

# Planning for a Chemistry Major

The Department is excited that you find the intellectual challenges of chemistry rewarding and looks forward to helping you design a major plan that fits your academic circumstances. In the past, some students have asserted that, although they were attracted to the major, they had significant reservations, largely arising from a misperception that there is very little flexibility in planning a major. The prevailing impression appears to be that any of the major options (Plan A, Plan B, or Biophysical) requires a student to take two major courses in one or more terms. In order to better inform your decision, we have prepared this handout to show you various tracks that you might take through the Chemistry major; not only does this emphasize that the major is more flexible than it might appear at first glance, but also it shows that there are several major plans that do not require taking two major courses in a term.

So, to many of you who may be asking the question, “*Do I have to double up Chemistry classes if I am a major?*”, the answer is: “No!” See below for various options.

If, at any time, you have any questions about planning for a major in Chemistry, please do not hesitate to contact one of the members of the Chemistry Department’s Undergraduate Advisory Committee. Any member of this committee, or indeed, any member of the Chemistry faculty will gladly answer questions you might have about scheduling prerequisite courses, choosing major courses, and undergraduate research opportunities.

## Things to think about:

*Introductory Chemistry:* Students considering a Chemistry Department major are strongly encouraged to take Chemistry 5-6 (or 10) in their first year.

*Physics:* Students with advanced placement in English, foreign language, or chemistry are urged to consider taking Physics 13-14 during the first year. As a general guideline, it is recommended that physics be completed by the end of the sophomore spring term. Specifically, majors must complete Physics 13 (or 15, or 3 and 4) before they take Chemistry 75.

*Mathematics:* As a general guideline, it is recommended that the mathematics prerequisites be completed by the end of the sophomore spring term. Specifically, majors must complete Mathematics 8 before they take Chemistry 75.

*Residence Pattern:* Chemistry majors will have a much simpler time in terms of scheduling if they are on campus in winter and spring terms of their junior year.

## Some Possible Paths through the Chemistry Major

All Chemistry major tracks require at least 8 major courses, together with a culminating experience. (For all the options described below, the culmination requirement could be satisfied by participating in Undergraduate Research)

### Some options that do NOT require taking two major courses in a term

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58	41	63
Three		64	(90) or (92)	
Four	(91) or (93)	75	76	

Suitable for the Plan B major. Only one of the four courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course option is 63, 64, and one of 90, 91, 92, and 93.

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58	41	63
Three		75	76	
Four	(96.x) or (93) or (42)	64	(90) or (92)	

Suitable for Plan A or Plan B. Only one of the five courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 63, 64, and one of 90, 92, and 93, or 75, 76, 96.x, or 75, 76, 42.

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58	41	63
Three		75		
Four	93	64	76	

Suitable for Plan B. The culminating experience course option is 63, 64, and 93.

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58		63
Three		75	41	
Four	93	64	76	

Suitable for Plan B. The culminating experience course option is 63, 64, and 93.

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58		63
Three		75	76	
Four	(93) or (96.x)	64	41	

Suitable for Plan A or Plan B. Only one of the two courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 63, 64, and 93, or 75, 76, 96.x.

### Some options that require taking two major courses in just ONE term

Year/Term	Fall	Winter	Spring	Summer
Two			51	52, 63
Three		75	76	
Four	(93) or (96.x)	64	(41) (90)	

Suitable for Plan A or Plan B. Two of the four courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 63, 64, and one of 90, 93, or 75, 76, 96.x.

Year/Term	Fall	Winter	Spring	Summer
Two			51	52, 63
Three		64	41	
Four	(91) or (93)	75	76	

Suitable for Plan B. One of the two courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 63, 64, and one of 91, 93.

Year/Term	Fall	Winter	Spring	Summer
Two			51	52
Three		75	76, 41	
Four	(93) or (96.x) or (42)	64	(90) or (92)	

Suitable for Plan A or Plan B. Two of the five courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 75, 76, 96.x, or 75, 76, 42.

Year/Term	Fall	Winter	Spring	Summer
Two			51	52
Three		64	41, (90)	
Four	(87) or (91) or (93)	75	76 and (87) or (90) or (92)	

Chemistry 87 and one of the other four courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course option is 87.

### Some options for our Biophysical Chemistry major

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58	41	(63)
Three		64 and 75	76 (90) or (92)	
Four	(42) or (91) or (93) or (96.x)	67		

One of the seven courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 75, 76, 96.x, or 75, 76, and 42 or 67, or 63, 64, and one of 90, 91, 92, 93.

Year/Term	Fall	Winter	Spring	Summer
Two	51 or 57	52 or 58		(63)
Three		64 and 75	41 and 76	
Four	(42) or (91) or (93) or (96.x)	67	(90) or (92)	

One of the seven courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 75, 76, 96.x, or 75, 76, and 42 or 67, or 63, 64, and one of 90, 91, 92, 93.

Year/Term	Fall	Winter	Spring	Summer
Two			51	52
Three		64 and 75	41 and 76	
Four	(42) or (91) or (93) or (96.x)	67	(90) or (92)	

One of the six courses shown in parentheses would be required for the minimum of 8 courses. The culminating experience course options are 75, 76, 96.x, or 75, 76, and 42 or 67.

Of course, other arrangements are possible, and the UAC is always available to help you find the path best suited for you.

## **Chemistry Major Tracks -- Details**

### **PLAN A MAJOR**

Prerequisite: Chemistry 5-6 (or 10); Mathematics 3, 8, and 13 (or equivalents); and Physics 13-14 (strongly recommended) or 3-4 or 15-16.

Required Courses: Chemistry 51 or 57, 52 or 58, 64, 75, 76 and 96. Two additional courses selected from among Chemistry 41, 42, 63, 67, 68, 87, 90, 91, 92, 93 and 96; graduate-level courses in Chemistry; Physics 19; Biology 40; Mathematics 20, 22 or 24, 23, and 46; and, with prior written permission, relevant major credit (or graduate-level) courses in other departments in the Division of the Sciences. Chemistry 41 cannot be taken in conjunction with Biology 40.

### **PLAN B MAJOR**

Prerequisite: Chemistry 5-6 (or 10); Mathematics 3 and 8 (or equivalent); and Physics 13-14 (strongly recommended) or 3-4 or 15-16.

Required Courses: Of the eight courses, a minimum of six must be in chemistry to include a) Chemistry 51 or 57, 75 and 76, and 64; b) two additional courses from the following group: Chemistry 41, 42, 52 or 58, 63, 67, 68, 87, 90, 91, 92, 93, 96 and graduate-level courses in chemistry. Note that Chemistry 76 is a prerequisite to Chemistry 96. The remaining two courses may be additional chemistry courses from group b) above or may be chosen from the following: Physics 19; Biology 40; Mathematics 20, 22 or 24, 23 and 46; and, with prior written permission, relevant major credit (or graduate-level) courses in other departments in the Division of the Sciences. Chemistry 41 cannot be taken in conjunction with Biology 40.

### **BIOPHYSICAL CHEMISTRY MAJOR**

Prerequisite: Chemistry 5-6 (or 10); Mathematics 3 and 8 (or equivalent); Physics 13-14 (strongly recommended) or 3-4 or 15-16. (Biology 12 and 13 are recommended but not required.)

Required Courses: Chemistry 41, 51 or 57, 52 or 58, 75, 76, 64, and 67.

One additional course selected from among Chemistry 42, 63, 68, 87, 90, 91, 92, 93 or 96; graduate-level courses in chemistry; Engineering Sciences 35; Mathematics 20, 22 or 24, 23, or 46; Physics 19; and with prior written permission, relevant major credit (or graduate-level) courses in other departments in the Division of the Sciences.

### **REQUIREMENTS FOR THE CHEMISTRY MINOR**

The Chemistry Department offers a single minor program. Any student wishing to enroll in the minor program must submit a minor card signed by a member of the Chemistry Department's Undergraduate Advisory Committee no later than the day before final examinations begin in fall term of senior year.

Prerequisite: Chemistry 5-6 (or 10) and Mathematics 3

Required Courses: Chemistry 51 or 57 and 64. Two additional courses selected from among Chemistry 41, 42, 52 or 58, 63, 68, 75, 76, 87, 90, 91, 92, and 93; or graduate-level courses in chemistry. The NRO option is disallowed for any required course taken to fulfill the chemistry minor. Students should note that many of the courses listed above have prerequisites in addition to Chemistry 6 and Mathematics 3.