

Pre-Health Professions (Dentistry, Medicine, Optometry, Pharmacy, Veterinary Medicine)

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1. General considerations

The Pre-Health Professions A.S. is a program in the Math and Science Division for students pursuing careers in dentistry, medicine, optometry, pharmacy, or veterinary medicine, all of which will require transfer to a four-year school upon completion of the A.S. and further post-graduate study. **This program should not be confused with our separate Veterinary Technology program or with programs in allied health fields that are directed by the Health Sciences Division.**

VERY IMPORTANT: The Pre-Health Professions A.S. includes options for math courses and three options for sequences of science courses in the “area of emphasis requirements.” Students do not choose these options based on their personal preferences as they might with electives. They must choose these options based on their future plans and the requirements of their future educational institutions. **Your duty as an advisor is NOT to choose classes that will merely satisfy the degree program at Vol State, but instead you must help students correctly choose classes that will also satisfy the requirements of their future four-year schools and graduate programs.** This document is intended to help you navigate those decisions, but if you ever have questions about this, please contact the science chair, assistant dean, or dean of the Math and Science Division.

When advising a student for their first semester, it is unlikely that they will have already researched their potential future schools and know what requisite classes they will need for them. That’s perfectly fine. Just explain everything to the student and get them

thinking about their future direction so they can do that research for future semesters. Usually, for the first semester, students should take (1) all needed learning support (2) the highest math class they can take on the algebra sequence (see below), and (3) CHEM 1110 (or a prerequisite for CHEM 1110 if required). If a student does not (or can not) take all three of these in the first semester, it will likely delay their graduation.

Based on the requirements of most four-year and graduate programs, most students who complete the Pre-Health Professions A.S. will need to take MATH 1910, a sequence of biology courses, and a sequence of organic chemistry courses. (See sections 2 and 3.) These students should consider our Biology A.S. program. (See part 6.)

2. Math considerations

In general, students in the pre-health professions program should start math classes in their first semester and will very likely need to take MATH 1910.

Most students pursuing the Pre-Health Professions A.S. should take MATH 1910, not MATH 1830. MATH 1830 is an applied calculus class intended for business majors and is NOT equivalent to nor an acceptable substitute for MATH 1910. Most programs that pre-health professions students will enter after Vol State require MATH 1910 (or an equivalent calculus class) and will NOT accept MATH 1830. The only programs we are aware of that accept MATH 1830 are some, but not all, pharmacy programs. So, in general, advise a pre-health student to take MATH 1910, but not MATH 1830, unless you are absolutely certain that MATH 1830 will actually satisfy the student's long-term goals (which is unlikely). **Rule of thumb: do not put pre-health professions students in MATH 1830.** It is likely that the four-year school they transfer to and/or their future post-graduate program will require MATH 1910.

It is very important to make sure that a student who will take MATH 1910 begins the “algebra sequence” of math courses early (first semester); otherwise, their graduation may be delayed. The “algebra sequence” refers to a sequence of math prerequisite courses leading up to MATH 1910:

MATH 1005 → MATH 1710 → MATH 1720 → MATH 1910

(Alternatively, students may take MATH 1730 instead of MATH 1710 and MATH 1720, but this is advisable only for students with a very strong math background who are prepared for a very challenging class; **most students who must take these prerequisite classes should take the 1710/1720 sequence instead of 1730.**)

Students should be placed in the highest math class in this sequence for which they meet the prerequisites (see table below). The prerequisites are based on ACT scores AND their high school math background. (Yes, you must check that the student took the appropriate classes in high school.)

Class		Prerequisite
MATH 1005	Algebra Essentials	ACT Math subscore of 19 (or equivalent), or completion of Learning Support Competencies 1-5 , or concurrent registration in MATH 0105
MATH 1710	Precalculus Algebra	ACT Math subscore of 19 or equivalent, or completion of MATH 1005 with a grade of B or higher.
MATH 1720	Precalculus Trigonometry	Either MATH 1710 with a grade of C or higher, completion of MATH 1130 with a grade of A, or four years of high school mathematics including Algebra II and an ACT Math subscore of 23 (or equivalent)
MATH 1730	Precalculus	ACT MATH subscore of 21 or equivalent, or completion of MATH 1005 with a grade of B or higher, or completion of MATH 1130 with a grade of C or higher or MATH 1710 with a grade of C or higher.
MATH 1910	Calculus I	Four years of high school mathematics, including trigonometry, and an ACT math subscore of 25 or greater or MATH 1720 or MATH 1730 (either with a grade of C or higher)

If a student who will take MATH 1910 needs learning support for math (ACT<19), they MUST take MATH 1005 and MATH 0105 in their first semester in order to graduate in four semesters.

If students who need MATH 1910 begin with MATH 1010, MATH 1530, or other MATH courses not in this sequence, it will likely delay their graduation.

Likewise, MATH 1830 has a prerequisite of “Either MATH 1130, MATH 1710, MATH 1730 (all with a grade of C or higher) or four years of high school mathematics including Algebra II and an ACT Math subscore of 23 (or equivalent).” Therefore, the same considerations regarding the prerequisites for MATH 1910 also apply to MATH 1830.

It is NOT advisable for a student to take MATH 1130 to enter the algebra sequence. MATH 1130 is not really a part of this sequence, and its curriculum is not intended to help a student move along this path. References to MATH 1130 in prerequisites for the algebra sequence are only there to allow a pathway for students who happen to have already taken it, perhaps because they switched majors and took it in pursuit of the old major.

It is very important for pre-health professions students to begin their math classes immediately because many science classes also have math prerequisites. (See section 4.)

3. Science course options (Area of Emphasis Requirements)

The pre-Health Professions A.S. requires that students must complete **two** out of the following three sequences of science courses:

Sequence 1: **General Biology I & II (BIOL 1110 and BIOL 1120)**

Sequence 2: **Organic Chemistry I & II (CHEM 2010 and CHEM 2020)***

Sequence 3: **Non-Calculus Physics I & II (PHYS 2010 & PHYS 2020)**

***Note that sequence 2 has a prerequisite of CHEM 1110 and CHEM 1120 and thus requires four sequential semesters of chemistry classes.**

Students do not choose which two sequences they will take based on their personal preferences as they might with electives. They must choose these options based on their future plans and the requirements of their future educational institutions. **Your duty as an advisor is NOT to choose classes that will merely satisfy the degree program at Vol State, but instead you must help students correctly choose classes that will also satisfy the requirements of their future four-year schools and graduate programs. You must discuss with your advisee which four-year schools and graduate programs they are interested in and which of the above sequences will fulfill the requirements of their future four-year program and their future post-graduate program.**

Most students will need to take the biology and chemistry sequences (Sequences 1 & 2). Very few four-year and graduate programs will prefer students to take the physics sequence. **However, you should not make any assumptions. Help advisees identify their future programs and determine which sequences they need on an individual basis.**

Students taking the chemistry sequence must take CHEM 1110 as early as possible, preferably in their first semester if they meet the math prerequisites. The organic chemistry sequence requires prior completion of both CHEM 1110 and CHEM 1120, as well as math prerequisites, so it is a minimum four-semester sequence.

Likewise, students taking the physics sequence must complete the math prerequisites (MATH 1720 or MATH 1730 with a grade of C or higher) as soon as possible.

CHEM 1110 and CHEM 1120 are required for all students in the pre-health professions program and are counted toward fulfilling general education.

Many students are apprehensive about taking multiple science courses and/or both a science and math course in the same semester. However, this is unavoidable unless the student is willing to extend their graduation time by several semesters. For most students (those who will take the organic chemistry sequence), it is important to begin both the math and chemistry sequences in the first semester.

Students who will complete MATH 1910, the biology sequence, and the organic chemistry sequence should consider changing their program to the Biology A.S. (see section 6.)

4. Math prerequisites for science classes

Many science courses (particularly chemistry and physics) have math prerequisites. **Therefore, it is very important to make sure students are on track to complete their prerequisite math courses as early as possible, so they are not delayed in beginning their sequence of science courses.**

For example, General Chemistry I (CHEM 1110) has a prerequisite of an ACT math subscore of 19 or higher or completion with a grade of C or higher or concurrent enrollment in MATH 1710 or higher. So, if a student with ACT<19 needs to take CHEM 1110, they must have already completed MATH 1005 and MATH 0105 before they can concurrently enroll in CHEM 1110 and MATH 1710. It is therefore very important that such a student take MATH 1005 and MATH 0105 in their first semester. Otherwise, entry into their chemistry sequence would be unnecessarily delayed.

Be sure to check the math prerequisites for all science classes to ensure students will take the appropriate math classes, and make sure they begin them as early as possible (first semester).

5. General education requirements

CHEM 1110, CHEM 1120, and calculus are required for all students in the pre-health professions program and are counted toward fulfilling general education requirements.

Other general education requirements are below:

- COMM 2025 - Fundamentals of Communication, 3 credits
or COMM 2045 - Public Speaking, 3 credits
- ENGL 1010 - English Composition I, 3 credits
- ENGL 1020 - English Composition II, 3 credits
- Three classes in Humanities and/or Fine Arts (Must include at least one Literature Course), 9 credits
- Two classes in History, 6 credits
- Two classes in Social/Behavioral Sciences, 6 credits

6. Consider switching to Biology A.S.

Based on the requirements of their future four-year programs, most students who complete the Pre-Health Professions A.S. will need to take MATH 1910, the biology sequence, and the organic chemistry sequence (see above). These classes are also the requirements to complete the Biology A.S. program. Students who take these classes may find it beneficial to change their major to the Biology A.S. simply because holding a degree without “Pre-” in its title holds a bit more clout in the public eye.

7. What if a student is having trouble completing all the required classes in two years?

Some students may not be able complete all of the required math and/or science classes (particularly if they need the organic chemistry sequence) within two years, especially if learning support in math is required. In addition to just taking a few extra semesters to complete the program, these students have a few other options to continue on to a four-year school, listed below. **Students should be advised that if they choose not to complete the Pre-Health Professions A.S. (or Biology A.S.) that they would very likely still have to complete any remaining classes after transferring to their four-year school, and probably at a higher cost.**

1. Switch to the Mathematics and Science A.S.

The mathematics and Science A.S is a University Parallel program similar to the General Studies A.S., except is has a focus in math and science courses. Students who have completed MATH 1710 or higher and a total of at least 19 credits in math and natural science courses may satisfy the requirements of this program. Please

see the catalog for more information and to confirm that any interested student can meet all the requirements.

2. Switch to the General Studies A.S.

Please see the catalog for more information and to confirm that any interested student can meet all the requirements.

3. Transfer to their four-year school without completing an A.S.

It will probably be more expensive to complete any remaining classes at a four-year school than it would to complete them here.