

PLACING YOURSELF IN CHEMISTRY

Student success in introductory chemistry depends primarily on two things, skills and commitment. The latter is up to you, but we can help you with the former. Because students enter college with varying problem solving skills from their high school experiences, different introductory chemistry sequences are offered at Brandeis University. The course for students with typical preparation is CHEM 11. It assumes successful math preparation through pre-calculus. CHEM 11 is taken by about 3/4 of the students in introductory chemistry. For students with stronger than usual preparation, we offer CHEM 15. This course has a more adventurous and challenging curriculum than typical backgrounds permit.

The final placement in these courses will be done in the fall, with the help of a brief diagnostic test given on the first day of class. Sample questions can be found below for your guidance. In the meantime, please adhere closely to the following steps for pre-enrollment:

1) Before registration:

Consider your previous experiences carefully and choose a chemistry lecture and laboratory course according to the guidelines below. Remember that your success this year will be best assured by an honest appraisal of the program that will best serve your needs and goals.

Also, be sure to review your other course options with a view to flexibility in the afternoons. The chemistry laboratory sections have limited enrollments and you will need to work your other classes around the availability of laboratory slots.

2) Registration:

a. Enroll in a chemistry lecture course, CHEM 11a or 15a. If enrolling in CHEM 11a, note that Section 2 meets in the same time block as CHEM 15a to allow flexibility in placement. The lecture course is a full course, worth four credits.

b. Enroll in the corresponding chemistry laboratory course, CHEM 18a for students in CHEM 11a, and CHEM 19a for students in CHEM 15a. Each week, a student attends a four-hour lab session and a one-hour lab lecture. The lectures for all sections of both laboratory courses are scheduled in the same time block to allow flexibility in placement. The laboratory course is a half course, worth two credits.

3) Completing registration:

Ask for confirmation of your registration. Do not simply accept the statement that your requested transactions have been completed. Check that you have been enrolled in a lecture course and in a laboratory course.

GUIDELINES:

a) If you are uncomfortable with math, then you should consider postponing introductory chemistry until you have successfully completed Math 5a, especially if you have not previously had a successful year of high school chemistry or physics. You may address questions about postponing introductory chemistry to Professor Epstein (epstein@brandeis.edu).

b) If you have had a successful year of high school chemistry and done well in AP chemistry** or AP physics or AP calculus, then you should enroll in CHEM 15a and the

associated laboratory CHEM 19a. Questions about enrolling in honors chemistry may be addressed to Professor Herzfeld (herzfeld@brandeis.edu).

c) If neither of the above situations applies to you, then you should enroll in CHEM 11a and the associated laboratory CHEM 18a, pending the results of the diagnostic test that will be given on the first day of class. If you are interested in the possibility of taking the honors course, you can facilitate this option by enrolling in Section 2 of CHEM 11a which meets at the same time as CHEM 15a.

** Students who scored 5 on the Chemistry AP test are encouraged to take Organic Chemistry, CHEM 25a, along with the CHEM 29a laboratory, if they choose to take a chemistry course in their first year. This choice allows more time in subsequent years to take advanced courses and carry out research. Students considering this option may wish to talk to the chemistry undergraduate advising head, Professor Foxman (foxman1@brandeis.edu). While students who received a 4 on the Chemistry AP test are also eligible to take CHEM 25a, past experience is that these students do poorly in CHEM 25a. Therefore, before enrolling in CHEM 25a, these students must discuss their placement with Professor Foxman (foxman1@brandeis.edu). Note, that students electing to take AP credit for first-year chemistry must begin their chemistry career at Brandeis University with CHEM 25a.

SAMPLE QUESTIONS FOR THE DIAGNOSTIC TEST

(to be completed without a calculator)

1. Evaluate $(0.04)^{1/2}$
2. If $2 + (4+x)^{1/2} = 10$, what is the value of x ?
3. Evaluate $(6 \times 10^{-6})(4 \times 10^{-4}) / (3 \times 10^{-3})$
4. How many moles of carbon are present in 6 moles of $\text{Al}_2(\text{C}_2\text{O}_4)_3$?
5. If $(V_2/V_1) = (M_1/M_2)^{1/2}$, what is the expression for M_2 in terms of the other three variables?
6. Suppose that $(1/V) = (A/B)(1/S) + (1/B)$, where V and S are variables and A and B are constants. If $(1/V)$ is plotted on the y-axis versus $(1/S)$ on the x-axis,
 - a. what is the expression for the y-intercept?
 - b. what is the expression for the x-intercept?
7. Evaluate $[\log(100) - \text{antilog}(2)]$
8. You are given 1 liter of 1 M glucose. You dilute it by adding to it 9 liters of distilled water. What is the final concentration?
9. Given that $1 \text{ cm}^3 = 1 \text{ mL}$, how many liters are there in a cubic meter?
10. If the atomic mass of Br is 80. g/mol, what mass of Br_2 is required to prepare 500. mL of 0.010 M aqueous Br_2 ?

11. If the density of a liquid is 0.80 g/mL, what is the volume of 2.4 grams of the liquid?
12. If 24 g of a compound synthesized in the laboratory represents a yield of 75%, what is the maximum (100%) yield?
13. If $x+y=2$ and $2x+4y=5$,
- what is the value of x ?
 - what is the value of y ?

Answers:

- 0.2
- 60
- 8×10^{-7}
- 36
- $M_1(V_1/V_2)^2$
- $1/B$
 - $-1/A$
- 98
- 0.1 M
- 10^3
- 0.80 g.
- 3.0 mL
- 32 g
- 1.5
 - 0.5