CHEM 160 Chemistry and Materials, 2003, Quarter 2

Instructor

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Texts

Burns, RA, 2003. **Fundamentals of Chemistry**, 4th Edn., Prentice-Hall

Budinski, KG & Budinski, MK, 2002. **Engineering Materials** Properties and Selection, 7th Edn., Prentice-Hall.

Timetable

Lectures: Monday 13:30-15:20, Tuesday 08:30-10:20 Laboratory: Friday, 12:30:14:30 Alternate weeks

Intended learning outcomes:

• Use the Lewis model of the atom in conjunction with the periodic table to predict the chemical and physical properties of elements, including chemical bonding and the formation of compounds.

• Write balanced chemical equations for chemical reactions including reduction-oxidation reactions, and determine stoichiometric quantities of reactants in those reactions.

• Determine properties of pure chemicals and of mixtures of chemicals based on solid, liquid and gaseous phases, and interpret solid and liquid phase diagrams for engineering materials.

• Apply the principles of thermodynamics to determine rates of chemical reaction, chemical equilibrium, and energy changes in chemical transformations.

• Apply the principles of electrochemistry to determine corrosion potential and inhibition, and electrolytic processes.

• Apply the principles of organic chemistry to the structure and naming of organic compounds, in particular polymers, and identify properties associated with specific functional groups.

Lab. Manual: Provided on course web site (**http://ccins.camosun.bc.ca/~humphreb/c160.htm**).

Evaluation Grading as in 2002/2003 Camosun College Calendar, p 39

Laboratory (4)	12%
Quizzes (3)	18%
Midterm	20%
Final	50%
Total	**100%**

Detailed outline:

Date	Day	Activity	Text
1/6/2003	Monday 1:30	Matter, atoms, molecules, Lewis	Burns, Chapters 1 to 6

		structures	
1/7/2003	Tuesday 8:30	Periodic Table, Ionic and covalent bonding	Burns, Chapters 7 and 8
1/10/2003	Friday 12:30	Lab safety **EVERYONE ATTENDS**	
1/13/2003	Monday 1:30	Polar bonds, molecular shape, polar molecules	Burns, Chapter 8
1/14/2003	Tuesday 8:30	Chemical reactions, mole, stoichiometry	Burns, Chapters 9, 10, and 11
1/17/2003	Friday 12:30	Group 1 *Lab 1* Stoichiometry	
1/20/2003	Monday 1:30	**Quiz 1;** Gases, liquids, solids	Burns, Chapters 12 and 13
1/21/2003	Tuesday 8:30	Mixtures, solutions	Burns, Chapter 14
1/24/2003	Friday 12:30	Group 2 *Lab 1* Stoichiometry	
1/27/2003	Monday 1:30	States of matter, phase changes	Burns, Chapters 12 and 13; B&B, Chapter 9
1/28/2003	Tuesday 8:30	Phase changes	B&B, Chapter 9
1/31/2003	Friday 12:30	Group 1 *Lab 2* Distillation **Full report required**	
2/3/2003	Monday 1:30	**Midterm**	
2/4/2003	Tuesday 8:30	Thermochemistry, thermodynamics, H, S, G	Burns, Chapter 11
2/7/2003	Friday 12:30	Group 2 *Lab 2* Distillation **Full report required**	
2/10/2003	Monday 1:30	Rates of reaction, equilibrium	Burns, Chapter 15
2/11/2003	Tuesday 8:30	Aqueous equilibrium	Burns, Chapter 16
2/14/2003	Friday 12:30	Reading Break College closed	
2/17/2003	Monday 1:30	Oxidation/reduction, Electrochemistry	Burns, Chapter 17
2/18/2003	Tuesday 8:30	Corrosion	Burns, Chapter 17 B&B, Chapter 12
2/21/2003	Friday 12:30	Group 1 *Lab 3* Heat of combustion	

2/24/2003	Monday 1:30	**Quiz 2**; Metals	B&B, Chapters 1 and 8
2/25/2003	Tuesday 8:30	Organic chemistry, nomenclature	Burns, Chapter 19
2/28/2003	Friday 12:30	Group 2 *Lab 3* Heat of combustion	
3/3/2003	Monday 1:30	Organic chemistry, functional groups	Burns, Chapter 19
3/4/2003	Tuesday 8:30	Organic chemistry, functional groups, reactions	Burns, Chapter 19
3/7/2003	Friday 12:30	Group 1 *Lab 4* Aspirin	
3/10/2003	Monday 1:30	**Quiz 3**; Organic reactions; polymers	B&B, Chapter 4
3/11/2003	Tuesday 8:30	Polymers	B&B, Chapters 4 and 5
3/14/2003	Friday 12:30	Group 2 *Lab 4* Aspirin	
3/17/2003	Monday 1:30	Polymers, composites	B&B, Chapters 5 and 7
3/18/2003	Tuesday 8:30	Composites, ceramics	B&B, Chapter 7
3/21/2003	Friday 12:30	Review	
3/24-28/2003 Exam Period			