A Guide for
First and Second Year
Students Interested in
The Health Professions
2017-2018

www.brynmawr.edu/healthpro

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Chapter 1: Introduction to the Health Professions Advising Office

Bryn Mawr is a wonderful setting to prepare for a career in the health professions. Medical schools, dental schools, schools of veterinary medicine, schools of public health and programs in other health professions favor students who have pursued a challenging, rigorous curriculum as undergraduates. None of the schools requires applicants to major in a science; all seek students who are mature, motivated, curious, and hardworking and who have a demonstrated commitment to service in addition to a strong foundation in science. Applicants with a broad, liberal arts education are at an advantage in the admissions process.

The Health Professions Advising Office provides information and assistance to students and alumnae who are interested in careers in any of the health professions. We work with you throughout your Bryn Mawr career and beyond as you pursue academic, community service, and professional opportunities, and we will advise you throughout the application process to professional schools. Our office organizes many events, workshops, and meetings with admissions representatives and health professionals to help you learn about these fields. We also work closely with the leaders of several student-run organizations that sponsor sessions, meetings, and service projects related to health.

There is no formal prehealth major or academic track at Bryn Mawr. With careful academic planning, you can major in any field of study, complete the prehealth requirements, and pursue other academic goals, such as study abroad. Although most prehealth students gravitate to natural science majors, many prehealth students have majored in such fields as anthropology, English, French, history, political science, and psychology before embarking on successful health careers. The fundamentals of a Bryn Mawr College education - learning through conversation and collaboration, primary reading, original research and experimentation - provide an excellent foundation for a health professions career.

We are excited to begin working with you now to help you explore and prepare for a career in the health professions. We encourage you to read through this Guide for First and Second Year Students to gain additional resources. Please get to know the HPAO and join us in working with you to create a plan that would fit well for your situation.

Health Professions Advising Office
www.brynmawr.edu/healthpro
Canwyll House East
Telephone: 610-526-7350
The Health Professions Advising Office is open year-round from 9:00 a.m. to 5:00 p.m., Monday -Friday.

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Dean Glicksman is eager to talk with students about their interest in exploring any of the health professions. She is available for individual appointments throughout the year; call the Health Professions Advising Office to schedule a meeting. During busy times, at the beginning at end of the semester, she has open office hours. Visit www.brynmawr.edu/healthpro for the current schedule.

Note that Dean Cummings works primarily with students in our Postbaccalaureate, Premedical Program, but is also available to assist undergraduates.

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The Health Professions Advising Office (HPAO) Website: This site provides information about the application processes to medical, dental, and veterinary school as well as links to health professions organizations and sites of special interest. There are sections about volunteer opportunities, financing professional school, and prehealth student organizations. We have a password-protected site with additional resources that are specific to Bryn Mawr. Visit www.brynmawr.edu/healthpro

The Prehealth Listserv: Be sure to join the Prehealth Listserv, through which HPAO sends useful information, including announcements about special events on campus, research and internship opportunities, application deadlines, etc. To subscribe to the Prehealth Listserv (and other Bryn Mawr college listservs) go to the website: http://newmailman.brynmawr.edu/mailman/listinfo. Choose the subscription page, scroll down to and select Prehealth-l. Complete the subscription form using your Bryn Mawr email address and your full name. After you confirm your subscription, your request will be sent to the listserv moderator for final approval. You can unsubscribe from the Prehealth Listserv at any time by logging into the subscription page, where you can complete the appropriate form.

Health Professions Resource Room: The Health Professions Advising Office (HPAO), located in Canwyll House East, has a variety of helpful resources including books about the admissions processes for medical, dental, veterinary and other health professions schools, a binder with admission statistics for Bryn Mawr applicants, and review books for the Medical College Admissions Test (MCAT) and Dental Admission Test (DAT). Some of these materials are available for overnight or weekend loans. In addition, we have a subscription to the Medical School Admission Requirements, published by the Association of American Medical Colleges. You can access it online in our resource room.

Health Professions Reserve Shelf, Collier Library: Additional copies of review materials to prepare for the MCAT and DAT are also available on the Prehealth Reserve Shelf in Collier Library. These items are for use only in the library.

Workshops, Panels, Speakers, Health Interest Groups: The Health Professions Advising Office (HPAO) sponsors a variety of informative workshops and panels throughout the year. The office also supports Health Interest Programming, which are student-organized sessions focusing on specific topics in health care. (See Appendix B Prehealth Student Organizations)

Important Information for International Students

While admission to medical, dental, and veterinary school can be challenging for even the most highly qualified students, international students who are not U.S. permanent residents face additional challenges. It is extremely difficult for a non-U.S. citizen who is not a permanent resident to secure a place in medical, dental or veterinary school as well as many other health professional schools. For admissions purposes most health professions schools do not differentiate between U.S. citizens and non-citizens who are permanent residents. Many medical, dental and veterinary schools will not accept applications from non-U.S. citizens. Please consult the Health Professions Advisor to discuss your specific situation and to learn resources to research school admissions policies.

In recent years, only 1% of the 19,000 students entering medical school nationally were non-U.S. citizens. Information about which U.S. medical schools accept international students can be found in Medical School Admissions Requirements (https://students-residents.aamc.org/applying-medical-school/article/applying-international-applicant/).

The small percentage of medical schools that consider applications without reference to citizenship typically require accepted international students to pay their tuition up front; sometimes requiring as much as four years’ tuition to be paid in advance of starting medical school. The cost of a four-year medical education ranges from $150,000 - $250,000. Because non-U.S. citizens are not eligible for U.S. government loans and other U.S. government-sponsored financial aid, the “up-front payment” requirement can make it very difficult for an international student to pay for medical school - even if she is accepted.
Chapter 2: Preparing for Medical School

INTRODUCTION

Students interested in medicine should realize that medical schools are seeking candidates who have gained skills and competencies to serve as an effective physician. (See Appendix D for the Core Competencies listed by the Association of American Medical Colleges.) To develop these competencies, students must gain academic preparation through coursework, engage in experiential learning in health-related settings, and contribute to community service. For all students, that means gaining clinical experience. For many students, that also means engaging in research. That is especially true for those seeking research-rich medical careers.

Academic Preparation: You may be surprised to learn that you can major in any field and go to medical school. Medical schools value liberal arts education as a way to develop strong critical thinking and communication skills as well as intellectual curiosity and cultural awareness.

There is no major that would be “best” for all premedical students. Although interest and facility in the natural sciences are essential for success in medicine, many students prepare for medical school and gain a firm foundation in the natural sciences while pursuing a major in the social sciences or humanities. Ultimately, you should major in a subject that captures your intellectual passion. You could also consider combining a major with a minor in a different discipline.

Because there is no premedical track at Bryn Mawr, students have the autonomy to develop their own academic plans in consultation with their dean, faculty advisors, and the prehealth advisor. You should consider your academic goals and explore the robust academic opportunities at Bryn Mawr and in the Tri-Co and Quaker Consortium. If your goals include spending a semester abroad, it is important to meet with the prehealth advisor early in your college career to discuss possible academic plans.

BACKGROUND ON RECENT CHANGES TO MEDICAL AND PREMEDICAL EDUCATION

This is an exciting time to be entering the medical profession. Advances in technology and a growing emphasis on public health issues have fostered greater scrutiny of how students prepare for the field. Over the past few years, the Association of American Medical Colleges (AAMC) and the Howard Hughes Medical Institute (HHMI) have been reviewing medical school and premedical education to provide a conceptual and skill-based framework for lifelong learning and medical practice.

In 2009 the AAMC and HHMI released "Scientific Foundations for Future Physicians (SFFP)," a report that recommended innovative approaches to premedical education and outlined a set of scientific competencies and quantitative skills that should be mastered by premedical students. (Please see Appendix D and consider this list as you make decisions about academic and co-curricular experiences.) AAMC also published, “Behavioral and Social Science Foundations for Future Physicians,” arguing that it is essential for physicians to gain a conceptual framework in the socioeconomic and cultural determinates of health in order to understand these issues and to address health care disparities. Concurrently the AAMC conducted a review of the Medical College Admission Test (MCAT) - the standardized test that all students must take in order to apply to medical school. As a result of these studies, significant changes in content coverage and format to the MCAT were implemented during 2015.

Your undergraduate career is an important preparation in many ways. At the most basic level, you will be meeting medical schools' specific course requirements and working to master material that you will be tested on via the MCAT; however, you will be doing much more than that. You will be developing critical thinking and other academic skills that will lead to your success in medical school and gaining extensive exposure to ideas and experiences that will infuse your life as a medical professional. Further, you will be gaining important intrapersonal and interpersonal competencies through engagement in extra-curricular activities on campus and in the community.
WHAT DO THESE CHANGES MEAN FOR ME AS A MEMBER OF THE CLASS OF 2021?

You will be preparing for medical school during a time of evolution in the premedical requirements. Although some schools have modified their prerequisites in response to the reports on medical education and the resulting changes in the MCAT implemented in 2015, it is possible that there will be some additional changes. We recognize that there will be some uncertainty moving forward, but a plan to take the traditional course requirements for medical school admission will be a productive way to begin your college career. We play close attention to medical education literature and would alert students to any changes. Typically, changes are implemented with a grace period. Stay in touch with the prehealth advisor and your dean who can provide advice and support in choosing classes while you explore careers in medicine.

REQUIRED PREMEDICAL COURSES VS. COMPETENCY-BASED APPROACH TO MEDICAL SCHOOL ADMISSIONS: WHAT DOES THIS MEAN?

AAMC has been developing a competency-based approach to premedical and medical education. The AAMC defines a competency as “an observable behavior that combines knowledge, skills, values and attitude related to a specific activity.” It would be helpful to consider these competencies as you prepare for your medical school applications as well as your interviews. For more information, please review the final appendix of this guide.

Historically medical schools have required that students complete a specific set of courses, often referred to as the “core” or “traditional” premedical requirements prior to applying to medical school. Recently some medical schools have been changing their approach. Instead of specifying course requirements, they are outlining “competencies” — conceptual content areas of knowledge in the natural and social sciences and the humanities as well as quantitative reasoning skills that students must demonstrate mastery of prior to application. Some of the schools using competency-based approaches provide suggested course lists. Many of these closely parallel the “traditional” premedical course requirements.

WHAT COURSES ARE RECOMMENDED TO BE PREPARED FOR THE MCAT AND FOR ADMISSION TO MEDICAL SCHOOL?

Currently for most medical schools, by the time you apply you must have completed the following courses:

- **ONE YEAR OF BIOLOGY WITH LAB**
- **ONE YEAR OF GENERAL CHEMISTRY WITH LAB**
- **ONE YEAR OF ORGANIC CHEMISTRY WITH LAB**
- **ONE SEMESTER OF BIOLOGICAL CHEMISTRY** (Please note that some schools now require a semester of Biochemistry. Even for schools that do not require biochemistry as an admission requirement, it would enable students to gain the analytical skills that would be key to success on the MCAT. Please see below for the specific course information.)
- **ONE YEAR OF PHYSICS WITH LAB**
- **ONE YEAR OF ENGLISH** (One semester of the Emily Balch Seminar plus one additional writing intensive course that can be completed at any time prior to graduation. Some students take the Balch Seminar plus an additional writing course in the English Department. Some students ask if they can take a writing-intensive course offered in a humanities or social sciences discipline. If you do so, you should keep copies of the course description and syllabus and of all written materials because medical schools might question whether the course was “writing intensive.” Please note that typically medical schools will accept neither a thesis course as writing intensive, nor a writing intensive course within a natural or physical science discipline.)

The MCAT implemented in 2015 added an interdisciplinary section that covers topics from psychology, sociology, and the biological basis of behavior. Although some medical schools already require coursework in behavioral science, other medical schools have been adding a required course in psychology, sociology, or behavioral science. Many Bryn Mawr students who have taken the MCAT indicate that an introductory course in psychology enabled them to become familiar with the concepts on
this section. It is important to meet with the prehealth advisor each semester prior to course preregistration to discuss your curricular plans in the context of evolving changes in premedical course requirements.

We have prepared samples of course plans showing how other Bryn Mawr students have sequenced their prehealth requirements with their major requirements and their College-wide Requirements. Visit the HPAO website to review these samples. www.brynmawr.edu/healthpro

ADDITIONAL PREMEDICAL COURSE REQUIREMENTS AND SPECIAL SITUATIONS

Note that many medical schools require additional science and math courses. For example, as indicated above, a number of medical schools require or strongly recommend a course in biochemistry (see section below, “More About Changes in the MCAT.”). Although only a small percentage require statistics, almost all medical schools believe that having knowledge of basic statistical principles is essential for evaluating scientific studies.

Science: Many medical schools require or strongly recommend one or two additional upper-level science courses. A listing of these schools and their requirements can be accessed at the Health Professions Advising Office website (http://www.brynmawr.edu/healthpro/info/advanced.html). We advise non-science major premedical students to take 1-2 upper-level biology courses in addition to the core premedical science requirements, and one of those courses should be biochemistry. Genetics would be an additional possibility. Review the course information and consult your advisor and the instructor for help in assessing your preparation for specific courses.

If you plan to take a Biochemistry course, please check the course information and consult with the department. At Bryn Mawr, students majoring in Biology or in Biochemistry, should take BIOL B375. Integrated Biochemistry and Molecular Biology I. Only one semester is required for medical school but if appropriate for the student’s plan as a Biology major, then the student should also take BIOL B 276 Integrated Biochemistry and Molecular Biology II. Those majoring in fields other than Biology or Biochemistry, should take the one-semester course CHEM B242 Biological Chemistry, which is a lecture course. Note that BIOL B275 and B376 include both lecture and laboratory.

AP/IB credits in the sciences: Because medical schools want to see that you can handle college-level science and laboratory work, at a minimum you should take as many college-level science courses as are listed in the premedical requirements. If you have AP/IB credits, this often means that you may take upper-level science courses instead of introductory courses, but sometimes the science departments will still recommend that students take the Bryn Mawr introductory science courses. If you have AP/IB credit in science, speak to your dean and to the prehealth advisor about the best course choices for your individual situation.

Math and statistics: The math requirements vary from medical school to medical school. Some schools do not require any math classes; many require one semester of calculus; some require a course in statistics; and very few require two semesters of calculus. Approximately 35% of the US medical schools have math requirements. A listing of these schools and their requirements is posted on the Health Professions Advising Office website (http://www.brynmawr.edu/healthpro/info/advanced.html). You should discuss whether or not to take calculus with your dean and the prehealth advisor. If you are thinking about majoring in a science, calculus, and/or statistics may be an important course to take. Do not feel that you must enroll in Math 104 immediately; speak to the prehealth advisor first, as you typically cannot enroll in this course in the fall semester. Several academic departments (psychology, sociology, to name a few) have statistics courses as a part of their major requirements. Please note that for the medical schools that have a statistics course requirement, be aware that some state medical schools will only accept statistics courses taught in a math department. Check with the prehealth advisor to see if your home state medical schools have a specific statistics requirement and for help considering what might be the best choice for your situation.
AP and IB credits in math: Most medical schools will accept AP/IB credits to satisfy the premedical math requirement. A few state medical schools, including some from the University of California system, however, will not accept AP or IB credits for their calculus or statistics requirements. If you have AP/IB credit for calculus or statistics, please see the prehealth advisor for more information about math requirements for medical schools in your home state. If you decide to take a math class at Bryn Mawr, you might want to consider taking this while the concepts are fresh in your mind.

Other course requirements: Although medical schools have general requirements for course work in the humanities, some state medical schools, however, have very specific course requirements in social sciences and humanities. The Medical School Admissions Requirements (MSAR) https://www.aamc.org/students/applying/requirements/msar/, published online annually by the AAMC, includes information about course prerequisites. You should meet with the prehealth advisor early in your college career to review course requirements for medical schools in your home state.

THE IMPORTANCE OF STATE RESIDENCY IN THE ADMISSIONS PROCESS

Your state of residence is an important factor in the medical school admissions process. Many medical schools reserve the majority of their seats for in-state residents. You should plan your premedical course work around the requirements for your state medical school because the costs of that medical school may be more reasonable and your chances of being accepted there may be much better than your chances of being accepted to other schools.

HOW SHOULD I FIT THE REQUIREMENTS INTO MY SCHEDULE? WHAT CLASSES SHOULD I TAKE FIRST?

There are many ways to complete the premedical requirements. You should work out the approach that would work most effectively for you by talking with your dean or faculty advisor and with the prehealth advisor. Your primary goal, while at Bryn Mawr, should be to explore your diverse intellectual interests and to take advantage of special academic opportunities while following the requirements for earning a degree. You may complete the premedical requirements in the next four years or after graduation. You will never have a chance to repeat your liberal arts education at Bryn Mawr.

Planning is essential to ensure that you complete the prehealth requirements while achieving your other academic goals. Would you like to study abroad for a semester? Would you like to take a 360? Are you attracted to a major that would have little overlap with the prehealth requirements? Have you always wondered about some fields that weren’t open to you while you were in high school?

Considering science courses:

- Try to be realistic about your preparation for math and science courses. Consider the number of hours you’ll be in class and lab as well as the hours you’ll need for other responsibilities, including maintaining your general well-being. We urge you to read the Dean’s Office information about selecting classes and to work with your Dean as you consider your academics. As questions come up about prehealth requirements, consult with the Health Professions Advising Office.

- In terms of science courses, if you are considering majoring in a science, you should consider taking a course in that subject first. This will give you the opportunity to start college immersed in a discipline that you enjoy and to explore a possible major. (Please note that if you are considering a Biology major, then consult with the Biology Department. Currently, they recommend that you begin with a semester of General Chemistry and during the spring semester, add an Introductory Biology course.)

- If you are not considering a science major, all things being equal, you might want to consider starting in general chemistry, because several chemistry courses are required and they must be taken in sequence (general chemistry – organic chemistry – biochemistry).
Keeping your options open?

If you are not sure whether you want to prepare for medical school at all but want to "keep your options open," remember that the best way to keep those options open is to perform well. If that means postponing your first science course until the sophomore year and possibly postponing your application to medical school, so be it. By waiting until you are more committed to a career in medicine to start taking science courses, you'll ensure that you will be more experienced as a student when you tackle your premedical courses. Some students choose to apply to medical school after graduation. This enables them to take full advantage of the opportunities that Bryn Mawr provides without rushing through the premedical requirements.

TIME FRAME TO MEDICAL SCHOOL: MANY APPROACHES

There are many approaches to completing the courses and developing the competencies necessary to apply to medical school. Although individuals must complete these courses before applying to health professions schools – or in some cases before taking the discipline-specific standardized admissions test - they aspire to begin their graduate study at different stages of their lives. A majority of Bryn Mawr students take a minimum of one year after graduation to work in biomedical or clinical research or to participate in a service program before attending a health professional school; they apply during the summer after senior year and pursue these other opportunities during a 'glide' year (sometimes more than one). Far fewer of our students apply after junior year to go straight into health professions school. Others discover their interest in the health professions after college so they take the premedical courses through a structured academic postbaccalaureate program. Careers in the health professions are both demanding and rewarding, so take the time to find the best fit for you.

The timeline for applying to medical school is much more flexible than it was a generation ago. Since then, the average age of students matriculating at medical school has increased from 22 to 24. Prehealth students have much greater flexibility in preparing themselves for medical school compared to the aspiring physicians of the past.

If you wish to position yourself to enter medical school immediately after graduating from Bryn Mawr, you must complete your premedical requirements and any other courses that you may need to prepare you for the MCAT by the end of your junior year, then take the MCAT, and submit your application during the summer before your senior year. The medical school application process takes more than one year and requires careful planning. (See the medical school application timetable at the end of this section.)

Many students plan to complete the premedical requirements over a longer time frame. At many colleges, a majority of those applying to medical school have decided to plan for a “glide year.” Some of these applicants might prefer the extra time to delve more broadly and deeply into other areas of the liberal arts curriculum or to study abroad for a full year. For some, the pace of juggling the pre-medical courses during their first year or so of college might feel a bit hectic.

Students who plan for a “glide year” have worked as clinical research assistants or laboratory technicians at medical schools or served in the Peace Corps, AmeriCorps or for Teach for America. Students who engage in other activities for one or two years do not find that they are older than most students in their medical school classes. For a variety of reasons, there is a range in the age at which students begin medical school. Medical schools consider each applicant without regard to age. They value candidates who have maturity and work experience. Applicants acquire these qualities and experiences in different ways and on different timetables.

We encourage you to talk with your dean and/or faculty advisor and with the prehealth advisor and develop a plan that works most effectively, given your interests, strengths, experiences, and other considerations. We welcome the chance to work with you as you consider your options and develop your plan.
MORE ABOUT CHANGES TO THE MCAT

As noted above, the MCAT is a computer-based standardized test required for admission by all medical schools. It assesses scientific problem solving skills and critical thinking abilities in standard premedical science courses; in addition, it now tests basic knowledge in biochemistry, behavioral sciences, and quantitative reasoning.

There are multiple ways to learn the biochemical concepts that will be included on the MCAT. As noted earlier, the Bryn Mawr science faculty has reviewed the new MCAT information, and the Bryn Mawr 4-semester chemistry sequence will provide a foundation in general and organic chemistry, and basic biochemistry. You must complete the general and organic chemistry courses before taking the MCAT. Although some students who are very strong in science might be able to supplement their knowledge of biochemistry with intensive self-study, it is advisable to complete a semester of biochemistry before taking the MCAT. There are multiple biochemistry courses in the Bryn Mawr and Haverford curricula, so it will be important to talk with the prehealth advisor, your dean, and for science majors, your major advisor, about which biochemistry course to take. **Please note that if you want to go to medical school directly from college and you want to take a semester-long biochemistry course before taking the MCAT, you must begin general chemistry as a first-year student.**

To prepare for the new MCAT section on Psychological, Social and Biological Foundations of Behavior, you may want to take a psychology course and a course that introduces basic statistics. (Please see the section above for essential information about considering math and statistics courses.)

HOW CAN I LEARN MORE ABOUT THE MCAT?

We recommend that you read AAMC’s information about the MCAT. You can access an interactive tool and download a document describing the content tested in the MCAT on the AAMC’s website at https://students-residents.aamc.org/applying-medical-school/article/understand-mcat-exam/

With this tool, you would be able to consider whether you have sufficient background in the topics covered on the test.

Each fall the Health Professions Advising Office holds an MCAT information session at which we review the format of the test and discuss a variety of study options. Usually junior and senior premedical students attend the information session, but all students are welcome to attend. Typically, premedical students take the MCAT in the late spring or early summer of the year that they are applying to medical school.

I WANT TO STUDY ABROAD. WHAT EFFECTS WOULD THAT HAVE ON MY COURSE SCHEDULE?

Studying abroad can be very enriching and can enable you to gain important experiences that will enhance your work as a physician. It is possible to study abroad, complete the premedical requirements, and apply to medical school. That said, it is important to plan ahead and schedule when you will take the premedical science requirements because U.S. medical schools only accept those courses at US colleges. Many students who study abroad during the academic year do not go to medical school directly from college. Typically, they use senior year as a time to complete one or two remaining premedical course requirements. Some students consider studying abroad during a summer, when they would not otherwise be taking premedical requirements. Discuss your ideas with the Health Professions Advisor, who will help you to consider approaches to reach your goals.
IMPORTANT CONSIDERATIONS

1. We advise most students not to take two lab sciences during the first semester of their first year. Students differ in many ways. Typically, most students need time during their first year to get adjusted to the Bryn Mawr workload and to explore a variety of disciplines, extracurricular activities, and volunteer opportunities. For some students with a strong grounding in the natural sciences, this might focus on their strengths. Each student has a different set of needs to consider.

   In a summer 2015 edition of The Lantern, the Dean’s Office described the pros and cons of taking two lab courses as a first-semester student:

   **Pros:**
   - If you're strong in science, you may want more than one science course in your first semester and may do better overall having a program that focuses on your strengths.
   - Taking two science courses in your first semester can give you more flexibility regarding possible science majors.

   **Cons:**
   - Labs add a lot of additional time to your weekly schedule and can make it hard to fit everything in.
   - Some courses with lab have significant written work and other assessments associated with the lab: lab reports, lab quizzes, lab exams, etc. This can mean taking a course with a lab can feel like you're taking an extra course. So taking two courses with labs can feel like taking two extra courses! This is usually not a good idea for a student adjusting to the more general demands of college.
   - Many students taking two lab courses will also be taking a math course. That may mean their only course outside of math and science is ESem. That may not be enough balance.

2. Do not rush through the requirements and do not overextend yourself academically. Take advantage of special opportunities such as exploring new academic disciplines or studying abroad during the academic year. With careful planning, it is possible to pursue your many interests and to complete the premedical requirements.

3. Take few (or no) credit/non-credit courses. It is best to take all your courses for a grade because medical schools look for applicants who have consistently challenged themselves throughout the undergraduate years. You must take all of your premedical requirements for a grade.

4. Medical schools prefer that you take all your premedical requirements at Bryn Mawr (or at Haverford). If you feel you must deviate from this pattern, please talk to your dean and to the prehealth advisor about the best options.

5. You cannot take any premedical requirements abroad.

LEARNING ABOUT MEDICINE THROUGH EXTRACURRICULAR ACTIVITIES AND COMMUNITY SERVICE

Medical schools are looking for more than strong academic qualifications. Physicians have to be smart--but they also have to be good listeners, capable leaders, team players, ingenious time managers, altruistic, flexible, compassionate, culturally sensitive . . . and more!

There are any number of ways you can demonstrate your compassion, your leadership skills, and your ability to work well with people of diverse backgrounds. Get involved in campus activities--choose to do things that you feel passionate about. You can enhance your skills at working collaboratively and assuming leadership roles through involvement in campus clubs, athletics and part-time jobs; try to view all of your activities as learning opportunities.

You should engage in activities outside of academics. Be careful not to become over-extended. Depth and continuity of a few activities are preferable to joining many activities with minimal involvement. Bryn Mawr has many opportunities for students to develop leadership skills, so take advantage of them.
At its core, medicine is a service-based career. Physicians must be able to establish rapport and trust with patients and their families. You can strengthen your ability to communicate with people from different backgrounds and cultures through community service activities. This can also offer you a chance to feel good about making a difference for others.

As a new college student you may want to participate in one of the many established community service programs through Civic Engagement (CE) https://www.brynmawr.edu/lilac/civic-engagement. For example CE sponsors the Belmont Charter School Monitoring Program, which is an afterschool tutoring program for 2nd-8th grade students. Another popular CE-sponsored program is the Volunteer Income Tax Assistance Program (VITA) in which students are trained to help low-income residents in the Norristown community to prepare their income tax returns.

Before applying to medical school you must gain some experience working in clinical settings. Our office and CE established a directory of health care volunteer opportunities in the region. Read over the healthcare directory and then feel free to discuss possible volunteer opportunities with the prehealth advisor. http://healthvolunteer.blogs.brynmawr.edu/

Becoming a physician and practicing medicine requires significant personal sacrifice and commitment. You should definitely explore medicine from as many perspectives as possible to be certain that it is the right career for you. Here are some ways to start your exploration

- Take advantage of the externships available through the Career and Professional Development (CPD) Office. These are winter and spring break opportunities for you to “shadow” Bryn Mawr or Haverford alumnae/i who are health professionals.
- Attend programs sponsored by the Health Professions Advising Office. Each year we have discussions with alumnae medical students and physicians, we sponsor information sessions by medical school admissions officers, and we hold workshops about preparing for medical school.
- Join the undergraduate Pre-health Society or other student organizations related to health care. See Appendix B about Student Organizations.
- Volunteer in hospitals or other medical settings as much as you can throughout college.
- Your hometown hospital might have a summer premedical volunteer program. These programs sometimes also provide lectures and shadowing opportunities for participating students.
- Pursue a summer internship in the medical field. Although many summer internships are focused on laboratory research, there are some summer internships sponsored by medical schools that provide exposure to clinical medicine. The Career and Professional Development Office also assists students in finding summer internships. Bryn Mawr offers funding to support unpaid summer internships. These are administered by LILAC. For procedures for preparing proposals and applying for funds visit (https://www.brynmawr.edu/summerfunding/)
- Get involved with the outside community; work with underserved populations. When you become a physician, most of your patients will come from diverse backgrounds. A good physician has knowledge, understanding and appreciation of a range of cultures, religions, and socio-economic groups.

THE MEDICAL SCHOOL APPLICATION TIMETABLE

The medical school application process is lengthy. You will take the MCAT and submit a web-based centralized application more than a year before you intend to start medical school. Here is a typical application timetable for a student who is planning to apply to medical school that summer.

**Spring Semester**

(18 months before you intend to start medical school)

1. By the end of the spring semester, finish the premedical course requirements required to prepare you for the MCAT
2. Meet with the prehealth advisor before spring break. At this meeting, you will discuss your credentials file, where to apply to medical school, and which professors and supervisors you should ask for letters of recommendation.
3. Prepare for the MCAT. This includes review and practice tests.
4. Attend the mandatory “How to Apply to medical school” workshop given by the prehealth advisor.
5. Take the MCAT by the end of the spring/early summer.
6. Start working on the centralized web-based medical school application in May.
7. If you are a senior you should work with the Career and Professional Development Office on searching for jobs. Also, talk with the health professions advisor about how the paid and unpaid activities you are considering would fit in with your preparation for and application to.

Summer
1. If you have not already taken the MCAT, take it by early summer.
2. Submit your medical school web-based application as early as possible after June 1. The prehealth advisor is happy to read drafts of medical school application essays.
3. Begin working on and complete secondary applications that are sent to you by individual medical schools.
4. Many medical school admissions officers begin to review completed applications by the end of July, so try to submit all application materials by then, if possible.

Fall Semester
(1 year before you intend to start medical school)
1. Practice medical school interviewing techniques, including newer approaches called MMI. The prehealth advisor works with seniors and with alums on these approaches.
2. Interview at medical schools (hopefully).
3. Continue to plan for financing your medical education. You (and your parents) will need to file your income taxes and complete a FAFSA form in January – February.
4. Schools with a rolling admission process start to send out acceptances as early as October.
5. Check in with the prehealth advisor. We want to know what’s happening with you, to learn about your experiences, to encourage you, and to assist you.

Spring Semester
(6 months before you intend to start medical school)
1. Schools will continue to announce admissions decisions.
2. Accepted students will receive financial aid information in late spring and will need to work with medical schools and banks on payment plans.
3. By April 30 be holding only one place in one medical school.
4. No matter how things are going, please update the prehealth advisor in January. If you have not been interviewed by January or if you are only on wait lists, meet with the prehealth advisor to strategize about your next steps.

The summer before you enter medical school
If you are attending a medical school that has a math requirement, an additional science requirement or a humanities/social science requirement that you did not yet complete, you must take the required course the summer before you enroll.

FREQUENTLY ASKED QUESTIONS

How do I find out about Health Professions events on campus?

The best way to find out about health-related events is to subscribe to the HPAO Prehealth Listserv and to check your Bryn Mawr email regularly. Once you subscribe to this listserv, you will receive announcements via HPAO of activities and events related to the health professions. See the first section of this guide for subscription information.
What is the premedical curriculum at Bryn Mawr?

There is no formal “premed track” at Bryn Mawr. You are welcome to pursue any academic major of interest while completing the science courses to prepare you for medical school. You would pursue the “traditional” premedical requirements, which consist of one year each of biology and physics with labs, and two years of chemistry with labs as well as other courses that are valuable for the MCAT, such as a semester of biochemistry and a semester of psychology. Medical schools also require two semesters of English, one of which is fulfilled by the Emily Balch Seminar. Please note that some medical schools have additional requirements in mathematics, and some require or recommend upper-level biology courses such as biochemistry, microbiology or genetics. Please review the section on course requirements and consult the Health Professions Advisor.

During the next few years, some medical schools will continue to modify their coursework in response to changes in medical education and to the MCAT changes implemented in 2015. The prehealth advisor will keep you informed as new information becomes available.

Must I major in a science in order to go to medical school?

No – you can major in any subject and still complete the premedical requirements. Medicine is an interdisciplinary field that requires not only a solid knowledge in the sciences, but also interpersonal communication skills, excellent writing skills and an empathetic attitude toward others. Majors in the social sciences and humanities also provide ways to cultivate skills that would be helpful in medicine. Yet if you are interested in biomedical research and possibly pursuing an MD/PhD - keep in mind that those programs are looking for students who have extensive research experience, which is generally best obtained through majoring in the sciences.

I am not a U.S. citizen or a permanent resident. Will I be able to attend medical school in the United States?

Unfortunately, it is extremely difficult for international applicants who are not citizens or permanent residents of the United States to gain admission to a U.S. medical school. You will face significant challenges in that many medical schools do not consider applications from international students. In addition, you would be responsible for paying for all of the costs of your medical education. As an international student, you would not be eligible for U.S. government educational loans, which are one of the main ways that U.S. citizens pay for medical education. The medical schools that consider applications without reference to citizenship usually require accepted foreign applicants to pay their tuition up front; sometimes as much as four years’ tuition ($150,000 or more) will need to be paid in advance of starting medical school.

In the United States, less than 1% of medical school students are international students, which reflect the limited amount of medical schools that accept international students and the limited financial aid resources for them. (See Table 4 at https://www.aamc.org/data/facts/applicantmatriculant/)

International students also face similar challenges in gaining admission to and accessing financial resources for other U.S. health professional schools.

I know that the premedical path is difficult. What can I do to meet the challenges?

We encourage you to get to know your professors and the prehealth advisor, to seek help with classes when needed, to get involved with activities on campus, and to explore health care issues on a regular basis. You should also seek out your dean or faculty advisor for advice and support. Remember that during the first year you will be adjusting to many dimensions of college life, including adapting to new methods of teaching, making new friends, and living far from home. In your residential hall get to know your Customs People, Peer Mentors, and Hall Advisors; they are happy to provide a community-based support system and guidance on student life.
I heard that many Bryn Mawr students wait until after graduation to apply to medical school. Is there any benefit to this? What do the applicants do during a year between college and enrolling in medical school?

There is more flexibility in the timetable than there was in the past. At Bryn Mawr and at many other colleges a majority of applicants to medical school choose to take time for other experiences after graduation and before applying to medical school. Those who plan for a “glide year” and apply after college graduation are at no disadvantage. In many cases, they may be at an advantage. Applying to medical school after graduation means that you will be able to show medical schools a complete picture of your four years at Bryn Mawr including any graduation honors, your senior thesis and other academic accomplishments, and information about other senior year activities. Medical schools evaluate applications on the strength of the candidates’ accomplishments; not on their age. Those who take some time between college and medical school do not find that they are older than the typical student. In fact, in recent years, the Association of American Medical Colleges reports show the average age of entering medical students has been 24.

You might choose to wait to apply to medical school for a wide range of reasons. You may want to take additional time to complete the coursework necessary to apply to medical school or to prepare for the MCAT. Or, you may want to pursue exciting post-collegiate opportunities or take time to earn money before beginning medical school.

During the time between graduation and medical school Bryn Mawr alumnae have been involved in a wide range of work and service. For example, some have worked as laboratory or clinical research assistants, others have worked as medical scribes, and others have been involved in service programs (such as Peace Corps, AmeriCorps, or Teach for America). The Career and Professional Development Office helps seniors and alumnae to search for employment or to apply to service programs.

I’m really not sure I want to go to medical school. Will medical schools be interested in a person who wasn’t totally committed to medicine in college?

Going to medical school requires a significant commitment of time, money and energy. Many medical students explore other options and test their commitment thoroughly before feeling confident that medicine is the right choice.

If you decide to defer premedical course work until after college, there are a variety of ways that you can complete the courses at a later date. One option is to take the premedical courses through a structured academic program known as a postbaccalaureate premedical program. You can learn more about these programs by reviewing the AAMC’s national directory of postbaccalaureate premedical programs at https://apps.aamc.org/postbac/#/index

In fact, Bryn Mawr College has a highly regarded postbaccalaureate premedical program that is designed for students who want to go to medical school and have earned their bachelor’s degree but have not taken the premedical requirements. Our program is for career changers who decided to become physicians late in their college careers or several years after graduation. The postbac students at Bryn Mawr are a wonderful, diverse group of people, many of whom have had some impressive life experiences that led them to their desire to become physicians.

Bryn Mawr undergraduates will have the chance to work closely with postbacs in labs, in Health Interest Programming activities, and in on-campus workshops and programs. Every year the postbac class usually includes a few Bryn Mawr, Haverford or Swarthmore alumnae/i. For more information on the Bryn Mawr Postbaccalaureate Premedical program go to www.brynmawr.edu/postbac
What if I’m still unsure about whether I want to attend medical school when I graduate? Have I lost my chance to get Bryn Mawr’s help with the application process?

Whenever you are ready to apply to medical school—even if it’s 10 years from now—the Health Professions Advising Office will be happy to advise you through this process.

Where can I find reliable information about medicine and medical school?

The Association of American Medical Colleges (AAMC) offers comprehensive information to help premedical students consider and prepare for careers in medicine. In the student section of the AAMC website https://students-residents.aamc.org/, you can find ample resources to help students navigate the journey from premedical students through medical residents; one starting point is the AspiringDocs.Org sectionhttp://www.aspiringdocs.org/, which provides valuable fact sheets.
Chapter 3: Preparing for Dental School

Dentistry includes many exciting professional opportunities - from family practice to specialty fields such as orthodontics and oral and maxillofacial surgery. Some dentists also choose to do research and to teach in dental schools. To learn about dental careers visit [http://www.adea.org/GoDental/Career_Options.aspx](http://www.adea.org/GoDental/Career_Options.aspx)

If you are interested in dentistry, check the Prehealth Listserv for activities organized through the Health Interest Programming initiative connected with the HPAO.

Much of the general information about planning for medical school also applies to planning for dental school, so please read the chapter about preparing for medical school. The American Dental Education Association site includes a section for students considering dentistry. Visit [http://www.adea.org/GoDental/Future_Dentists.aspx](http://www.adea.org/GoDental/Future_Dentists.aspx) where you’ll find information about career options in dentistry, preparing for and financing dental school, as well as the dental school curriculum.

Some predental students choose to apply to dental school after graduating from college, which enables them to focus on their studies while taking advantage of the many opportunities afforded by a liberal arts college education. Review the ADEA information about gap years [http://www.adea.org/GoDental/Future_Dentists/Should_I_take_a_gap_year_.aspx](http://www.adea.org/GoDental/Future_Dentists/Should_I_take_a_gap_year_.aspx) Regardless of when you choose to apply to dental school, the prehealth advisor is always available to assist and support you with the dental school application process.

**THE “CORE” PREDENTAL COURSE REQUIREMENTS**

Dental schools require similar preparation in basic sciences as medical schools; some dental schools also have additional course requirements in sciences, math or social sciences. Most dental schools require the following core courses:

- **ONE YEAR OF BIOLOGY WITH LAB**
- **ONE YEAR OF GENERAL CHEMISTRY WITH LAB**
- **ONE YEAR OF ORGANIC CHEMISTRY WITH LAB**
- **ONE YEAR OF PHYSICS WITH LAB**
- **ONE YEAR OF ENGLISH** (One semester of the Emily Balch Seminar plus One additional writing intensive course that can be completed at any time prior to graduation) Some students take the Balch Seminar plus an additional writing course in the English Department. Some students ask if they can take a writing-intensive course offered in a humanities or social sciences discipline. If you do so, you should keep copies of the course description and syllabus and all written materials because dental schools might question whether the course was “writing intensive.” Please note that typically dental schools will accept neither a thesis course as writing intensive, nor a writing intensive course within a natural or physical science discipline. )

**NOTES ON PREDENTAL COURSE REQUIREMENTS**

**Science and Math:** Because some dental schools require additional science or other courses and they differ in their requirements, it is important to consult the prehealth advisor and to check the requirements of schools of interest. The Health Professions Advising Office website includes a listing of dental schools that require upper-level science or math [www.brynmawr.edu/healthpro/info/advanced.html](http://www.brynmawr.edu/healthpro/info/advanced.html). The additional courses required by some dental schools often include biochemistry and microbiology as well as two semesters of anatomy and physiology. Some schools also require genetics. Some dental schools require math, usually one semester of calculus and/or statistics; a few schools also require one semester of psychology. Please ask the prehealth advisor for advice if this is required by the schools that interest you. We strongly suggest that non-science major predental students take 1-2 upper-level biology courses in addition to the core predental course requirements, including at least one course in biochemistry.

**AP/IB credits:** Each dental school has its own policy about accepting AP/IB credits. In general, if you have AP/IB credit for an introductory science, the dental schools strongly prefer or require that you supplement those credits by taking upper-level science courses with labs in the same discipline. It is important to take as many science courses at Bryn Mawr as the total number of required predental
courses, i.e. if you place out of an introductory science course you need to take an upper-level course with lab in the same scientific discipline.

The *ADEA Official Guide to Dental Schools*, published annually by the American Dental Education Association (ADEA), [http://www.adea.org/publications/Pages/OfficialGuide.aspx](http://www.adea.org/publications/Pages/OfficialGuide.aspx) provides detailed information about course prerequisites as well as admission criteria for all U.S. and Canadian dental schools. Copies of the *Official Guide to Dental Schools* are available in the Resources Room of the Health Professions Advising Office.

**THE IMPORTANCE OF STATE RESIDENCY IN THE ADMISSIONS PROCESS**

Your state of residence is an important factor in the dental school admissions process. Many dental state schools reserve the majority of their seats for in-state residents. You should plan your predental course work around the requirements of your state dental school because the cost of that dental school may be more reasonable and your chances of being accepted there are often better than your chances of being accepted to other schools. If you are thinking about dentistry, you should meet with the prehealth advisor early in your college career to review the prerequisites for your state’s dental school.

**NOTE FOR INTERNATIONAL STUDENTS:** International students should be aware that admission to a U.S. dental school is extremely difficult for students who are not U.S. citizens or permanent residents. International students are encouraged to contact the prehealth advisor to discuss the significant challenges faced by international students seeking admission to U.S. dental schools. Many dental schools do not accept applications from international students. Some dental schools will require international applicants to take the TOFEL exam during the application year even if the international student has a degree from a U.S. college. In addition, dental schools often require accepted international applicants to pay their tuition up front; sometimes as much as four years’ tuition may need to be paid in advance of starting dental school. Because international students are not eligible for U.S. government loans, the “up-front” payment of $150,000 - $250,000 requirement may be very difficult to meet.

**SHADOWING DENTISTS AND EXPOSURE TO THE PROFESSION**

An excellent way to gain exposure to the profession is by shadowing a dentist. In fact, nearly all dental schools require applicants to have 50-130 hours of observation at a dental practice prior to applying to dental school. Contact your family dentist to see if you would be able to spend time shadowing at that office during your breaks from college. You should set up a way that the dental office can track your shadowing hours. You may be asked to submit documentation. It is possible to spread out your shadowing hours over the course of your undergraduate career as long as you complete the required number of hours before submitting your dental school application. You can also shadow more than one dentist as long as you meet the shadowing requirements. Many dental schools require a letter from the dentist documenting the total number of shadowing hours as part of the application. Meet with the health professions advisor for information about making the most of shadowing experiences.

**COMMUNITY SERVICE AND VOLUNTEER EXPERIENCES**

Dental schools are looking for applicants who enjoy working with people and have a demonstrated commitment to service. Bryn Mawr’s Civic Engagement (CE) is a great place to start your search for volunteer positions. The CE sponsors several on- and off-campus service programs and can assist you in finding opportunities on your own. [https://www.brynmawr.edu/lilac/civic-engagement](https://www.brynmawr.edu/lilac/civic-engagement)

**DEMONSTRATING “MANUAL DEXTERITY”**

If you enjoy creative arts and working with your hands, you might find dentistry to be an appealing career. Dentists must have great manual dexterity as well as good “3-D” perception. In fact, the dental school application has questions about hobbies involving manual dexterity. These include activities such as drawing, painting, carving, creating 3-D artwork through jewelry-making, sculpting or ceramics, sewing, needlepoint, or embroidering, crocheting or knitting, or playing musical instruments that require
hand-eye coordination. If you do not have artistic hobbies, you may want to join one of the arts clubs on campus as a way to engage in activities that enhance your manual dexterity.

SUMMER PROGRAMS FOR PREDENTAL STUDENTS

There are few formal summer programs for predental students. Check the website of your home state’s dental school to see if they sponsor any summer programs. The Association of American Medical Colleges (AAMC) and the American Dental Education Association (ADEA) sponsor the Summer Health Professions Education Program (SHPEP) a six-week summer program for first-year student and sophomores who are interested in medicine or dentistry or other health professions. For more information, visit http://shpep.org/. Watch the Prehealth Listserv for details about a fall semester information session about SHPEP.

DENTAL ADMISSION TEST (DAT)

All dental school applicants must take the Dental Admission Test (DAT) http://www.adea.org/GoDental/Application_Prep/The_Admissions_Process/DAT_(Dental_Admission_Test).aspx, which is sponsored by the American Dental Association (ADA). The computed-based test takes close to 5 hours and it consists of four parts: natural sciences (introductory biology, general and organic chemistry); perceptual ability (PAT); reading comprehension; and quantitative reasoning. DAT scores, which ranged from a low of 1 to a high of 30, are reported for each of those sections and for two composite scores – the Academic Average and the Total Science score. At the end of the test, examinees receive an unofficial report of their DAT scores. In recent years, the national average DAT score for accepted dental school applicants has been 19-20 for the academic average and PAT sections.

APPLICATION PROCESS FOR DENTAL SCHOOL

The application process to dental school generally takes over one year from starting to study for the DATs to matriculation in dental school. In the spring, approximately 18 months before matriculating in dental school, students usually begin to study for the DATs, request letters of recommendation, and meet with the prehealth advisor to develop their dental school application plans.

The timetable for applying to dental school is similar to the medical school application timetable, so you can review the medical application timetable in Chapter 2 for an overview. Most U. S. dental schools participate in an online centralized application service, AADSAS (Associated American Dental Schools Application Service). http://www.adea.org/GoDental/The_application_to_dental_school_ADEA_AADSAS.aspx Applicants submit the AADSAS application in the early summer one year prior to intended matriculation in dental school. After submitting the AADSAS application, applicants receive supplemental or secondary applications from individual dental schools.

In late summer, dental school admissions committees start reviewing applications and selecting applicants for interviews. The interview season for dental schools start in early fall and ends by February at most schools. Many dental schools offer admission on a rolling basis with the first offers of admission sent out after December 1 of the academic year prior to the academic year of matriculation.

STAY CONNECTED

We encourage all pre-dental students to meet regularly with the Health Professions Advisor and to subscribe to the HPAO Prehealth Listserv, where we announce activities related to dental medicine and other healthcare fields.
Chapter 4: Preparing for Veterinary School

Preparation for veterinary school requires studying sciences as well as extensive experience working with a diversity of animal species - large animals, small animals, and wildlife or exotic species. It is exciting to explore the many options available for careers in veterinary medicine. Veterinarians can work many different settings including private practice, zoos, wild life centers, and animal hospitals. Veterinarians may also do basic research, oversee food production and processing facilities, or serve in a governmental agency. For more information visit http://aavmc.org/Students-Applicants-and-Advisors/Careers-in-Veterinary-Medicine.aspx

THE "CORE" PREVETERINARY COURSE REQUIREMENTS

Veterinary schools differ in their required courses but most veterinary schools have the following core prerequisite courses as well as additional, required science and math courses.

- ONE YEAR OF BIOLOGY WITH LAB
- ONE YEAR OF GENERAL CHEMISTRY WITH LAB
- ONE YEAR OF ORGANIC CHEMISITRY WITH LAB
- ONE YEAR OF PHYSICS WITH LAB
- ONE YEAR OF ENGLISH ONE YEAR OF ENGLISH (One semester of the Emily Balch Seminar plus One additional writing intensive course that can be completed at any time prior to graduation Some students take the Balch Seminar plus an additional writing course in the English Department. Some students ask if they can take a writing-intensive course offered in a humanities or social sciences discipline. If you do so, you should keep copies of the course description and syllabus and of all written materials because veterinary schools might question whether the course was “writing intensive.” Please note that typically veterinary schools will accept neither a thesis course as writing intensive, nor a writing intensive course within a natural or physical science discipline. )

Most veterinary schools require additional courses in biology and math; the specific requirements vary from school to school. The additional required science courses often include biochemistry, genetics, and microbiology. Some veterinary schools require courses in animal physiology and animal nutrition. Some of these may be available through summer sessions at another college. Some schools also require a course in public speaking or communications. Early in your college career, review the veterinary school requirements using the resources below and consult the Health Professions Advisor about your situation.

NOTES ON PREVETERINARY COURSE REQUIREMENTS

AP/IB credits: Each veterinary school has its own policy about accepting AP/IB credits. In general, if a student has AP/IB credit for introductory science, the veterinary schools strongly prefer or require that the student supplement those credits by taking upper-level science courses in the same discipline with labs.

Each year the Association of American Colleges of Veterinary Medical Colleges (AACVM) compiles several important resources:

- **Summary of Course Prerequisites,** a chart listing the prerequisite courses required for each AACVM college can be downloaded at http://www.aavme.org/data/files/vmcas/prereqchart.pdf.

- **“College Descriptor Pages”** summarizing application information, admission procedures, evaluation criteria, entrance requirements, and additional considerations for each school. http://aavmc.org/College-Specific-Requirements/College-Specific-Requirements_College-Specifications.aspx
• AACVM produces a guide to veterinary medical schools, the *Veterinary Medical School Admission Requirements* (VMSAR) [http://www.aavmc.org/publications/vmsar.aspx](http://www.aavmc.org/publications/vmsar.aspx), which provides profiles of all of the veterinary schools, prerequisite course information, and criteria for admission. Copies of the VMSAR are available on the Prehealth Reserve shelf in Collier Library and in the Health Professions Advising Office Resource Room.

**THE IMPORTANCE OF STATE RESIDENCY IN THE ADMISSIONS PROCESS**

Your state of residence is an extremely important factor in the veterinary school admissions process. Most veterinary schools reserve the majority of their seats for in-state residents. States without a veterinary school usually arrange for schools in other states to accept a certain number of their residents. The *Veterinary Medical School Admission Requirements* (VMSAR) lists the contract schools for states that have no veterinary school. You should plan your prevent course work around the requirements of your state’s veterinary school (or your state’s contract schools) because your chances of being accepted there are usually much better than your chances of being accepted anywhere else. If you are thinking about veterinary medicine, you should meet with the prehealth advisor early in your college career to review the veterinary school prerequisites.

**NOTE FOR INTERNATIONAL STUDENTS:** International students should be aware that admission to a U. S. veterinary school is extremely difficult for students who are not U.S. citizens or permanent residents. Many veterinary schools do not accept applications from international students, and international students are not eligible for U. S. government loans, which is the primary form of financial aid for veterinary school. International students are encouraged to contact the prehealth advisor to discuss the significant challenges faced by international students seeking admission to U. S. veterinary schools.

**GAINING EXPERIENCE IN THE FIELD**

All veterinary schools require that applicants have extensive experience working with animals; some schools specify that applicants complete hundreds of hours of primary experience. For example, the University of Pennsylvania School of Veterinary Medicine recommends approximately 500-600 hours and adds, “Experience should be sufficient to convince the admissions committee of motivation, interest, and understanding.” ([http://aavmc.org/pennsylvania.aspx](http://aavmc.org/pennsylvania.aspx)) Most successful veterinary applicants will have experience working with several different species, including both large and small animals. Veterinary schools prefer applicants who have worked in different settings in order to gain exposure to many of the practice environments of veterinary medicine. While shadowing a veterinarian is an important learning experience, it is essential that applicants gain direct animal handling experience under the supervision of a veterinarian. **Also, please note that most veterinary schools require applicants to submit at least one letter of recommendation from a veterinarian who has supervised the applicant’s work with animals.**

Bryn Mawr students find creative ways to gain experience in veterinary work. Most use summer breaks to gain experience. For example, students have worked as stable hands at barns and animal caretakers for private practices or have found internships at zoos or wildlife centers. There are a few special opportunities to gain some of this experience during the academic year. The Matthew J. Ryan Veterinary Hospital at the University of Pennsylvania has a formal prevet student volunteer program. Several years ago, a Bryn Mawr student took advantage of the Bryn Mawr Praxis program ([https://www.brynmawr.edu/lilac/praxis-courses](https://www.brynmawr.edu/lilac/praxis-courses)) to engage in an independent study class with an internship at the Philadelphia Zoo. Some veterinary school applicants apply after graduating from college, gaining additional time to gain the required veterinary experience while also taking full advantage of the many opportunities afforded by a liberal arts college education. Regardless of when you choose to apply to veterinary school, the prehealth advisor is always available to assist and support you with the veterinary school application process.
APPLICATION PROCESS FOR VETERINARY SCHOOL

Prevet students generally submit their applications in mid-July to mid-August, one year before intended matriculation in veterinary school. Most U. S. veterinary schools use an online centralized application service, VMCAS (Veterinary Medical College Application Service). [http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx](http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx)

GRE

Most veterinary schools require applicants to take the GRE (Graduate Record Exam) general test. [http://www.ets.org/gre](http://www.ets.org/gre) You should plan to take the GRE no later than July one year before you plan to start veterinary school.

STAY CONNECTED

We encourage all pre-veterinary students to meet regularly with the Health Professions Advisor and to subscribe to the HPAO Prehealth Listserv, where we announce activities related to veterinary medicine and other healthcare fields.
Chapter 5: Preparing for Graduate Studies in Public Health

Public health is an interdisciplinary field that emphasizes a proactive, preventative approach to sustaining healthy communities. Public health professionals are inspired by the mission to promote physical and mental health and to prevent disease, injury and disability among communities and populations. They focus on communities and population health rather than on individuals.

Because the field of public health encompasses such a range of services and responsibilities, graduate schools of public health are interested in applicants with a variety of undergraduate majors. Almost any undergraduate course of study will prepare you to enter at least one of the public health specialties. Although it is not a prerequisite, it is useful to take a course in statistics prior to starting a graduate program in public health because you will be required to take graduate level statistics courses as part of a public health degree program.

*The core areas in public health study are:

- **Behavioral Science/Health Education**: the development of methods, skills and program strategies to help people maintain healthier lifestyles; the design and implementation of programs that affect health.

- **Biostatistics**: the application of statistical procedures, techniques, and methodology to characterize or investigate health problems.

- **Emergency Medical Services**: the administration of emergency response procedures including training, licensing, quality control, access, research, or disaster preparedness.

- **Environmental Health**: the assessment of the impact of environmental factors on community health.

- **Epidemiology**: the systematic study of the distribution and determination of disease or disability in population groups.

- **Health Services Administration/Management**: the application of business, policy, and science to manage resources and the delivery of public health services.

- **International/Global Health**: the effort to improve health standards in developing countries using the skills and techniques of all public health specialties.

- **Maternal and Child Health**: the integration of many fields in public health to focus on the needs of women and children.

- **Nutrition**: the study of the interaction between nutrients, nutrition and health and the application of sound nutritional principles to maintain good health.

- **Public Health Laboratory Practice**: the application of basic science and laboratory research to help with the diagnosis, treatment, and prevention of infectious diseases in communities.

- **Public Health Policy**: the effort to effect legislation about public health issues from local governments to international policymaking organizations.

*This is adapted from [https://www.apha.org/what-is-public-health](https://www.apha.org/what-is-public-health)
**Graduate Study:** Most often, public health professionals complete a master’s degree, which takes two years of graduate study. The Master of Public Health (MPH) is an interdisciplinary degree that includes courses from health administration, epidemiology, environmental health, and behavioral health. There are also other graduate degrees with a specific focus in individual fields of public health such as Master of Health Services Administration or a Master of Science in Epidemiology. Applicants to graduate programs in public health take the GRE (Graduate Record Exam) and (for most schools) apply through a centralized web-based application service known as SOPHAS. [www.sophas.org](http://www.sophas.org). For a searchable database of public health programs, affiliated with the Association of Schools and Programs of Public Health (ASPPH), visit [http://sophas.org/program-finder/](http://sophas.org/program-finder/). There, you can also request a digital view book of graduate programs.

MPH programs expect students to have work experience prior to application. Some programs will accept applications from college seniors who have gained significant experience through summer internships whereas other schools firmly require that applicants work after graduating from college before applying. There are many opportunities through Bryn Mawr to gain experience related to public health. Some Bryn Mawr and Haverford courses have an experiential learning component such as a field placement or internship. Many students have been able to draw on Praxis courses as a way to explore issues related to public health. For more about Praxis courses visit [https://www.brynmawr.edu/lilac/praxis-courses](https://www.brynmawr.edu/lilac/praxis-courses) Civic Engagement also sponsors service programs, internships, and other opportunities to engage in activity and reflection related to public health.

**We recommend the following sources of additional information about public health:**

- **American Public Health Association (APHA)** [https://apha.org/](https://apha.org/) and [https://apha.org/what-is-public-health](https://apha.org/what-is-public-health)
- **Public Health Pathways for Pre-Medical Students**
  Searchable database of training opportunities to enhance their understanding of social and environmental factors that influence the health of the people and communities they serve. [https://students-residents.aamc.org/applying-medical-school/article/public-health-pathways/](https://students-residents.aamc.org/applying-medical-school/article/public-health-pathways/)
- **Public Health and Service section of the AAMC careers in medicine website**
  Learn about paths for involvement in public health issues as a physician [https://www.aamc.org/cim/career/alternativecareers/publichealthandservice/](https://www.aamc.org/cim/career/alternativecareers/publichealthandservice/)

If you are interested in public health, watch the Prehealth Listserv for relevant events on campus and elsewhere. Each year, there are many such events, including those sponsored by the Health Interest Programming initiative. (See Appendix B.) Also, there are opportunities to speak with members of the Bryn Mawr community who have an MPH or significant experience in the field. Each year, a number of postbac premedical students have engaged in full-time work in public health. Many of them work with undergraduates to help organize Health Interest Programming on related topics.

Please note that in fall 2017, Bryn Mawr began a partnership with the Boston University School of Public Health Select Scholars Program, which offers a set of **4+1 Master's Programs offering** opportunities for Bryn Mawr undergraduates to earn an accelerated master’s degree (MS) in a public health field or to earn a Master of Public Health degree (MPH) with additional study. For the full description, see Chapter 8 of this Guide. To learn more about this program, contact the Health Professions Advisor and visit [https://www.brynmawr.edu/academics/combined-degrees/abmasters-programs-partner-institutions](https://www.brynmawr.edu/academics/combined-degrees/abmasters-programs-partner-institutions).
Chapter 6: Exploring Other Health Professions

A number of other health professions are taking a greater role in the delivery of patient care. As a starting point for your exploration, we recommend ExploreHealthCareers.org

http://explorehealthcareers.org/en/home  a multi-disciplinary, interactive health careers website that offers a reliable, comprehensive source of accurate, up-to-date information about the health professions. This includes information on and links to health professions training programs and financial aid resources.

The prerequisite courses for acceptance into a graduate level program vary significantly from profession to profession and school to school. If you are interested in health professions, you should explore the prerequisites for graduate study early in your college career. The Health Professions Advising Office website has links to a wide range of professional organizations for other health professions. We encourage you to meet with the health professions advisor to discuss your interests.

Below are some websites to other health professions that Bryn Mawr students have pursued in recent years.

Nursing (including Nurse Practitioner):  American Association of Colleges of Nursing

http://www.aacn.nche.edu/

As a liberal arts college, Bryn Mawr does not offer a baccalaureate degree in nursing (BSN). Note that some Bryn Mawr alumnae have pursued accelerated second bachelor’s degree nursing programs. Many of these accelerated programs enable their students to earn a Bachelor of Science in Nursing in 1½ to 2 years. Be aware that the prerequisite course requirements vary between programs and that some prerequisite courses, such as human anatomy and physiology are not offered in the Tri-College curricula. Your health professions advisor can help you as you plan to take these courses.

For information about and lists of accelerated programs visit

Information about Accelerated Baccalaureate and Master’s Degrees in Nursing

http://www.aacnnursing.org/Nursing-Education-Programs/Accelerated-Programs

Fact Sheet: Accelerated Baccalaureate and Master’s Degrees in Nursing (updated June 2017)

http://www.aacnnursing.org/Portals/42/News/Factsheets/Accelerate-Programs-Fact-Sheet.pdf

Finding Accelerated Baccalaureate Programs for Non-nursing College Graduates

Search this interactive database:  http://www.aacnnursing.org/Nursing-Education

Occupational Therapy:  American Occupational Therapy Association

http://www.aota.org

Optometry:  American Optometric Association (AOA)

http://www.aoa.org/

Association of Schools and Colleges of Optometry (ASCO)

http://www.opted.org

Pharmacy:  American Association of Colleges of Pharmacy

http://www.aacp.org

Physical Therapist:  American Physical Therapy Association

http://www.apta.org

Physician Assistant:  Association of Physician Assistant Programs

http://www.aapa.org

Speech Therapy:  American Speech-Language Hearing Association

http://www.asha.org
Chapter 7: Health Studies Minor

In the spring of 2014, Bryn Mawr and Haverford Colleges launched an exciting new minor in Health Studies. This multidisciplinary program brings together faculty and students from a wide range of academic fields to explore biomedical, cultural, ethical, and political questions related to health issues on local, regional, and global scales.

Health Studies includes a multidisciplinary introductory course as well as a capstone seminar. Courses included in the program cluster around three core areas:

- **M Track** – Mechanisms of disease and the maintenance of the healthy body
- **R Track** – Cultural, literary, and visual Representation of health and illness
- **S Track** – Familial, social, civic, and governmental Structures that respond to issues of health and disease.

For more information, visit the Health Studies website [https://www.brynmawr.edu/healthstudies](https://www.brynmawr.edu/healthstudies)
Chapter 8: Master’s Programs with Partner Institutions

Bryn Mawr has a number of partnerships with other institutions to expand learning opportunities and lead to advanced degrees. In chapter 5, we mention the new 4 + 1 program with the Boston University School of Public Health.

4+1 Master of Bioethics Program at Perelman School of Medicine
Qualified Haverford and Bryn Mawr undergraduates will gain early and expedited admission to a Master’s Degree offered by the Penn Department of Medical Ethics and Health Policy. Student may apply to the MBE program as an external “sub-matriculate.” For more information, contact the Health Professions Advisor.

4+1 Master's Programs at the Boston University School of Public Health In fall 2017, Bryn Mawr began a new partnership – the Boston University School of Public Health Select Scholars Program, which offers a set of 4+1 Master's Programs, offering unique opportunities for Bryn Mawr undergraduates with an interest in this vibrant and growing field. Accelerated master's degree 4+1 programs include:

- MS in Applied Biostatistics
- MS in Environmental Health Data Analytics
- MS in Epidemiology
- MS in Health Systems and Services Research
- MS in Public Health Nutrition

In addition, students can earn a Master’s degree in Public Health (MPH) with the 4+1.5/2 program. Scholarships are available to support up to 25 percent of tuition. Admitted students are invited to participate in an immersive summer program during the first full week of June every year. To learn more about this program, contact the Health Professions Advisor.

Some prehealth students might be interested in other programs, such as the 4+1 Master of Engineering degree with the University of Pennsylvania School of Engineering and Applied Science. For a full list of programs, visit https://www.brynmawr.edu/academics/combined-degrees/abmasters-programs-partner-institutions
Appendix A: Programs to Increase Diversity in the Health Professions

In an ideal world the demographics of the healthcare work force would mirror the demographics of the country as a whole. Professional societies, educational institutions, and the U. S. government recognize that the health professions and the provision of health care would improve with a more diverse healthcare work force.

A number of racial and ethnic populations are underrepresented in the health professions relative to their numbers in the general population. Historically the term “underrepresented” referred to four historically underrepresented groups - Blacks, Mexican-Americans, Native Americans and mainland Puerto Ricans. The term “underrepresented” has been expanded to include a broader range of ethnicities as well as consideration of socioeconomic disadvantage. In addition, there is a greater focus on regional and local demographics in an effort to improve the cultural competencies of graduating physicians and to improve access to care for underserved populations. Schools of dentistry and veterinary medicine – as well as other health professions - have also responded to the need to increase diversity within their fields. Below you will find information and links to programs to recruit and support students from groups underrepresented in the health professions and from financially disadvantaged backgrounds.

The American Association of Medical Colleges’ (AAMC) definition of underrepresented in medicine is: "Underrepresented in medicine means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population." For more information, visit the AAMC website https://www.aamc.org/initiatives/urm

If you are from a group that is underrepresented in medicine as defined by the health professions or from a financially disadvantaged background, please be aware that there are opportunities that may be available to you, including:

- Summer academic programs
- Summer research programs
- Postbaccalaureate programs designed to help students prepare for the MCAT and to provide opportunities to further demonstrate ability in the sciences

Explore these resources that are designed to increase diversity in health care professions:

HEALTH PROFESSIONS (Including medicine, dentistry, nursing, pharmacy, and public health)
SUMMER HEALTH PROFESSIONS EDUCATION PROGRAM (SHPEP)

SHPEP is a free, six-week summer enrichment program that offers eligible students intensive exposure to resources to explore and to prepare for health professions schools. Formerly known as SMDEP, the program recently expanded beyond medicine and dentistry to include a broader range of health professions. Eligible students include, but are not limited to, individuals who identify as African American/Black, American Indian and Alaska Native and Hispanic/Latino, and who are from communities of socioeconomic and educational disadvantage.

DENTISTRY

The American Dental Education Association (ADEA) Resources on Diversity
The American Dental Association (ADA) reports that there is critical need to increase the representation of minority dentists It is working on initiatives to expand access to dental education and to enhance the cultural competency of all dental students.
http://www.adea.org/GoDental/Dentistry_101/Need_for_diversity.aspx

“Something to Smile About: Careers in the Dental Profession,” American Dental Association (ADA) brochure for students in groups underrepresented in dentistry
http://www.ada.org/~/media/ADA/Education%20and%20Careers/Files/minority_dentist_brochure.pdf?la=en

Summer Health Professions Education Program (SHPEP), which is described above.
MEDICINE (ALLOPATHIC)
MINORITIES IN MEDICINE
The AAMC website Minorities in Medicine lists information related to medical student preparation, the medical education pipeline, and financial aid opportunities.
https://www.aamc.org/students/minorities/

Summer Health Professions Education Program (SHPEP), which is described above.

MEDICINE (OSTEPATHIC)
Diversity in Osteopathic Medical Education
The American Association of Colleges of Osteopathic Medicine (AACOM) prepared a website that includes data about diversity in osteopathic medical education as well as links to resources for students in groups underrepresented in the field.
https://www.aacom.org/become-a-doctor/diversity

VETERINARY MEDICINE
The Association of American Veterinary Medical Colleges’ DiVersity Matters initiative sponsors the AAVMC’s programs to foster diversity within the veterinary professions.
Appendix B: Prehealth Student Organizations

Bryn Mawr’s tradition of self-governance promotes students as leaders for extracurricular activities and organizations, and this is evident in the prehealth community. Undergraduates direct several organizations related to the health professions.

PRE-HEALTH SOCIETY

The Pre-health Society organizes activities for all students interested in careers in the health professions. In recent years, events include student panels to discuss summer internships, fundraisers for the American Cancer Society and the Red Cross, and talks by outside speakers who work in health care. The Pre-health Society will have a table at Fall Frolic, and you can sign up for their listserv at that time.

HEALTH INTEREST PROGRAMMING

Health Interest Programming brings together Bryn Mawr undergraduates and postbaccalaureate premedical students to engage in programming related to healthcare. The Health Professions Advising Office (HPAO) provides a framework to support students in developing and scheduling events related to key areas of interest.

From year to year, the focus group topics vary depending on the interests of the students involved. During the first week of classes, the list of 2017-2018 Health Interest Programming Groups and the contact information for the student leaders will be announced via the HPAO Prehealth Listservs and website.

Examples of previous Health Interest Programming activities:
- Hosting speakers on campus
- Arranging panel discussions on topics of interest
- Finding and discussing pertinent journal articles
- Hosting brown bag lunches with faculty whose research is relevant
- Viewing movies or documentaries about specific topics in medicine

Examples of previous Health Interest Programming Clusters:
- Dentistry
- Emergency and wilderness medicine
- Ethics
- Global Health
- Infectious diseases
- Integrated/alternative medicine
- Neurology/psychiatry/ Mental Health
- Nutritional health
- Pediatrics
- Public health
- Veterinary medicine
- Women’s health
Appendix C: Professionalism

Serving others through a career in the health professions requires responsibility, sensitivity, maturity, solid judgment, leadership and good interpersonal skills. Your interactions with faculty and your participation in internships and service in the community help you to develop those qualities, which are dimensions of professionalism.

Whether you are applying for internships, working on a project with peers, faculty or staff, or volunteering in the community, you should be courteous and professional in all of your interactions. Here are some general pointers to consider as you move prepare for a career.

Communication issues

1. When choosing user names for email accounts, online web applications, and other online forms, choose a professional sounding username. The username often appears first on electronic forms, so you would not want a provocative name to create a negative first impression with the reader. Sometimes it is not possible to change the username in an application or with a web service.
2. You should set up a separate email account that you will only use for your professional activities such as correspondence about internships, applications, etc. Create a basic signature file containing your name and contact information.
3. Do not write any email messages as if you were text-messaging or e-chatting with a friend. It is easy to do this, so carefully read over your emails before you send them.
4. If you provide your cell phone number on a resume or to prospective supervisors, make sure that you have an appropriate voicemail greeting.
5. When asking for letters of recommendation remember that the recommenders, especially professors, often have many other recommendation letters to write in addition to other work. Ask with plenty of advance notice, and provide specific information about where and how the letter of recommendation is to be sent and what the deadlines are. It helps to give them a copy of your resume, as well.

Online Persona

It is likely that there is a significant amount of information about you on the Internet. Keep this in mind and recognize that employers and admissions committees often check online to find out additional information about applicants. When online, consider these issues:
- Facebook, Instagram, Tumblr, etc. accounts are not always as secure as they purport to be.
- Make sure you present the portrait that you want people to see; many employers or admissions officers will look up applicants before making an offer.
- Check your privacy settings often.
- What you post on blogs and websites can be archived; like email, nothing is ever truly deleted. If you are posting sensitive information, make sure it is in an absolutely inaccessible area.
- It would be a good idea to use Google and other search engines to learn what is posted about you. You don’t want to be caught off-guard and discover that there is information that might portray you in an unflattering way.
- Even sites like Twitter, where content changes rapidly, can provide a way for others to form an opinion about you. It is a good idea to exercise discretion with online posts of any kind.

The Association of American Medical Colleges (AAMC) published “How Social Media Can Affect Your Application,” which offers perspectives from medical school admissions officers on the effects of social media on the medical school application process. https://students-residents.aamc.org/applying-medical-school/article/how-social-media-can-affect-your-application/
Appendix D: Core Competencies

This list is adapted from the Core Competencies for Entering Medical Students published by the AAMC. [https://www.aamc.org/admissions/dataandresearch/477182/corecompetencies.html](https://www.aamc.org/admissions/dataandresearch/477182/corecompetencies.html) Although this list was prepared for aspiring medical students, it would be applicable for all budding health professionals.

A recommendation: While you are taking courses and engaging in experiential learning to prepare for health professions school, consider the core competencies. Consider how you have been developing Interpersonal, Intrapersonal, Thinking and Reasoning, and Science competencies while taking a course, when working in a paid or unpaid position, when engaging in community service, when exploring a health care setting how have you been developing.

INTERPERSONAL COMPETENCIES

- **Service Orientation**: Demonstrates a desire to help others and sensitivity to others’ needs and feelings; demonstrates a desire to alleviate others’ distress; recognizes and acts on his/her responsibilities to society; locally, nationally, and globally.
- **Social Skills**: Demonstrates an awareness of others’ needs, goals, feelings, and the ways that social and behavioral cues affect peoples’ interactions and behaviors; adjusts behaviors appropriately in response to these cues; treats others with respect.
- **Cultural Competence**: Demonstrates knowledge of socio-cultural factors that affect interactions and behaviors; shows an appreciation and respect for multiple dimensions of diversity; recognizes and acts on the obligation to inform one’s own judgment; engages diverse and competing perspectives as a resource for learning, citizenship, and work; recognizes and appropriately addresses bias in themselves and others; interacts effectively with people from diverse backgrounds.
- **Teamwork**: Works collaboratively with others to achieve shared goals; shares information and knowledge with others and provides feedback; puts team goals ahead of individual goals.
- **Oral Communication**: Effectively conveys information to others using spoken words and sentences; listens effectively; recognizes potential communication barriers and adjusts approach or clarifies information as needed.

INTRAPERSONAL COMPETENCIES

- **Ethical Responsibility to Self and Others**: Behaves in an honest and ethical manner; cultivates personal and academic integrity; adheres to ethical principles and follows rules and procedures; resists peer pressure to engage in unethical behavior and encourages others to behave in honest and ethical ways; develops and demonstrates ethical and moral reasoning.
- **Reliability and Dependability**: Consistently fulfills obligations in a timely and satisfactory manner; takes responsibility for personal actions and performance.
- **Resilience and Adaptability**: Demonstrates tolerance of stressful or changing environments or situations and adapts effectively to them; is persistent, even under difficult situations; recovers from setbacks.
- **Capacity for Improvement**: Sets goals for continuous improvement and for learning new concepts and skills; engages in reflective practice for improvement; solicits and responds appropriately to feedback.

THINKING AND REASONING COMPETENCIES

- **Critical Thinking**: Uses logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
- **Quantitative Reasoning**: Applies quantitative reasoning and appropriate mathematics to describe or explain phenomena in the natural world.
• **Scientific Inquiry**: Applies knowledge of the scientific process to integrate and synthesize information, solve problems and formulate research questions and hypotheses; is facile in the language of the sciences and uses it to participate in the discourse of science and explain how scientific knowledge is discovered and validated.

• **Written Communication**: Effectively conveys information to others using written words and sentences.

**SCIENCE COMPETENCIES**

• **Living Systems**: Applies knowledge and skill in the natural sciences to solve problems related to molecular and macro systems including biomolecules, molecules, cells, and organs.

• **Human Behavior**: Applies knowledge of the self, others, and social systems to solve problems related to the psychological, socio-cultural, and biological factors that influence health and well-being.