



Course Documentation Outline

School of Business, Biosciences and Justice Studies

SECTION I

1. Program (s): Chemical
- 2.
3. Course Name: Chemical Engineering
4. Course Code: CHEM 2003
5. Credit Value: 5 Course Hours: 75

Class	Lab	Field	Other	Total
45	30			75

5. Prerequisites/Corequisites/Equivalent Courses

PR/CO/EQ	Course Code	Title

6. **Faculty:** Elinor Brunet **Date:** Jan 4, 2010 **Effective Date:** Jan 11, 2010
7. **Dean Approval:** *Dan Holland* **Date:** January 2010
9. **Revision Number:** **Date:** **Effective Date:**
- 10: **Notes**

Section II

11. Calendar Description:

An introductory course that deals with the various operations, calculations, and processes found in chemical industries. Distillation, fluid flow, evaporation, humidity and heat exchange are introduced.

12. Provincial Context:

This course meets the following Ministry of Education and Training requirements:

a). Prior Learning Assessment (PLA)

Students may apply to receive credit by demonstrating achievement of the course learning outcomes through previous life and work experiences.

This course is eligible for challenge through the following method(s) indicated by *

Challenge Exam	Portfolio	Interview	Other	Not Eligible
*	*	*		

PLAR Contact:

13. Employability Skills emphasized in this course

	communication - written		communication - visual		communication - oral
*	analytical		creative thinking	*	decision making
*	interpersonal	*	numeracy	*	organizational
*	problem solving	*	technological		other (specify)

14. Required Texts, Materials, Resources or Technical Materials Required:

Laboratory manual produced at the College, lab coat and safety eyewear (CSA approved) with colourless lenses, as well as a scientific calculator capable of linear regression.

15. Evaluation Plan

Students will demonstrate learning in the following ways:

Assignment Description	Evaluation Methodology	Due Date
Lab reports	30%	weekly
Assignments and quizzes	45%	ongoing
Final exam	25%	Apr 2010

16. **Other**

Policy for missed tests/work and submission of assignments:

Students are expected to make every reasonable effort not to miss tests and to submit all assigned work on time! Students must advise the instructor **in advance** if they are unable to meet scheduled deadlines, **otherwise late assignments will not be accepted for evaluation and a grade of zero will be assigned.** Every effort will be made to accommodate students unable to meet specified deadlines as a result of extenuating circumstances; however, the instructor reserves the right to refuse late assignments and to refuse to reschedule assessments.

The total of the marks for the labs, assignments and quizzes, mid term test and final test must be equal to or greater than **60%** to obtain a pass in this course.

All students must pass the end of term test with 50% or better in order to pass the course.

The final exam will include material from the entire semester from both the theory class and calculations performed during the labs. The style of the questions will be exactly the same as those contained in the assignments and quizzes.

All labs must be performed, and the associated report for each lab must be submitted for grading. Only one lab may be 'made up' during the scheduled make up lab at the end of the semester.

Loyalist College has a Violence Prevention policy:

- All College members have a responsibility to foster a climate of respect and safety, free from violent behaviour and harassment.
- Violence (e.g. physical violence, threatening actions or harassment) is not, in any way, acceptable behaviour.
- Weapons or replicas of weapons are not permitted on Loyalist College property.
- Unacceptable behaviour will result in disciplinary action or appropriate sanctions.
- More information can be found in the "Student Manual and Guide - Rights & Responsibilities".

Contact information for Elinor Brunet:

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Section III

17. Curriculum Delivery, Learning Plan and Learning Outcomes:

Course Components/Content	Related Learning Outcomes	Learning Activities/Resources
<p>Physical Properties of solids, liquids and gases</p>	<p>The student will gain an understanding of the basic properties of solids, liquids and gases.</p> <ul style="list-style-type: none"> - solid density - bulk density - particle size (sieve analysis) - liquid density - liquid viscosity - review of other physical properties of solids, liquids and gases 	<p>Curriculum objectives will be achieved through a combination of the following teaching strategies:</p> <ol style="list-style-type: none"> 1. Lecture 2. Laboratory activities (guided and discovery) 3. Simulation (computer) and field activity 4. Cooperative study 5. Independent study (i.e. required readings and exercises) <p>Lab:</p> <p>Density</p> <p>Viscosity</p> <p>Particle Size</p> <p>Mixing Tank</p>
<p>Flow of Fluids in Pipes</p>	<p>The student will work with calculations in the following topics:</p> <ul style="list-style-type: none"> - Velocity and viscosity relationships - Pressure in pipes - Reynolds Number calculations - Laminar and turbulent flow differences - Friction losses in pipes and those caused by bends, pumps and valves - Pipeline Tables and graphs 	<p>Lab:</p> <p>Fluid Flow</p>

<p>Heat Transfer by Convection in Tube and Shell Heat Exchangers (co-current and counter current)</p>	<p>Calculations will be performed based on/for the following topics :</p> <p>Temperature measurement and scales Steam tables Types of heat exchangers Temperature profiles graphed Overall coefficient of heat transfer will be calculated</p>	<p>Lab: Heat Exchange</p>
<p>Evaporation</p>	<p>The student will learn how to prepare the following for evaporator applications:</p> <p>Material balance Energy balance Boiling point rise Evaporator capacity</p>	<p>Lab: Evaporation</p>
<p>Distillation</p>	<p>The student will collect lab data and learn to calculate the efficiency of the distillation column.</p> <ul style="list-style-type: none"> - Equilibrium mixtures - Material balances - Continuous distillation - Overall plate efficiency - H.E.T.P. 	<p>Lab: Distillation</p>
<p>Humidification and Dehumidification</p>	<p>The student will learn how to obtain information from humidity charts</p>	
<p>As time permits: Drying and Filtration</p>	<p>The student will learn about:</p> <ul style="list-style-type: none"> - Types of driers: uses, material balances on and applications - Effect of humidity on drying - Types of filters: uses and applications - How constant pressure and/or constant rate feed rate affects the rate of filtration 	