

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

City University of New York

Department of Science

Title of Course Fundamentals of General,
Organic and Biological Chemistry II

CHE 122

Semester Fall 2017

Credits 4

Class hours 3

Lab hours 3

Instructor Name:

Office:

Telephone:

Email:

A. COURSE DESCRIPTION:

Fundamentals of General, Organic and Biological Chemistry I CHE 121

Fundamentals of General, Organic and Biological Chemistry II CHE 122

4 cr. 3 hrs. 3 lab hrs. (per term)

This course is a two semester course sequence that introduces principles and concepts of general, organic and biological chemistry. The laboratory will provide experimental applications of these chemical topics.

CHE 121-CHE 122 Liberal Arts Elective. This course is recommended for students intending to transfer to bachelor degree nursing and allied health science curricula.

CHE 121-CHE 122 cannot be granted credit to fulfill degree requirements for A.S. (Science), and for A.S. (Engineering Science).

CHE 121-CHE 122 does not meet science requirement for A.A. (Liberal Arts).

Two terms required.

Prerequisites/Co-requisites

Course Student Learning Outcomes (Students will be able to...)	Measurements (means of assessment for student learning outcomes listed in first column)
1. identify and define key terminology in chemistry.	Quizzes, examinations and lab reports.
2. explain chemical properties	Quizzes, examinations and lab reports.
3. apply chemical concepts to chemical properties.	Quizzes, examinations and lab reports.
4. compare chemical properties based on chemical models.	Quizzes, examinations and lab reports.
5. categorize chemical properties based atomic and molecular structure.	Quizzes, examinations and lab reports.
6. evaluate the effect of changes in variables on chemical properties.	Quizzes, examinations and lab reports.

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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. (Check at least one.)

	General Education Learning Outcomes	Measurements (means of assessment for general education goals listed in first column)
	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
x	Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Lab assignments and reports.
x	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	Quizzes, examinations and lab reports.
<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.	

Prerequisites: CHE 118, CHE 121, Or Permission of the Department of Science.
Basic Skills Prerequisites: ACR 094, ENG 088 or ESL 062, and MAT 051.

Required Text & Readings

Timberlake, Karen C., *General, Organic and Biological Chemistry Fifth Edition*, Pearson Prentice Hall (2015) 978-0-321-96746-1

Timberlake, Karen C., *Laboratory Manual for General, Organic, and Biological Chemistry Third Edition*, Pearson, (2014) ISBN 978-0-321-81185-1

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Other Resources

Use of Technology (if applicable)

Evaluation & Requirements of Students

Five Examinations 5 @ 12%	60%
Final Examination (comprehensive)	20%
Laboratory	20%

College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

Academic Adjustments for Students with Disabilities

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities (Room N-769; Telephone # 220-8180). BMCC is committed to providing to all students equal access to all programs and curricula.

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).

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Outline of Topics			
Week	Ch / Sec	Topic	Pages
1	12.1	Organic Compounds	444 - 447
	12.2	Alkanes	447 - 451
	12.3	Alkanes with Substituents	451 - 457
	12.4	Properties of Alkanes	457 - 460
Unsaturated Hydrocarbons			
2	12.5	Alkenes and Alkynes	460 - 463
	12.6	Cis-Trans Isomers	464 - 467
	12.7	Addition Reactions	468 - 473
	12.8	Aromatic Compounds	473 - 476
Alcohols, Phenols and Thiols			
3	13.1	Alcohols, Phenols and Thiols	489 - 495
	13.2	Ethers	495 - 497
	13.3	Physical Properties of Alcohols, Phenols and Ethers	497 - 500
	13.4	Reactions of Alcohols and Thiols	501 - 506
Aldehydes, Ketones and Chiral Molecules			
4	14.1	Aldehydes and Ketones.	517 - 522
	14.2	Physical Properties of Aldehydes and Ketones	523 - 524
	14.3	Oxidation and Reduction of Aldehydes and Ketones	525 - 527
5	14.4	Hemiacetals and Acetals	527 - 530
	14.5	Chiral Molecules	531 - 538
Carbohydrates			
6	15.1	Carbohydrates	551 - 554
	15.2	Fischer Projection of Monosaccharides	554 - 558
	15.3	Haworth Structures of Monosaccharides	558 - 561
	15.4	Chemical Properties of Monosaccharides	561 - 564
	15.5	Disaccharides	564 - 570
	15.6	Polysaccharides	570 - 573
Carboxylic Acids and Esters			
7	16.1	Carboxylic Acids	581 - 585
	16.2	Properties of Carboxylic Acids	585 - 590
	16.3	Esters	590 - 593
	16.4	Naming Esters	593 - 596
	16.5	Properties of Esters	596 - 600
Lipids			
8	17.1	Lipids	609 - 610
	17.2	Fatty Acids	610 - 616
	17.3	Waxes and Triacylglycerols	617 - 620

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	17.4	Chemical Properties of Triacylglycerols	621 - 626
	17.5	Phospholipids	627 - 632
	17.6	Steroids	632 - 637
	17.7	Cell Membranes	638 - 640
		Amines and Amides	
9	18.1	Amines	650 - 656
	18.2	Properties of Amines	656 - 661
	18.3	Heterocyclic Amines	661 - 664
	18.4	Neurotransmitters	664 - 671
	18.5	Amides	671 - 676
	18.6	Hydrolysis of Amides	676 - 677
		Amino Acids and Proteins	
10	19.1	Proteins and Amino Acids	689 - 694
	19.2	Amino Acids as Acids and Bases	694 - 697
	19.3	Formation of Peptides	697 - 700
	19.4	Protein Structure: Primary and Secondary Levels	701 - 706
	19.5	Protein Structure: Tertiary and Quaternary Levels	706 - 711
	19.6	Protein Hydrolysis and Denaturation	711 - 714
		Enzymes and Vitamins	
12	20.1	Enzymes and Enzyme Action	723 - 726
	20.2	Classification of Enzymes	726 - 729
	20.3	Factors Affecting Enzyme Activity	729 - 732
	20.4	Regulation of Enzyme Activity	732 - 735
13	20.5	Enzyme Inhibition	735 - 739
	20.6	Enzyme Cofactors and Vitamins	739 - 744
		Nucleic Acids and Protein Synthesis	
	21.1	Components of Nucleic Acids	754 - 759
	21.2	Primary Structure of Nucleic Acids	759 - 761
	21.3	DNA Double Helix	761 - 763
14	21.4	DNA Replication	764 - 766
	21.5	RNA and Transcription	766 - 771
	21.6	The Genetic Code and Protein Synthesis	771 - 775
	21.7	Genetic Mutations	776 - 780
	21.8	Recombinant DNA	780 - 782
	21.9	Viruses	782 - 785

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Expt	Title	Page
	Laboratory Safety and Laboratory Rules	
	Hydrocarbon Structures	
22	Reactions of Hydrocarbons	251
23	Alcohols and Phenols	259
24	Aldehydes and Ketones	269
29	Types of Carbohydrates	323
30	Tests for Carbohydrates	337
25	Carboxylic Acids and Esters	279
31	Lipids	349
27	Amines and Amides	303
33	Amino Acids	373
34	Peptides and Proteins	383
35	Enzymes	395
	DNA Components and Extraction	