

**UNIVERSITY COLLEGE OF THE FRASER VALLEY**

**COURSE INFORMATION**

**DISCIPLINE/DEPARTMENT:** Chemistry **IMPLEMENTATION DATE:** January 1995

**Revised:** ~~November 1996~~

<u>CHEM 441</u>	<del>Analytical Chemistry/Applied</del>	
<b>SUBJECT/NUMBER OF COURSE</b>	Molecular Spectroscopy	<u>4</u>
<b>CREDITS</b>	<b>DESCRIPTIVE TITLE</b>	<b>UCFV</b>

**CALENDAR DESCRIPTION:** This course covers the fundamentals of modern analytical chemistry and applied spectroscopy. Lecture material includes data and sample handling, classical techniques, instrumental methods, the principles of chromatography and applied spectroscopy. Laboratory experiments illustrate the lecture material.

**RATIONALE:**

**COURSE PREREQUISITES:** CHEM 211 and 212

**COURSE COREQUISITES:** None

<b>HOURS PER TERM FOR EACH STUDENT</b>	<b>Lecture</b>	<b>56</b>	<b>hrs</b>	<b>Student Directed Learning</b>		
	<b>Laboratory</b>	<b>32</b>	<b>hrs</b>	<b>Other - specify:</b>		
	<b>Seminar</b>		<b>hrs</b>	Extra lab time	<b>24</b>	<b>hrs</b>
	<b>Field Experience</b>		<b>hrs</b>	<u>for exams/seminars</u>		
				<b>TOTAL</b>	<b>112</b>	<b>HRS</b>

**MAXIMUM ENROLMENT:** 24

Is transfer credit requested? **9** Yes : No

<b>AUTHORIZATION SIGNATURES:</b>	
Course Designer(s): <u>L. Martin</u>	Chairperson: <u>T. Cooper</u> Curriculum Committee
Department Head: <u>A. Last</u>	Dean: <u>W. Welsh</u>
PAC: Approval in Principle _____ (Date)	PAC: Final Approval: <u>November 27, 1996</u> (Date)

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**SYNONYMOUS COURSES:**

(a) replaces \_\_\_\_\_  
(course #)

(b) cannot take \_\_\_\_\_ for further credit  
(course #)

**SUPPLIES/MATERIALS:**

**TEXTBOOKS, REFERENCES, MATERIALS (List reading resources elsewhere)**

Fundamentals of Analytical Chemistry by Skoog et al. Required.

**OBJECTIVES:**

Students will become competent with a wide variety of analytical techniques. They will be able to display their expertise in understanding the lecture material and handling the laboratory equipment. They will possess the knowledge necessary to assess the reliability of both new and existing analytical methods.

**METHODS:**

Lecture, labs, group problem solving sessions. (Some of the labs will be projects the students will plan themselves.)

**STUDENT EVALUATION PROCEDURE:**

Midterms	25%
Labs	45%
Final	30%

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**COURSE CONTENT:**

1. Data handling - uncertainty and errors, accuracy and precision, calibration of instruments, blanks and standards
2. A brief overview of the nature of solutions and equilibrium considerations
3. Gravimetric and volumetric techniques
4. Principles of chromatography
5. Principles of applied spectroscopy

**LABORATORY EXPERIMENTS:**

1. Analysis of 50 samples of lake water with an autoanalyzer
2. Gravimetric lab
3. ISE lab
4. ICP lab
5. GC lab
6. HPLC lab
7. & 8. Qualitative analysis of unknowns using NMR and IR techniques
9. Volumetric lab using an autotitrator