

GENERAL CHEMISTRY 1B, CHEM 2050 –Fall 2020

Required Texts:

- *Chemistry 2e*, P. Flowers, OpenStax, 2019

This text is available as a free PDF at

<https://openstax.org/details/books/chemistry>

It is also available free for Kindle at <http://www.amazon.com>

You can order a hard copy through <https://brooklyn.textbookx.com/adm/> or from <http://www.amazon.com> – but you can always print chapters from the PDF.

- *Experiments in General Chemistry*, M. N. KobraK, Ed., **Third or Fourth** edition. Kendall/Hunt, Dubuque, IA, 2012 (2017).

Learning Objectives for Chemistry 2050

Upon completion of this course, students should:

- Understand the basic physical principles underlying chemistry and be able to apply them both to qualitatively explaining phenomena and quantitatively predicting or interpreting outcomes.
- Be able to perform simple chemical techniques and apply chemical theory in the laboratory setting.
- Understand and be able to explain fundamental ideas in the practice of science, including the nature of scientific evidence, the scientific method, and appropriate practices with respect to record-keeping, safety, and treatment of data.
- Students should be able to apply principles of chemistry to understanding its role in other fields (e.g. biology), while understanding its underpinnings in physics and mathematics.

Required Items:

- Scientific calculator (Note: Your computer probably has a scientific calculator.)

Online Supplements and Info:

www.brooklyn.cuny.edu/web/aca_naturalsciences_chemistry/Courses_Chem1100-Spr15-Syllabus.pdf
(online **syllabus**)

<http://academic.brooklyn.cuny.edu/chem/howell/practice.htm> (old BC chemistry **exams**)

<http://www.brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/chemistry.php>
(Chemistry Department Homepage)

<http://www.brooklyn.cuny.edu/web/academics/honors/prehealth.php> (Pre-Health Professions website)

http://www.brooklyn.cuny.edu/web/aca_honors/131125_PrehealthProfessionsHandbook.pdf

<http://userhome.brooklyn.cuny.edu/mkobraK/labvideos.html> (Lab instruction videos)

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<u>Counseling</u>	<i>Coordinator for General Chemistry</i>	Prof. Joann Mathias, 3315 N jmathias@brooklyn.cuny.edu
	<i>Undergraduate Chemistry Advisor:</i>	Prof. Aneta Mieszawska Aneta.Mieszawska@brooklyn.cuny.edu
	<i>Health Profession Counseling:</i>	Prof. Silbering 2231B silbering@brooklyn.cuny.edu

LECTURE TESTS:

FIRST TEST: 11:00 A.M. – 12:30 P.M. Tuesday, October 6
SECOND TEST: 11:00 A.M. – 12:30 P.M. Tuesday, November 17
FINAL EXAM: 10:30 A.M. – 12:30 P.M., Tuesday, December 15

NO MAKEUP EXAMS ARE GIVEN FOR MISSED LECTURE TESTS.

Tests are administered via Blackboard, which is unforgiving regarding start and end times. Regardless of when you begin the test or quiz, Blackboard will not tolerate any tests handed in after the set time and will certainly not accept any excuses. Please take the start and end times for the tests and quizzes seriously; you will not be given a second chance.

LECTURER CONTACT INFORMATION AND OFFICE HOURS:

A. EISENBERG

E-MAIL: AEISENBERG@BROOKLYN.CUNY.EDU

OFFICE HOURS: ~12:30 P.M. – 1:30 P.M. TUESDAY

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GRADING: Your final grade will be a weighted average calculated as follows: 30% Two lecture tests 20% Quiz average (minimum 4 quizzes) 18% Laboratory reports 7% Two laboratory quizzes 25% Final Exam	Final grades are not curved, but are set according to the following scale: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">95 or higher: A+</td><td style="width: 50%; padding: 5px;">68-70: C+</td></tr> <tr> <td style="padding: 5px;">87-95: A</td><td style="padding: 5px;">62-68: C</td></tr> <tr> <td style="padding: 5px;">85-87: A-</td><td style="padding: 5px;">58-62: C-</td></tr> <tr> <td style="padding: 5px;">82-85: B+</td><td style="padding: 5px;">58-50: D*</td></tr> <tr> <td style="padding: 5px;">82-72: B</td><td style="padding: 5px;">Less than 50: F</td></tr> <tr> <td style="padding: 5px;">72-70: B-</td><td></td></tr> </table> <p>*Note: If you earn a grade of D, that is the grade you will receive. Requests to change it to an F will not be honored.</p>	95 or higher: A+	68-70: C+	87-95: A	62-68: C	85-87: A-	58-62: C-	82-85: B+	58-50: D*	82-72: B	Less than 50: F	72-70: B-	
95 or higher: A+	68-70: C+												
87-95: A	62-68: C												
85-87: A-	58-62: C-												
82-85: B+	58-50: D*												
82-72: B	Less than 50: F												
72-70: B-													

Chem 2050 Assigned Reading

Below is the assigned reading and a corresponding set of homework problems. Your lecturer will give you guidance about where you are in the text and what to do to stay current with the reading. Read the material at least once before the lecture, and spend some time on the in-chapter problems to reinforce it. Unless noted otherwise, problems listed as Homework correspond to the end-of-chapter problems for the corresponding chapter. Answers to odd-numbered problems are at the end of the text. **If you are instructed to memorize something, the test will be written assuming you have done so.**

Homework is assigned but not graded. Quiz and examination questions will mostly be similar to those given in the text.

Gases	Chapter 9 , sections 9.1-9.5: Problems 5, 6, 7, 9, 13, 17, 27, 28, 29, 31, 33, 35, 37, 43, 45, 47, 49, 53, 55, 57, 59, 63, 65, 67, 71, 75, 78, 81, 85, 95
Quantum Mechanics, Atomic Structure, Periodic Properties	Chapter 6: Problems 3, 5(a), 7, 9, 10, 11, 18, 21(repeat for H), 22, 23, 27, 30, 35, 36, 37, 45, 49, 54, 55, 57, 58, 59, 61, 63, 64, 66, 67, 68, 69, 71, 76, 77, 79, 81, 83, 84
Chemical Bonding, Molecular Structure, Polarity	Chapter 7 , sections 7.1-7.4: Problems 3, 5, 7, 11, 13, 14, 15, 17, 20, 21, 23, 29, 31, 32, 35, 37, 39, 45, 47, 51, 55, 59, 63, 64, 65, 67, 77, 80, 81, 83 Chapter 7 , sections 7.5-7.6: Problems 91, 93, 97, 99, 105, 106
Intermolecular Forces, Phase Transitions, Phase Diagrams	Chapter 10 , sections 10.1 & 10.3-10.4: Problems 1, 3, 4, 5, 9, 10, 11, 12, 13, 18, 21, 31, 35, 37, 41, 43, 51, 53, 55, 57, 59, 61, 62, 63, 65, 69
Solutions	Chapter 11 , sections 11.1-11.4: 5, 6, 9, 10, 11, 18, 20, 21, 23, 28, 31, 33, 35, 37, 38, 45, 46, 47,

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<i>Colligative Properties</i>	48, 49, 50, 54, 55, 59, 61 Chapter 3 , section 3.4: 71, 73, 76
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LABORATORY EXPERIMENTS

Before coming to laboratory, read the scheduled experiment and any other material assigned. In many cases for the online course, you will also have to watch a video in preparation for the online laboratory session.

Scientific data requires special treatment. It must be recorded in non-erasable **ink** in your lab book immediately after a measurement is taken; partners cannot copy each other's data at a later time. **Altering or copying data outside of the laboratory represents academic dishonesty and will be prosecuted as such if observed.** Further, you will receive no credit for any lab report that includes data that are not your own. If your data are messy, you may copy them over onto a final report, but you must include your original data when you turn in your report. For the online course, you will probably be using a computer for logging data, but you should know that the original data must be kept unchanged. Do not underestimate the importance of keeping your original data undisturbed.)

Lab reports are due one week after you finished the experiment. All lab reports not handed in will receive a grade of zero. Late lab reports are penalized as follows: 10% off for 1 week or less lateness; 25% off for 2 weeks late; 35% off for 3 weeks late; 45% off for 4 weeks late, etc.

NOTE: If you have checked in for any lab course **you must check out** even if you only attend class for one or two weeks before dropping the course. Students who fail to check out will be charged a fee of **\$50** plus the cost missing or broken equipment. Students who drop a course must go to the stockroom to check out **as soon as possible**. (This is probably irrelevant for this online class.)

PREPARATION FOR LABORATORY

Your laboratory instructor is likely to give you an introductory speech about the laboratory that is supposed to be done on that day. Although this is an online course, and you may be tempted to do the laboratory work haphazardly, it is in your best interests to prepare for the laboratory session ahead of time. This includes reading about the experiment in your laboratory manual and watching any relevant videos. If you do this before your laboratory instructor begins their introductory speech, you will be well prepared for the actual laboratory exercise and will find the work much easier and understandable. Also note that if you continue your studies in science, your future laboratory sessions will not all be online, and in those cases it is imperative that you prepare for the laboratory assignment ahead of time.

Meeting

Laboratory Assignment

1

Introduction to Laboratory

Just some words about how the laboratory will be run.

2

Experiment 1: Density and Measurement

This shows how measurements of mass and volume produces density.

3

Experiment 2: Introduction to Gravimetric Analysis

A solid is heated, and the mass of water given off produces the waters of hydration.

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- 4 Experiment 3: Synthesis of Zinc Iodide

 *Zinc and iodine are combined to form zinc iodide, with the percentage of the
yeild calculated.*
- 5 Experiment 4: Basics of Chemical Reactions

 You are to watch videos and report on the reactions therein.
- 6 Experiment 5: Volumetric Analysis: Acid-Base Titration

 *You are to watch videos and report on the concentrations using the titration data
provided.*
- 7 Experiment 6: Introduction to Calorimetry.

 You are to watch videos and perform the calculations using the data provided.
- 8 Experiment 7: Evaluation of the Gas Law Constant

 You are to watch videos and perform the calculations using the data provided.
- 9 Experiment 8: Determining Atomic Emission by Spectroscopy

 You are to watch videos and perform the calculations using the data provided.
- 10 Experiment 9: Synthesis of Aspirin

 You are to watch videos and perform the calculations using the data provided.
- 11 Experiment 10: Spectrophotometric Analysis of Aspirin

 You are to watch videos and perform the calculations using the data provided.
- 12 Experiment 11: Intermolecular Forces and Physical Properties

 You are to watch videos and perform the calculations using the data provided.
- 13 Experiment 12: Determination of Molecular Weights by the Method of Freezing-
Point Depression

 You are to watch videos and perform the calculations using the data provided.
- 14 **(Nothing scheduled for this session.)**

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A description of the actual conduct of the course is below.

Preparation for Online Sessions

You are expected to prepare for the class before the time the class will be conducted online. At the very least, this means watching the videos and reading the material in the textbook that is expected to be covered in the next class session *before* the online class. Preparing for class also includes attempting the homework problems assigned for the upcoming lecture topic.

Internet Connection and Computer Hardware

All students are expected to have an internet connection that can be used to watch videos and to have an online video chat. The typical Smart phone or I-phone, even if it has all the capability required, is not recommended due to its small size and lack of complete compatibility. Most laptops are sufficient for the task, but make sure that you can use the camera and microphone on it.

You are all expected to keep your devices in good repair and with enough charge to last the class session. Do not expect “I didn’t hear you because my laptop lost its charge” or similar explanations to be a legitimate excuse.

Blackboard Requirement

All students are expected to be able to use Blackboard on at least a rudimentary level. Those who do not know how to do so must learn this within the first week. This includes reading Announcements, taking online tests, and participating in Blackboard Collaborate. All students are also expected to be able to find and watch videos on YouTube or other video sharing sites.

It is of critical importance to check the Blackboard Announcements frequently. That is the main way that information on the mechanics of the class will be disseminated.

Videos of Lectures

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This class is expected to watch certain videos available to replace actual lectures given. These videos are watched at the leisure of the student, and not at any specific time. Nevertheless, it is necessary for students to watch the lecture videos before the relevant online sessions of the class. This is part of the responsibility of the student to keep pace with the class, just as it is the responsibility of the student to study and do the relevant homework problems.

Links to these videos will be provided, usually using Blackboard. (It is likely that these videos will be available using my DropBox account, but this should not be of any concern to you.) If details on these videos are necessary, they will be found in the Announcements section of Blackboard.

On that note, it is imperative that all students pay attention to the Announcements found on Blackboard. Critical information (such as times of quizzes) will often be found there, so make sure that you read them often.

Because all the material of the lectures are online and available for you to benefit from at your convenience, you may be tempted to think that attending the online sessions is unimportant. That is unlikely, and in addition, not attending the online sessions is a bad idea for other reasons. This class should be treated with seriousness even though it is entirely online, and it should be remembered that the effort that you must extend in order to understand the concepts is not diminished even though you may not have to attend a physical classroom.

The Online Sessions: Direct Contact

The course was originally to have lectures in a physical classroom at specific times, and office hours at others. The online nature of the course requires several variations to suit the medium used. Unfortunately, due to the way the Chemistry Department has handled the courses this semester, there will not be enough time during the online sessions to produce live lectures that cover all the material that I want to cover at the depth that I want it to be taught. Whatever is not covered during the online sessions will be found in the textbook or the recorded videos that you are to watch. You are strongly advised to watch the lecture videos on the relevant topics *before* the online session begins. You will learn and remember much more that way.

1. The class that begins at 11:00 A.M. on Tuesday will commence with an online conference session where the student can join and listen to the instructor teach, if that is requested.
2. The online sessions will be conducted using Blackboard Collaborate.
3. Before the session, the students will find a link available for them to use in order to join the online session. Clicking on that link and following the simple instructions will enable the student to join the session and benefit from it.
 1. This link will usually be provided in the Announcements section of Blackboard. Students are expected to notice this link before the session begins.
4. The session might last for about the time of the lecture, but at least for one hour (unless all the students decide to reject the session). This session will not consist of an actual lecture (although it may evolve into that, pending student interactions), but of answering questions students have on the subject taught. If the students have no questions or requests, the session will be

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uneventful, but mostly useless. It is advisable for students to bring any questions they have to these sessions.

1. Students are reminded that they are to watch the videos of the lectures that are available to them before the class session. The class session is not for the lecture, which is in the videos, but for questions.
5. Once a week there will be the equivalent of an office hour. This will also be conducted online, and it will begin after the class session that is the first one of the week. For example, a class that meets on Tuesday at 11:00 A.M. And lasts until 12:30 P.M. will have this office hour time occur between 12:30 P.M. on Tuesday and continue until 1:30 P.M. on Tuesday.
6. Some times during the classes will be reserved for quizzes, of which we are planning on having 5. These will be strictly timed, so be prepared for them.
7. Some times will be reserved for testing, which will include the two remaining exams and the final. (Due to the online nature of the course, the time for the final may have to be changed.) More details on specific tests will be forthcoming as the course continues and different subjects are studied.

Quizzes, Tests, and Grading

There are two scheduled midterms and one final. The midterms will be done during the class time. Please begin the tests on time to ensure that you have enough time to complete the tests. The online system we will be using for administering the tests is unforgiving regarding tests that were started too late, or that were submitted past the deadline. Furthermore, there will be no makeups granted for midterms. (This is a departmental policy.)

As you may have seen above, these tests will account for 30% of your total grade. The final will account for 25% of your final grade.

Quizzes are also taken during class time, and the same considerations regarding timing will be in place. Quizzes will probably not take longer than 15 minutes, which means that beginning a quiz ten minutes late is going to be very damaging to your grade.

Four quizzes are required during this semester, and it is likely that I will actually administer 5 quizzes. If that is done, the lowest of the five quizzes will be dropped, and the grade calculated by only the four highest quiz grades.

Quizzes will account for 20% of your total grade.

All quizzes and tests will have to be taken online via Blackboard.

When the time comes for the quiz or test, you will find it on Blackboard. (More specific information would be given during the first online session.) You are to begin the quiz or test on time, because it will not be available after a certain time. Furthermore, these exams are strictly timed. There will be no makeups for them, so prepare your schedules for the quizzes and tests. Note that these computerized exams cannot accept any excuses or explanations and will simply grant you a grade of zero – and so will I.

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All of the above exams are to test the knowledge of the student, not the ability of the student to obtain information from elsewhere. Despite the online nature of the course, it is not permitted to accept or use help from other people, from websites, or from online search engines during the examinations. You should treat your test taking as similar to the test taking done in a classroom, with similar expectations of academic integrity.

As yet there is no practical solution to the problem of students receiving illegitimate assistance when taking online tests. But there are certain safeguards against violations of academic integrity that will be used during these tests that will, unfortunately, make test taking more difficult for you. This includes the inability to backtrack on questions that you have already attempted. This is done because students have already been caught using the online nature of these tests to cheat. As a result, you will unfairly suffer. (Feel free to blame them. And feel equally free to recognize that if you try the same, you are just as morally inferior.) The ease of violation of academic integrity is well known, and this is why any suspicion of illicit behavior will result in a punitive measures that will not be removed without convincing evidence. This does *not* mean that you can simply explain your behavior and get your grade reinstated. This means you will have to provide some form of proof that what you did could not have resulted in a form of cheating before your grade is reinstated. (That is obviously very difficult to do.) Please recognize this, and behave only in ways that your actions cannot possibly be construed as illegitimate.

It must be mentioned that it is the responsibility of the student to obtain a device that has a working internet connection as well as a camera and microphone, and that the student has what is necessary to take the tests without difficulties caused by technological failures.

Academic Integrity Statement

The following statement is required: “The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member **MUST** report the violation.”

You are all warned not to violate any of the academic integrity requirements. If I find a student who has violated any of these policies, the result will be severe. As this is a course in the practice of punishment

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for those who violate accepted rules, I will not countenance “I didn't know it was wrong” or “I thought it was okay to do” as an excuse.

Class Schedule

The following breaks down the subject matter into a meaningful schedule, but because the videos can be viewed at the students' discretion, the subjects can be learned with a different schedule. However, the class is expected to at least be up to the subjects in the following schedule. Furthermore, the schedule has the expected subjects for the online sessions, which will not deviate much from the schedule without an announcement to that effect.

Chapter 9: Gases and Gas Property Calculations

September 1

September 8

Chapter 6: Electronic and Atomic Structure, Chemical Periodicity

September 15

September 22

(There will be about 2 quizzes during those weeks.)

October 6: First Midterm

Chapter 7: Chemical Bonding and Lewis Structures

October 13

October 20

Chapter 10: Intermolecular Forces and Phase Changes

October 27

November 3

November 10

(There will be about 2 quizzes during those weeks.)

November 17: Second Midterm

Chapter 11: Solutions and Colligative Properties

November 24

December 1

(The remaining quizzes will be given during those weeks.)

December 8: Review

Final exams follow. The final exam covers the material of the entire term. Good luck!

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Academic dishonesty is prohibited in the City University of New York

Cheating, plagiarism, internet plagiarism and obtaining unfair advantages are violations of policies of academic integrity and are punishable by penalties, failing grades, suspension and expulsion.

It is true that this class will be given online, and the problem of online test security has not been completely solved. Nevertheless, you are warned ahead of time that for tests and quizzes, you are not permitted to receive any answers via internet search or other people. You are to work the problems and answer the questions *on your own*, without recourse to others.

For more information about CUNY policy on academic integrity see
<http://web.cuny.edu/academics/info-central/policies/academic-integrity.pdf>

Student Disability Services

In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell at 718-951-5538. If you have already registered with the Center for Student Disability Services please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Student Bereavement Policy

Students who experience the death of a loved one during the semester should consult the student bereavement policy here:

<http://www.brooklyn.cuny.edu/web/about/initiatives/policies/bereavement.php>

Non-Attendance Due to Religious Beliefs

Students who are unable to attend class due to religious observations should consult the Brooklyn College Undergraduate Bulletin for the college's policy, and contact the lecturer to discuss the issue. Students must come forward with the issue in a timely manner.

Lab Exemptions: If you are repeating the course you may be able to obtain a lab exemption by filing a lab exemption request form in the Chemistry Department office (359 NE). Students who receive lab exemptions **MUST attend recitation and take the recitation quizzes**. Lab exempt students may choose to retake the lab quizzes for a higher grade. Speak to your assigned lab instructor to arrange this.

To withdraw, you must withdraw using CUNYFirst (see below) and go to the stockroom to **CHECK OUT** from the laboratory. (Note: For this online course, you do not need to check out of anything.)

Note that first-semester freshmen (and SEEK, ESL, and Honors students) **MUST** get an adviser's permission in order to withdraw; advisers are available in the Center for Advisement and Student Success in Boylan.

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For information about how to withdraw using CUNYFirst and the effect of withdrawal on financial aid, see <http://www.brooklyn.cuny.edu/web/about/administration/enrollment/financial/faq/withdrawing.php>

Pass-Fail Option: Details regarding taking courses on a pass/fail basis are given in the Brooklyn College bulletin. Students interested in this option should read the bulletin carefully, as they may not be eligible to do so; questions should be directed to the Registrar. However, note that the last day to submit a request to take a course on a pass/fail basis is given in the calendar above.

Here are some important dates for this semester.

Wednesday, August 26	First day of Fall 2020 classes
Tuesday, September 1	Last day to add a course
Tuesday, September 29	Conversion Day –Classes follow a Monday Schedule
Wednesday, October 14	Conversion Day –Classes follow a Monday Schedule
Friday, November 6	Last day to withdraw from a course with a “W” grade

Note: The date for the withdrawal from class without penalty is an important one. You are expected to be continually abreast of your status in the course. By this time, you should have enough information as to whether this semester is the one in which you can succeed, and decide appropriately as to whether you continue with it or withdraw without penalty. Please do not “wake up” too late for you to realize that this semester is not the right time for you to take this course and succeed.

Wednesday, November 25	Conversion Day –Classes follow a Friday Schedule
Thursday, December 10	Reading Day
Friday, December 11	Reading Day
Monday, December 14	Final Examinations Begin
Sunday, December 20	Final Examinations End / End of Fall Semester

Chemistry Careers In and Out of the Laboratory

A degree in chemistry opens doors to dozens of exciting and rewarding careers. Here are just a few possibilities.

- *Get involved in product development, manufacturing, or quality control for companies producing anything from chemicals to pharmaceuticals to textiles.*
- *Go on to obtain a MS or PhD in chemistry, biochemistry, biotechnology, bioinformatics, pharmacology, or any other biomedical field, and take a leading role in medical research. Design and test new drugs and medical devices.*
- *Get involved in sales and marketing for chemical and pharmaceutical firms. Companies are always looking for people with a strong technical background to market their products, and will pay top dollar for them.*
- *Go into the field as an environmental chemist to study and protect the natural world.*
- *Use your skills in interesting and challenging ways, from evaluating risk for insurance firms to restoring artwork for museums.*
- *Work in law enforcement, in anything from forensic investigation to health and safety regulation. Or work inside the political process at a government agency to help formulate policy on scientific, medical and environmental issues.*
- *Pursue a career in patent law and help bring the next great scientific breakthrough to the market. Or work in the U.S. Patent and Trademark Office to insure that inventors' rights are protected.*

Salary Information

<i>Chemistry Degree</i>	<i>Median Starting Salary*</i>	<i>Median Base Salary (all chemists)**</i>
<i>BA or BS</i>	<i>\$39,600</i>	<i>\$77,000</i>
<i>MS</i>	<i>\$55,000</i>	<i>\$87,000</i>
<i>PhD</i>	<i>\$75,700</i>	<i>\$105,000</i>

**From Chemical and Engineering News, June 2, 2014, p.28.*

***From Chemical and Engineering News, November 9, 2015, p. 30.*

Chemists do sometimes have to change jobs or make career choices, but their skills are always in demand. In 2009, the U.S. unemployment rate peaked at 10.1%; the rate for chemists and chemical engineers that year was 3.9%. (see S. L. Rovner, Chemical and Engineering News, Nov. 7, p. 34, 2011). A skilled chemist is a valuable commodity.

Salaries for chemists are high, but do not do justice to the excitement of the field. Science as it is practiced today is collaborative, and chemists have abundant opportunities to travel, to work with interesting people, and to present the results of their work in ways that have a profound influence on the world. Science will shape the world of the 21st century, and you have the chance to be part of that process.

Medical School, the Chemistry Major, and You

Fiction #1: *Being a chemistry major will hurt my chances for medical school, because the hard courses may lead to a lower GPA.*

Fact: *Students majoring in mathematics and the physical sciences (this includes Chemistry) have the highest medical school acceptance rate of any major:*

Primary Undergraduate Major	Acceptance Rate
<i>Mathematics and Physical Sciences (including Chemistry)</i>	<i>46%</i>
<i>Biology and Health Sciences</i>	<i>40%</i>
<i>Humanities and Social Sciences</i>	<i>43%</i>
<i>Other</i>	<i>40%</i>

Based on data for the entering class of 2018, reported by the American Association of Medical Colleges
Table compiled from data available at <https://www.aamc.org/>

Fiction #2: *Chemists have to take a lot of hard courses so they don't have time to do volunteer work, research, and other activities that help with medical school applications.*

Fact: *A student who has completed his or her requirements for medical school can obtain a chemistry degree with as few as five additional courses. This leaves plenty of time for other activities.*

Fiction #3: *If I don't get into medical school, I may be stuck working in a lab all day.*

Fact: *Chemists have enormous opportunities outside the lab. Chemical and pharmaceutical companies desperately need managers and salespeople with chemical knowledge, and will pay top dollar for them. Chemists also find work in finance, insurance, law, government and manufacturing. Go to the American Chemical Society website on Careers (<https://www.acs.org/content/acs/en/careers.html>) and use the "College to Career" link.*

Some other advantages of being a chemistry major:

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- *Chemistry majors can receive credit for performing research work with a faculty mentor. This means the time you spend on research gets you closer to graduating and your research experience appears on your transcript.*
- *Chemistry majors get the skills they need to perform advanced laboratory work, so they can get better research positions, accomplish more and get stronger letters of recommendation from their mentors.*
- *Thanks to generous donations by alumni, the Department of Chemistry is able to give out more than \$10,000 every year in fellowships, scholarships and awards. These are an aid to both the pocketbook and the resumé.*
- *Brooklyn College's first Rhodes Scholar of the 21st Century was a Chemistry major.*