sources available)
Topic 7 Carbon: Fullerenes, Carbon Nanotubes and Graphene	1. Describe the Carbon materials: Diamond, Graphite, Fullerenes, Carbon nanotubes and Graphene in terms of structure and indicate the specific structural characters of Fullerenes, Carbon nanotubes and Graphene; (12.9 Fullerenes, Carbon nanotubes and Graphene; Ref. textbooks, articles, and the rich internet sources available)) 2. Describe the specific properties of Fullerenes, C-nanotubes and Graphene in details and their potential applications in future. (Ref. textbooks, articles, and the rich internet sources available))

*****: the following items must be included in every ppt report:**

1. The Name and Photo of every group member are necessary on the first page of ppt! Welcome any special individual self-introduction, briefly pls!

2. A Question/Answer section is required as the end of your ppt. Your audience are required to answer at least two questions to test their understanding of the content in your ppt. So a Q/A section must be arranged at the last page(s) of the ppt. (which must be closely related with the content of ppt)

3. You are required to provide the sources of all your reference materials by indicating the name of textbooks or articles and the names of authors or the websites at the end of ppt or the last line of each page.

4. The name of your ppt MUST be: Topic Number-Group number-Name of group leader, such as: 1-3-Li Chang.

5. Submit your ppt on SAKAI pls, the due times for different topics are announced on "Schedule of ppt and Presentation" which posted in assignment section of our course on SAKAI.