

NEW COURSE PROPOSAL

PROGRAM: BIOLOGICAL AND PHYSICAL SCIENCES

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

CHEM 250. QUANTITATIVE ANALYSIS (2)

Two hours of lecture per week.

Prerequisites: CHEM 122 with a grade of C or better.

Corequisite: CHEM 251

An examination of the theory and techniques involved in the quantification of inorganic, organic, and biological species from samples with an emphasis on the environmental, biological, and medical applications of the analysis techniques.

2. **Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture	2	1	36
Seminar			
Laboratory			
Activity			

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

Quantitative Analysis is the study of the analysis of chemical compounds using commonly used laboratory techniques. This course is the lecture portion that is concurrently taken with the lab (CHEM 251). These two courses are required for the Environmental Science Emphasis in the B.S. in Environmental Science and Resource Management major.

Students who successfully complete this course will be able to:

- Quantitatively determine the statistical relevance and error of data determined in the chemistry laboratory
- Describe the scientific method and how it is used to approach the study of chemical data obtained from the laboratory
- Analyze chemical samples based on commonly used titration methods based on acid-base, solubility, and oxidation-reduction chemistry
- Explain the elements of basic spectroscopic techniques used in chemical analysis
- Evaluate the limitations of analytical techniques based on information obtained by the technique and error associated with the measurement
- Describe the fundamentals behind separation analysis of chemical species
- Identify the latest technology available which uses the fundamentals of the techniques used in laboratory

4. **Is this a General Education Course**
If Yes, indicate GE category:

YES

NO

5. **Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

Introduction to Quantitative Analysis
Statistical Analysis and Error in Analytical Data
Gravimetric Methods of Analysis
Titrimetric Methods of Analysis

Acid-Base Titrations
Complex Formation Titrations
Solubility Equilibria and Precipitation Titrations
Oxidation-Reduction Titrations
Potentiometric Methods of Analysis
Spectroscopic Techniques
Spectrophotometry
Emission Spectroscopy
Separations
Solvent Extraction
Gas-Liquid Chromatography
Liquid Chromatography
The Chemistry Lab of the Future

6. References. [Provide 3 - 5 references on which this course is based and/or support it.]

Harris, D.C. *Quantitative Chemical Analysis*, 6th Ed., 2002
Day, R.A., Jr.; Underwood, A.L., Jr., *Quantitative Analysis*, 6th Ed., 1991
De Levie R. *Principles of Quantitative Chemical Analysis*, 1996
Skoog, D.A.; West, D.M.; Crouch, S.R.; Holler, F.J. *Analytical Chemistry: An Introduction*, 7th Ed., 1999

7. List Faculty Qualified to Teach This Course.

Dr. Simone Aloisio

8. Frequency.

a. Projected semesters to be offered: Fall X Spring _____ Summer _____

9. New Resources Required.

None.

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

_____Philip Hampton_____1/8/03_____
Proposer of Course Date