

This syllabus is provided as a general informational guide. Some of the information may vary depending on the specific course section and instructor. Different sections of the same course may require different textbooks. Verify the section specific textbook information in the CUNY's Academic Course Schedule Web Page. Modifications of the grading system presented here will be communicated by the instructors of the sections when they meet the class.

BOROUGH OF MANHATTAN COMMUNITY COLLEGE

The City University of New York
Department of Science

Title of Course	Quantitative Analysis	Credits 4
Course Code	CHE205	Hybrid Class. Meetings on Mo & Tu
Semester		Laboratory Hours per Week 6

Instructor Information Luis Gonzalez Urbina
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Course Description

This course discusses the principles of classical and instrumental techniques in analytical chemistry. Laboratory experiments include gravimetric, volumetric and instrumental methods of analysis.

This a **hybrid class**. Lecture will be delivered online using Blackboard. 4 non-cumulative **Tests and the Final Exam** will be taking **in person** on designated days. Laboratory attendance is mandatory. A **Laboratory Exam** will be part of the laboratory grade.

Required in A.S. Forensic Science

Elective in A.S. Science

Basic Skills ACR 095, ENG 095 or ESL 095, and MAT 056

Prerequisites CHE 202, MAT 206 or Permission of the Department of Science

The student is responsible of accessing and completing the work assigned through Blackboard each week. Because of the nature of the course extensions are not possible. In person meetings are mandatory and will take place the days indicated in the schedule. The instructor reserves the right to change the scheduled Test days if necessary to accommodate the Test into another day.

Course Student Learning Outcomes (Students will be able to...)	Measurements (means of assessment for student learning outcomes listed in first column)
1. Understand the chemical principles important to analytical chemistry.	1. Examinations, homework assignments and laboratory experiments
2. be able to determine the accuracy and precision of experimental data.	2. Examinations, homework assignments and laboratory experiments
3. have laboratory skills necessary to solve analytical problems quantitatively	3. Laboratory experiments and practical exam
4. be able to obtain high quality analytical data.	4. Laboratory experiments and practical exam

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Below are the college's general education learning outcomes, the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course.

	General Education Learning Outcomes	Measurements (means of assessment for general education goals listed in first column)
<input type="checkbox"/>	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
<input checked="" type="checkbox"/>	Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Students will solve problems requiring algebraic manipulation and exponential notation as well as to analyze graphical experimental data.
<input checked="" type="checkbox"/>	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	Examinations, homework assignments and laboratory observations.
<input type="checkbox"/>	Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
<input type="checkbox"/>	Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	
<input type="checkbox"/>	Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	
<input type="checkbox"/>	Values- Students will be able to make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility.	

Required Text

Skoog, D.A., West, D.M., Holler, F.J., and Crouch, S.R. *Fundamentals of Analytical Chemistry 9th Edition* Thomson/Brooks/Cole, 2004

Other Resources Blackboard

Use of Technology (If Applicable) Scientific Calculator and basic knowledge of a word processor and Excel

Evaluation and Requirements of Students

Five Tests 4 @ 10 %	40%
Final Examination (comprehensive)	10%
Laboratory (notebook & reports)	40%
Laboratory Exam	10%

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Lecture

Outline of Topics

	Tests	Week	Topic	Chapters	
Final Exam	1 st	1	Nature of Analytical Chemistry Apparatus and Calibration of equipment	1 2 & <u>8</u>	
		2	Calculations and Errors in chemical analysis. Random errors	<u>4</u> & 5 6	
		3	Using spreadsheets and Statistical data treatment	3 & 7	
	2 nd	4	Aqueous solutions and Chemical Equilibria	9	
		5	Effect of electrolytes on Chemical equilibria	10	
		6	Gravimetric methods of analysis	12	
	3 rd	7	Titration	13	
		8	Neutralization titrations	14	
	4 th	9	Spectrochemical Methods	<u>24</u> & <u>25</u>	
		10	Molecular Absorption Spectrometry	26	
		11	Molecular Fluorescence Spectroscopy	27	
		12	Atomic Spectroscopy	28	
			13	Introduction to electrochemistry	18
			14	Applications of Standard Electrode Potentials	19
			15	FINAL EXAM	

Underlined; selected sections only

Laboratory

List of Experiments

Calibration of analytical volumetric equipment
 Penny statistics
 Gravimetric analysis of Chloride
 Gravimetric analysis of Calcium
 Gravimetric analysis of Iron
 Statistical evaluation of Acid-Base Indicator
 Spectrophotometric analysis of a mixture
 Cholesterol
 Standardization of Sodium Hydroxide
 Acid-Base titration – The Gran Plot
 Analysis of a mixture of Carbonate + Bicarbonate

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Class Participation

Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student's responsibility to be familiar with and follow the participation policies for each course.

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

Single Stop www.bmcc.cuny.edu/singlestop, room S230, 212-220-8195. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, come by the Single Stop Office for advice and assistance. Assistance is also available through the Office of Student Affairs, S350, 212-220-8130.

Counseling Center www.bmcc.cuny.edu/counseling, room S343, 212-220-8140. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

Office of Compliance and Diversity www.bmcc.cuny.edu/aac, room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

Office of Accessibility www.bmcc.cuny.edu/accessibility, room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).