

## **COURSE OUTLINE**

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The Approved Course Description is available on the web @  
<http://humphreb.disted.camosun.bc.ca/c150official.pdf>

*Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for your records.*

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### **1. Instructor Information**

- (a) Instructor Blair Humphrey
- (b) Office hours 9:30-10:20, T,W,R,F; 1:30-2:20, T,W,R
- (c) Location TECH 232
- (d) Phone 370-4447
- (e) E-mail [humphreb@camosun.bc.ca](mailto:humphreb@camosun.bc.ca)
- (f) Website <http://humphreb.disted.camosun.bc.ca/c150.htm>

### **2. Intended Learning Outcomes**

- Calculate outcomes of chemical reactions based on stoichiometric quantities in general and in aqueous solutions in particular.
- Describe the electronic configuration of atoms and explain why some atoms have unusual configurations.
- Determine the shape and symmetry of molecules based on atomic, molecular, and hybrid orbitals.
- Explain the impacts of bond polarity on molecular interactions on the physical states (phases) of molecules.
- Calculate the properties of ideal gases.
- Describe the differences between ideal and non-ideal gases.
- Determine the properties of polymers, ceramics and other engineering materials based on bonding and molecular interactions.
- Calculate physical properties of solutions.
- Determine rate constants, order of reaction and activation energy for simple chemical reactions.
- Determine concentrations of participating molecules in chemical equilibria, in particular, aqueous equilibria.
- Determine the pH of dilute aqueous solutions of acids and bases.
- Explain the importance of total energy, enthalpy, entropy and free energy in chemical processes.
- Balance redox reactions. Determine the voltages of simple electrochemical cells. Describe the role of electrochemistry in corrosion and corrosion control.
- Use orbital theory to describe the properties of metals and semiconductors.

### **3. Required Materials**

(a) Texts  
 Glanville, J. "Chemistry for Engineers", Prentice Hall, Revised Printing of Second Preliminary Edition. Recommended only.

(b) Other  
 Access to web, graphing calculator (TI 89 recommended)

#### 4. Course Content and Schedule

|                    | <i>Topics</i>   |                                   |
|--------------------|---|-----------------------------------|
| June 26<br>June 30 | Introduction, measurement and the scientific method. Atoms, elements, molecules, compounds, mixtures, ionic and covalent molecules, the mole The periodic table, nomenclature: naming compounds Chemical reactions, |                                   |
| July 4 – 7         | <b>Quiz 1</b> , Stoichiometry. Thermochemistry. Atomic structure,   | 1: Density                        |
| July 10 – 14       | Periodic properties. Bonding.   | Lab closed                        |
| July 17 – 21       | Molecular structure. Molecular shape, size and bond strength. Molecular orbitals, hybrid orbitals. <b>Quiz 2</b>  | Lab closed                        |
| July 24 – 28       | Gases. Intermolecular forces Liquids, vapour pressure, mixtures, phase diagrams. Solutions Solids, structure and bonding.   | 2:<br>Stoichiometry               |
| July 31 – Aug. 4   | <b>Midterm</b> includes up to atomic structure. Polymers and ceramics, Kinetics   | 4: Thermo-chemistry               |
| Aug. 8 – 11        | Equilibrium. Acid/base equilibria   | 6: Distillation                   |
| Aug. 14 – 18       | Aqueous equilibria <b>Quiz 3</b>  | 7:<br>Determination of chloride   |
| Aug 21 – 25        | Thermodynamics  | 8: Kinetics                       |
| Aug. 28 – Sep. 1   | Electrochemistry <b>Quiz 4</b>  | 9: pK <sub>a</sub> of acetic acid |
| Sep. 5 – 8         | Metals, semi-conductors   | Tutorial                          |
| Sep. 11 - 15       | Exam period   |                                   |

#### 5. Basis of Student Assessment (Weighting)

|                 |          |     |
|-----------------|----------|-----|
| (a) Assignments | 0%       |     |
| (b) Quizzes     | 4 total  | 25% |
| (c) Exams       | Midterm: | 15% |
|                 | Final:   | 50% |
| (d) Labs:       |          | 10% |

## 6. Grading System

Standard Grading System (GPA)

|      |         |      |        |     |        |
|------|---------|------|--------|-----|--------|
| A+ = | 95-100% | B+ = | 80-84% | C = | 60-64% |
| A =  | 90-94%  | B =  | 75-79% | D = | 50-59% |
| A- = | 85-89%  | B- = | 70-74% | F = | 0-49%  |
|      |         | C+ = | 65-69% |     |        |

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at [camosun.ca](http://camosun.ca) for information on conversion to final grades, and for additional information on student record and transcript notations.

## 7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar, at Student Services or the College web site at [camosun.ca](http://camosun.ca)

### STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services, and on the College web site in the Policy Section.