

ANALYTICAL CHEMISTRY (CHM 222)**Instructor:** Sunghee Lee, Ph.D**Office:** Cornelia 105**Phone:** 914-633-2638**FAX:** 914-633-2240**E-mail:** slee@iona.edu**Credits:** 2 credits**Lecture Meeting Times:** Monday 1:00PM**Laboratory Meeting Times:**

Monday 2:00-5:00 PM

Lecture/Lab. Location: Cornelia 205**Office Hours:** M, W, F 9:00 AM(Or other times by mutual agreement)

COURSE DESCRIPTION:

Analytical Chemistry is an indispensable tool in all phases of chemically related research and provides an invaluable function to the advance of many sciences. Analytical Chemistry (CHM 222) is one semester introductory course designed to equip students with the fundamental skills of basic analytical chemistry and instrumentation that can be transferred to various other disciplines in science. This course introduces the principles of chemistry applied to the separation, detection, identification, and quantification of samples of matter. Topics include statistics of analytical chemistry, qualitative and quantitative analysis with examples from volumetric methods of analysis, concepts of acid-base, redox, precipitation, electrochemical behavior, titrimetric, spectrophotometric, and chromatographic analysis. The laboratory experiments are aimed to provide an organized principle more efficiently to the students. The sequence of laboratories is organized to deal with more interesting real-world samples with biological and environmental perspective. This course is designed for both students majoring in chemistry and non-chemistry disciplines such as the biological and environmental sciences.

COURSE OBJECTIVES:

The objectives of the sequence of lectures and experiments in this course include:

- To introduce students fundamental principles in analytical chemistry;
- To provide students with hands-on experience in fundamental laboratory skills and analytical techniques that can be transferred to other disciplines in science;
- To provide students a various experience in training at the interface of Chemistry/Biology/Environmental science.

PREREQUISITE: General Chemistry (CHM110)**REQUIRED TEXT:** D.C. Harris, Exploring Chemical Analysis, 3rd Ed., W.H.Freeman, 2005

OTHER RECOMMENDED REFERENCES:

1. Fundamentals of Analytical Chemistry, 8th ed. D.A.Skoog, D.M.West, F.J.Holler, S.R.Crouch, 2004, Thomson Publishing.
2. Modern Analytical Chemistry, David Harvey, 2000, McGraw-Hill.
3. Quantitative Chemical Analysis, 5th Ed., Daniel C. Harris, 1998, W.H.Freeman and Co.

LABORATORY WORK:

The laboratory work is an integral part of the course in "Analytical Chemistry" and the grade in the laboratory work will be a part of the course grade. The primary objectives of the laboratory are to introduce the student to current analytical methods and to develop sound experimental technique. Laboratory experiments are based on topics selected from the lectures and introduce the student to a wide variety of analytical methods. Laboratory reports are due one week following the experiment. Five (5) points will be deducted for each day past the deadline, up to five days. Any report more than 5 days late will not be accepted and a grade of zero will be assigned. The written laboratory report will follow the guideline set by the American Chemical Society (ACS). These reports will include;

- Abstract
- Purpose and Introduction of the experiment
- A brief description of the procedures and descriptions of your understanding of how the analytical technique works
- Signed data pages
: All data must be recorded in ink on the data pages provided or on other clearly labeled pages. The data pages used during the laboratory class must be dated and signed by the student and countersigned by the instructor. Erasures or other obliteration of recorded data will invalidate the data page.
- Data analysis with clearly written calculations (graphs and statistical analysis)
- A clear statement of experimental results
- Conclusion and discussion based on the experimental results

Students are expected to be on time for the laboratory class in order to learn of any modifications of the experiment and to learn of any special safety precautions. Students should plan to be in laboratory for the full three hours. There is no opportunity to do make-up labs.

LITERATURE SEARCHES:

Students will use the library databases to search an article (or assigned topics) using the American Chemical Society Full Text Database covering all ACS journals.

ASSIGNMENTS:

There will be regular problem set assignments which will be graded for 15% of your final grade. These assignments should be completed as carefully as possible, since this material will be on the cumulative final exam. Late assignment beyond the due dates will not be accepted, and will result in a grade of zero.

Evaluation: Final evaluation in this course will be based upon the following.

Two 1HOUR EXAMS	20%
One 2 HOUR Cumulative Final	25%
Problem Set	15%
LABORATORY REPORTS	30%
Preparation/Participation/Performance	10%
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Total =	100%

Policy on Plagiarism and Academic Dishonesty:

Evidence of academic dishonesty in any exam or laboratory reports will result in a score of zero on the paper in question and may result in other disciplinary action. A score of zero earned in this manner will not be replaced or omitted from the student's course average, regardless of any other provisions in the grading policy.