



WAKE FOREST  
UNIVERSITY



# 2019-20

PRE-HEALTH  
PROFESSIONS  
HANDBOOK



# The Wake Forest University Pre-Health Professions Handbook

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## **FREQUENTLY ASKED QUESTIONS**

### **I am an entering freshman. What courses should I take in the first year?**

If you are interested in medicine PA, or dentistry, in the first semester, you should take CHM 111 with lab. In the spring, you should register for CHM 122.

### **When should I start biology courses?**

If you are not planning on majoring in biology, you should begin biology with BIO 150 in the spring of your freshman year. If you plan to major in biology, you can start BIO 150 in the fall of your first year, along with chemistry. But this is only recommended if you are confident of your ability to excel in two college-level lab courses.

### **With whom should I speak if I am interested in attending a health professions program such as in medicine, dentistry, nursing, etc, after I graduate?**

In addition to your academic advisor, there are eight health professions advisors who are available to consult with you on the prerequisites and application process for the various programs. You can find a list of the health professions advisors and their areas of specialty on page 7 of the in the Health Professions Handbook and on the Health Professions web page (<http://college.wfu.edu/prehealth/>).

### **How do I get an appointment with a health profession advisor?**

See page 7 of this Handbook for a list of the Health Professions Advisors and contact information for making an appointment.

### **When should I apply?**

It depends on what type of program you are looking at. Students applying to programs such as dentistry and physical therapy most often apply at the end of the third year. Physician Assistant programs have very specific requirements that most often require a year beyond graduation before applying.

Many prestigious schools have designed pre-medical and pre-dental programs that use the full four years of college to prepare their students for admission to health professions schools, so that students do not apply until just after graduation.

The important thing is not to apply before you are ready! Professional schools are looking for students that have demonstrated that not only are they good students, but that they are committed to service and have a breadth of life experiences. Every year, you will become more mature and have more life experiences that will make you a more competitive applicant. If you wait to apply until after your fourth year, your senior year grades will be included in the

consideration of your application. By this time, you will be taking mostly courses in your major and elective courses, in which students generally do very well. This is an opportunity to maximize your GPA.

Finally, if you are applying to medical school, an exam known as the MCAT is required for admission. It is a very difficult exam, and requires a considerable amount of intense study. If you wait until after your fourth year to apply, you allow yourself the entire summer between the third and fourth years to study for the MCAT. Taking the exam during the academic year jeopardizes both your GPA for the semester and your score on the MCAT exam.

**If I am a pre-health professions student, is it possible to study abroad?**

Absolutely! Even pre-medical students and pre-physician assistant students who have the greatest number of prerequisite courses to complete can study abroad. Please see the course planning guides in the Health Professions Handbook. Whatever health profession program you are aspiring to, study abroad is possible, but it takes careful planning. Visit the Office of Global Programs and Studies in Reynolda Hall during your first semester, and begin to plan!

**Is there a study abroad program that will allow me to complete prerequisite courses that I need for my health professions program?**

It is difficult to find science courses in English abroad unless you study in an English-speaking country. But if you plan ahead, you can fit all of your science prerequisites in while at Wake Forest, and use your study abroad time to appreciate the art, history and culture of the country in which you choose to study.

An alternative is to study at one of the Wake Forest programs offered in London, Vienna, Venice, or Chile. Often science faculty from Wake Forest teach at these programs for a semester or in the summer, giving you an opportunity to take prerequisite courses in English. Check with the Office of Global Programs and Studies well in advance to see when science faculty will be taking students abroad, and what courses will be offered.

**What else should I be thinking about besides course work to make me competitive for a health professions program after I graduate?**

All of the health professions programs require that you have community service and some volunteer clinical service hours, and that you have “shadowed” (interned with) a professional who works in your chosen profession.

The other thing that you should be thinking about is that in three or four years you will need at least three letters of recommendation, two of which will most likely be from faculty members. Get to know several professors. Take a professor that you have enjoyed for more than one class. Work with faculty on projects in which they are involved. Visit during office hours.

Discuss your career aspirations. Let the faculty know who you are above and beyond your performance in their class.

### **What is the Health Professions Committee?**

The Health Professions Committee is comprised of all of the health professions advisors. Besides serving as advisors for students interested in various health professions, members of the committee evaluate and rank pre-medical and pre-dental undergraduate students as part of their application process to medical or dental school.

### **What is the “committee letter”?**

Medical and dental schools ask for a letter from the students’ undergraduate institution that expresses the degree of support that the institution has for the student’s application and an explanation of that support. This letter is written by the Director of Health Professions Advising, with input from the Health Professions Committee. Information on the application process and deadlines can be found in the Health Professions Handbook and online at <http://college.wfu.edu/prehealth/>.

## The Health Professions Advisors

### **Premedical, years 3 and 4**

Dr. Carole Gibson, Professor, Department of Biology  
Director of Health Professions  
Chair, Health Professions Committee

To make an appointment with Dr. Gibson:

<https://gibsoncl.youcanbook.me/>

### **Premedical, years 1 and 2**

Dr. John Tomlinson, Associate Teaching Professor,  
Department of Chemistry  
Assistant Director of Health Professions

To make an appointment with Dr. Tomlinson:

<https://john-tomlinson.youcanbook.me>

### **Physician Assistant**

Dr. Jane Albrecht, Professor  
Department of Romance Languages  
Division II

To make an appointment with Dr. Albrecht, e-mail [albrecht@wfu.edu](mailto:albrecht@wfu.edu)

### **Physical/occupational therapy A-K**

Dr. Samuel Cho, Associate Professor  
Departments of Physics and Computer Science  
Division V

To make an appointment with Dr. Samuel Cho, e-mail [choss@wfu.edu](mailto:choss@wfu.edu)

### **Physical/occupational therapy L-Z**

Dr. Kristina Gupta, Assistant Professor,  
Department of Women and Gender Studies  
Division I

To make an appointment with Dr. Gupta, e-mail [guptaka@wfu.edu](mailto:guptaka@wfu.edu)

### **Pre-dental and pre-veterinary**

Dr. Katy Lack, Associate Teaching Professor  
Department of Biology  
Division V

To make an appointment with Dr. Lack, e-mail [lackak@wfu.edu](mailto:lackak@wfu.edu)

### **Nursing/Pharmacy/Audiology**

Dr. Fred Salisbury, Professor  
Department of Physics  
Division V

To make an appointment with Dr. Salisbury, e-mail [salsbufr@wfu.edu](mailto:salsbufr@wfu.edu)

For general inquiries, please contact [prehealth@wfu.edu](mailto:prehealth@wfu.edu).



## **INTRODUCTION**

There are a variety of health professions, each of which plays a vital role in meeting health care needs. This handbook contains information about what you should do as an undergraduate at Wake Forest to prepare for careers in these fields.

Which health profession to pursue often seems an easy choice at first, but as you become more familiar with the differences between them and the requirements for each, you may become interested in an alternate career path.

The Health Professions Program at Wake Forest is designed to ensure that you are aware of what it takes to be a competitive applicant to the health professions program of your choice. We cannot make you a competitive applicant. Only you can do that. We will provide information and guidance, but the rest is up to you.

What is a competitive GPA or other test score varies by program, as do the requirements for experience and prerequisite courses. Generalized lists of prerequisite courses for each type of health professions program are listed in this Handbook, but as you approach your final year, be sure to check the web sites of the programs to which you plan to apply. Some schools will have additional prerequisites.

## **BECOMING A COMPETITIVE APPLICANT: ACADEMICS**

As you enter Wake Forest, you will be assigned a lower division academic advisor who will see you through to the spring semester of your second year. Since you will not select a major until the end of the second year, your lower division advisor will most likely be in a field unrelated to the one in which you eventually major. If you are interested in a career in medicine, dentistry or veterinary medicine, you should attend one of the health professions introductory sessions that will be held during the first few weeks of classes. Regardless of the health profession field that you are interested in, if you find yourself struggling academically or have concerns about course selection, please check in with the appropriate Health Professions Advisor.

As you begin your first year, you may find that the level of coursework is surprisingly more challenging than in high school. There will be a lot of distractions that may pull you away from your studies. Stay focused academically. Programs in medicine, dentistry, physician assistant, physical therapy and others are very competitive. Don't dig a hole that causes you to have to work twice as hard later to be competitive for admission. At the same time, remember that being competitive means much more than just a good grade point average. Most programs are

looking for well-rounded individuals who have a variety of interests and who have demonstrated a concern for the welfare of others.

First year students, don't worry about your choice of major. Take the courses that will keep you on track for admission to a program in your chosen field, and then use the wide variety of divisional courses offered to explore various areas of study. As you near the end of your second year, you may be surprised by what you choose as your major. Majoring in a science may not offer an advantage. For almost all of the health professions, including medicine, what is important is that you complete the prerequisite courses. Major in what you enjoy the most! You will most likely do better academically.

### **AP or IB Credit**

Most medical school programs will accept AP or IB credits for prerequisite courses, but some do not. Most PA programs do **not** accept AP credit for prerequisite courses. For those schools that accept AP credit, it must appear on your Wake Forest transcript. Some schools will allow additional advanced coursework in that discipline to substitute for courses for which AP credit has been awarded. So should you retake courses for which you have received credit? Probably no for medicine. For PA schools, look carefully at the web sites of schools to which you might apply before deciding.

### **Online Courses**

Some programs accept online courses. Most programs do not accept online courses in the sciences, particularly if they have a laboratory component. Some schools will accept blended courses, where lectures are online but the lab is done in person. Unless you have graduated and are unable to take a course any other way, it is best not to take any science courses online. If the only way that you can take a course is to take it online, be sure to check with the programs to which you plan to apply before doing so. If the programs you are interested in do accept online courses, these courses have the advantage of offering considerable flexibility that allows you to take a course while working. Many (but not all) allow you to work at your own pace. Important things to take into consideration: Is the program accredited? What is the academic reputation of the institution offering the course? Is the instructor qualified?

### **Summer Courses**

Most of your science courses should be taken at Wake Forest, so that schools know that you have had a rigorous experience in these courses. If you do choose to take one or two courses elsewhere, make sure that it is at an accredited four-year university or college. Unless you are a science major, it is not necessary that the courses transfer into Wake Forest. You will need to



submit an additional transcript for with your professional school application for courses taken elsewhere.

Courses taken in the summer for transfer must be pre-approved by the department before the course is taken. The Registrar's Office keeps a list of courses that are already pre-approved.

## **Repeating Courses**

The best thing to do is to never get into a situation where you have to repeat a course! Most programs will not accept grades lower than a "C". So if you get a C- or lower in a class, you will need to repeat it. But if you are struggling in a course, don't attempt to earn a C- or lower rather than a C just so you can repeat the course. Even though Wake Forest allows you to repeat courses and remove the first attempt from your Wake Forest GPA, the first grade is still on your transcript. Also, when you calculate your GPA for your application to a health professions program, you will need to include all of the courses you have taken, even if you have repeated some of them. Repeated courses don't just go away. Your course grade will be an average of both attempts.

## **Help!**

If you are struggling in a course, take advantage of the resources that Wake Forest offers. Seek out advice from your course instructor or TA. Peer tutoring is available free of charge through the Learning Assistance Center. The LAC can also help with time management issues or study skills. If you need assistance in writing, visit the Writing Center. The Chemistry and Biology Centers, operated through the departments of Chemistry and Biology respectively, allows students to drop in and work with instructors and/or peers. The Math Department offers a similar service. Finally, don't forget that you have an academic advisor who may not be able to help you with your biology exam, but can give you sage academic advice on whether or not you should drop a course. If you find that you are really struggling academically and need assistance to stay on track, please see a counselor in the Office of Academic Advising.

## **Just say no**

There are so many things to do in college, many of which are unrelated to academics, that it is easy to become over-committed. While a variety of experiences makes for a well-rounded individual, spreading yourself too thin often means that you have many things on your resume, but have not excelled in any of them. Preparing for a career in a health profession does not preclude having a normal college experience. But always remember your goal, and make wise decisions on how to spend your time.

## **BECOMING A COMPETITIVE APPLICANT: COMMUNITY SERVICE**

As more schools adopt competency-based admissions and learning, service has become an even more important component of a student's application. Schools want to know that you have a true commitment to serve the community. One way that you can demonstrate this is by community service activities. These activities can be clinical, such as volunteering at the local hospital or clinic, but they do not have to be. There are many opportunities for service: working with the disabled, at a nursing home, tutoring at an underserved school, or helping out in the soup kitchen or homeless shelter, etc.

Community service is more than philanthropy through your fraternity or sorority. It involves actually getting out into the community and interacting with a diversity of people whose background may be different from your own. Your community service should be a learning opportunity for you.

**How much service is enough?** Most schools do not specify a specific number of hours that should be devoted to service, or how many different service experiences in which you should engage. However, some do. For example, Rush Medical College has a minimum requirement of 150 hours of community service plus 150 hours of healthcare exposure. If you are considering PA school, be aware that you will be required to have 1000-2000 hours of patient care time before applying. Most volunteer service activities don't count towards these hours.

It is better to show real commitment to a single service activity, rather than try to accumulate a number of service activities to which you have devoted just a few hours. It's not just about checking off the service box on your application. It is about truly making a difference and being able to communicate in what way the experience has changed you.

**When should you become involved in service?** It is never too soon. Once you have established yourself at college and are comfortable academically, it is time to start thinking about other experiences that will enrich your life, and thus make you a more competitive applicant. Summers are an ideal time to engage in service, particularly if you are not working at a job, but don't forget that it is important to maintain balance. Don't focus on service to the exclusion of other important parts of the college experience.

**How do you know where to volunteer?** A good start is at one of the local hospitals – Wake Forest Baptist Hospital, or Novant Health Forsyth Medical Center. Contact the volunteer coordinator. It often takes some time to get a volunteer position at the hospital, so contact them well before you hope to start.

The Wake Forest Volunteer Service Corps is a student-run organization whose mission is to serve the community by linking Wake Forest students, faculty and staff with service opportunities in the community. You can join the VSC and be a part of this effort, or take



advantage of the list they have of community partners who need volunteers. The list can be found at <http://vsc.groups.wfu.edu/off-campus-partners/>.

**What about mission trips?** Is that a good way to accumulate service experience? It depends. Choose your trip wisely. You don't want to go for a week to a developing country where you are either asked to be involved in medical procedures for which you are not trained, or that are simply opportunities to see another country with no meaningful service component (voluntourism). For advice on how to make the most of your clinical experience abroad without overstepping any ethical boundaries, visit the University of Minnesota free online workshop on *Global Ambassadors for Patient Safety* at <https://www.healthcareers.umn.edu/online-workshops>.

## **BECOMING A COMPETITIVE APPLICANT: SHADOWING AND CLINICAL EXPERIENCE**

If you are considering a career in a health profession, you should have experiences that demonstrate what it means to be, for example, a physical therapist or physician assistant, and that you are truly committed to helping those with medical problems. Some students may choose a career in the health professions because these careers are lucrative and offer abundant job opportunities in the future. However, a poor choice can mean that you will be unhappy in your career. Admissions committees are looking for students who demonstrate a sincere interest in, and are an appropriate match for their chosen career.

What counts as experience? Some programs accept shadowing, while others require hands-on patient contact. For example, shadowing a physician is recommended for medical school, but 1000 or more hours of direct patient contact is expected of an applicant for a physician assistant program. Once again, look at the program web sites of various schools to find out what the expectations are for clinical experience.

### **Finding an Internship or Relevant Employment**

Don't be intimidated! This is easier than you think. There are many opportunities out there; you just need some help finding out what and where they are. One opportunity for students interested in medicine is the Women in Medicine and Science/Health Professions Shadowing and Internship Program. This program matches Wake Undergraduates with physicians in the Wake Forest Baptist Health System. Applications are accepted twice a year. Students shadow two physicians, for half a semester each. The number of hours is variable. For more information, visit

<http://college.wfu.edu/prehealth/be-competitive/wake-forest-university-clinical-internshipshaking-program/>.

Another place to look for ideas is the Office of Personal and Career Development (OPCD) in Reynolda Hall. The minute you settle into your dorm, go to [career.opcd.wfu.edu/handshake/](http://career.opcd.wfu.edu/handshake/). Follow the login instructions, using your Wake Forest username and password to sign in. Fill out the profile at the top of the page, and select “Profile” from the left hand navigation. Add your work experience, extracurricular activities, and any special skills you may have. Then, click the account tab and specify the industry and job functions that interest you. Internships and jobs related to your selections will appear in your news feed, and you will receive notification of relevant events on campus. You’ll want to periodically update Handshake, and begin to check it frequently as summer or a gap year approaches and you are looking for the perfect internship or job.

Another great site to visit is <https://opcd.wfu.edu/explore-options/explore-careers/>, where you can find lists of opportunities under headings such as health professions, biology, chemistry, community and social services, international gap year opportunities, and public health.

Each spring the North Carolina Health Professions Fair comes to Wake Forest, organized by OPCD. Various schools in all disciplines send admissions representatives to recruit students.

OPCD also offers career fairs each year, where hundreds of companies interested in hiring Wake Forest students will be represented. These include the Fall Career Fair in September, and the STEM Slam Networking event in February (this is a particularly good one). Once you have comfortably reached your third year, a definite must is the November Graduate and Professional School Day, when representatives from many health professions programs will be in attendance. As you begin to think about specific programs, be sure to attend the March Health Professions Expo, where admissions officers from a diversity of programs at many schools will be present. This is a time to feel them out about whether or not you are a good fit for their program.

Finally, once you begin to think about an internship or job, make an appointment with an OPCD Career coach. They can help. Who to contact:

**Brian Mendenhall** ([mendenbh@wfu.edu](mailto:mendenbh@wfu.edu)) - specializes in the sciences and health professions.

**Patrick Sullivan** ([sullivpc@wfu.edu](mailto:sullivpc@wfu.edu)) – specializes in internships and experiential education.



## **BECOMING A COMPETITIVE APPLICANT: RESEARCH**

Many students ask whether they should be involved in research. Research is just one of the many ways that you can enrich your educational experience, and contribute towards making you a well-rounded person. It is an opportunity to get close to a faculty member, who can potentially write you a strong letter of recommendation.

Most students choose to do research in the sciences. However, you could choose instead to do research in the humanities or social sciences. Health professions schools do not expect that you will necessarily have done research in a lab; many successful candidates have not. If you choose to do research, do it because you care about the research question. Be sure that you are prepared to discuss the research knowledgeably in an interview.

### **Summer Programs for Research & Healthcare Experiences**

The WF URECA Center – The Undergraduate Research and Creative Activities Center (<http://college.wfu.edu/ureca/>) is a center that promotes undergraduate research and creative activities between Wake Forest faculty and students. Students can apply for research fellowships or Richter Fellowships to help fund their projects. There are also links to external opportunities for research on the URECA Center home page.

NSF REU summer research programs – Often researchers that get grants from the National Science Foundation (NSF) have funds to support student involvement in summer research programs. The program is called REU – Research Experience for Undergraduates. Programs can be found located in any part of the country. You can find information on REU programs at <http://www.nsf.gov/crssprgm/reu/>. Similar programs are sponsored by many universities.

### **Summer Undergraduate Research Programs at Wake Forest School of Medicine**

There are a number of summer research programs available through the School of Medicine. You can find information on these programs at <https://school.wakehealth.edu/Education-and-Training/Graduate-Programs/Summer-Undergraduate-Research-Programs>.

## **BECOMING A COMPETITIVE APPLICANT: THE GAP YEAR**

Balancing academics, preparing for the DAT, MCAT or GRE, shadowing, volunteering, and just being an all-around stellar person can be stressful. At times it may seem impossible. One of the best ways to accomplish what seems to be impossible is to spread the challenge over four years, rather than trying to do it all in three. In other words, apply for the program of your choice after four years of undergraduate education, not three. This allows another year for

clinical experience and volunteer activities, another year to bring that grade point into the competitive range and another year to prepare for the GRE, DAT or MCAT exam.

Even if you want to apply to medical or dental school after three years, you may not have the GPA or test scores or experiences to be competitive. So if you don't apply for a health professions school until you graduate, what do you do with the year between when you graduate and when you matriculate, the so-called "gap year"?

Use the gap year to gain valuable experience that sets you apart from the crowd. If you apply right after graduation, you will have just begun the gap year experience when you complete your applications. But when you get that call for an interview, you will have something that distinguishes you from the thousands of other qualified applicants (yes, thousands). You are no longer just another good student; you are now someone with additional maturity gained through experience, and someone with a story to tell.

There are many things that you can do to enhance your competitiveness. These include:

- Working in a job in a clinical field
- Participation in a service program such as the Peace Corps or Teach for America
- doing clinical or basic research
- earning a master's degree
- attending a post-baccalaureate program (next page)

If you decide to look for employment in the clinical or research sector, the first thing to do is to go to the **Office of Personal and Career Development (OPCD)**. Not only can they assist you with assembling a resume and working on your interviewing skills, they offer job fairs (including the STEM Slam which focuses on jobs in the sciences), they maintain a list of jobs available in relevant fields, and they have a list of alumni willing to assist our students in gaining experience and finding jobs. Make an appointment with a counselor in OPCD during your third year at the latest, and start preparing for that very valuable gap year.

Most students do not want to take a gap year, but for medical school it has become the new normal. Over 60% of students matriculating to medical school have had one or more gap years. The average age of matriculation to medical school is now nearly 25 years.

## BECOMING A COMPETITIVE APPLICANT: POST-BACCALAUREATE PROGRAMS

If you feel that in many respects you are competitive for medical, PA or PT school, but are being held back by a lack of preparation or poor performance in the sciences, one possible route to take is to complete a post-baccalaureate program. ***About 15% of the students entering medical school have completed a postbac program.*** There are over 100 such programs in the US, some at very prestigious institutions.

If you are considering a postbac program as a precursor to application to medical school, consider one that is linked to one or more medical schools, guaranteeing an interview based on achieving a specific level of performance in the program. The most important consideration in choosing a program is the school's acceptance rate of its students to medical school.

There are two types of postbac programs. The first is remedial; to establish a new academic record that demonstrates that a student can successfully work on a graduate level. The second is the "career changer." This type of postbac program is for students who came late to the idea of a health professions career, and need to take the necessary prerequisite courses.

The disadvantage of a postbac program is that tuition is comparable to that of college, but if you need to correct deficiencies in preparation or performance, this is an efficient way to do it. And folded into the cost of a professional education, it is worth the investment.

A list of postbac programs can be found at <https://apps.aamc.org/postbac/#/index> and <https://students-residents.aamc.org/postbacc/>. Please see your health professions advisor for more information on postbac programs.

Some good articles to look at that might help you decide if a postbac program is the best option for you:

<http://www.usnews.com/education/blogs/medical-school-admissions-doctor/2011/12/19/is-a-postbaccalaureate-medical-program-right-for-you>

[http://www.nytimes.com/2012/04/15/education/edlife/a-second-opinion-the-post-baccalaureate.html?\\_r=0](http://www.nytimes.com/2012/04/15/education/edlife/a-second-opinion-the-post-baccalaureate.html?_r=0)

**The Graduate School of Wake Forest University offers several master's programs for pre-medical/dental students designed to increase experience and make them more competitive for the program of their choice. These are:**

- 12 month option: Biomedical Science for Pre-Health Professions Master of Science (MS) – most of these students go on to successfully enter medical school

- 18 month option: Addiction Research and Clinical Health Master of Science (MS)
- 24 month option: Health Disparities in Neuroscience-related Disorders Master of Science (MS)

## BECOMING A COMPETITIVE APPLICANT: RESOURCES

The NAAHP (National Association of Advisors in the Health Professions) has a variety of resources for students applying to graduate programs in the health professions. These include the following brochures/books:

The Health Professions Admissions Guide provides detailed, up-to-date information on a variety of health professions. It begins with the initial questions students should ask when exploring these professions and continues through to the application process, giving helpful advice to increase chances of acceptance. Written and edited by a committee of experienced health professions advisors, and with the valuable contributions of the NAAHP Advisory Council members, the Health Professions Admissions Guide delineates a simple and effective strategy to approach the often complex process of applying to health professions schools.

Write for Success: Preparing a Successful Essay for Your Application to Health Professions School. This book is geared specifically to helping students write clearly for the tasks related to the health professions application process, including the personal statement. It includes examples of both successful and unsuccessful applications, critical reviews of actual applications by three admissions deans, and advice from the experiences of the authors. The importance of writing clearly must not be underestimated. Admissions committees report that factors other than GPA and entrance exam scores play a critical role in the evaluation process. One of the criteria mentioned repeatedly is the personal statement section of the health professional application.

Interview Brochure. This concise booklet provides a thorough overview of the interviewing process and the various steps that students can take to prepare well for it. It pulls together the experience of numerous advisors and the thoughts and suggestions of several health professions schools admission deans.

The University of Minnesota has wonderful free online workshops on *Planning for Medical School*, *Personal Statements for a Health Program*, and *Interviewing for a Health Program*. These can be accessed at <https://www.healthcareers.umn.edu/online-workshops>. They also have a valuable online workshop entitled *Global Ambassadors for Patient Safety* that explains how to make the most of mission-type clinical experiences without going beyond your qualifications or expertise.



## LETTERS OF RECOMMENDATION

Check with the program that you are applying to for guidelines on who to ask for letters of recommendation. Most programs require three letters of recommendation; some will accept more. Generally, at least one letter will need to be from a science professor, and another from an instructor in your major. The third letter might come from a professional in the field, someone that you have shadowed for example, who can speak directly to your ability to work with people (or with animals, for veterinary medicine). *The Health Professions Committee will accept only three letters of recommendation to forward to the medical or dental schools on your behalf. Additional letters must be submitted directly to the applications service.*

Start thinking about your letters at least a year before you need to request them. The letters need to be from someone who knows you beyond being able to say, “This student received an A in my class.” If the professor needs to ask your name, that is not the person to ask! A good letter will describe the letter writer’s relationship to you, address your potential to succeed in the program that you are applying for, and explain the reasons why he or she believes you will succeed. The more concrete examples that the letter writer can provide, the more weight the letter will carry.

How do you get to know a professor this well? Be an active participant in class. Ask and answer questions, contribute to class discussions. Meet with the professor outside of class. Take advantage of extra credit opportunities. Actively engage in service learning projects if the opportunity presents itself. An excellent way to get to know a professor better is to work with him or her on a research or honors project. But don’t sign on for research just so that a professor will know you! A lackluster commitment to research will likely result in an unenthusiastic letter.

Is a letter from a TA acceptable? Generally, letters from TAs are not considered useful. It is also not appropriate to get letters from employers out of the healthcare field, high school teachers or counselors, coaches, etc.

## THE PERSONAL STATEMENT

All program applications include essays, at least one of which is designed to better understand who you really are beyond your GPA and test score. The “personal statement” strikes fear in the hearts of students applying to medical, dental and physician assistant programs. Attend the workshops that will be offered each spring on preparing a personal statement. Look at

examples of personal statements from successful applicants. Seek help from the Office of Personal and Career Development (OPCD) and the Writing Center.

No one can tell you what to put in your personal statement. The whole point is that it is about you. It is your opportunity to communicate to the admissions committee what it is that sets you apart from the other applicants. Rather than a list of things that you have accomplished, it should show how you have reflected on the things that have had the greatest significance to you.

Avoid clichés. Do not say that you have wanted to be a doctor since you were ten years old and you broke your arm. Do not say that you want to help people. Do not say that you are kind and compassionate. You want to show, rather than tell, the admissions committee that you care.

The personal statement often takes the form of a story. You want to begin with something that catches the attention of the reader – perhaps a personal experience that moved you. What did you learn from this experience and how is it relevant to your career plans? Don't just say that you are committed to service. What has motivated you to serve? Are there any hardships that you have overcome that have influenced your decision to pursue a career in the health professions? Do you have relevant talents or skills that you would like to highlight that might not be clear in your application?

For advice on writing your personal statement, visit the free online workshop offered by the University of Minnesota at <https://www.healthcareers.umn.edu/online-workshops>.

Every spring The Health Professions Advising Program offers a workshop on writing a personal statement. This is an opportunity you should take advantage of!

## **USING THE OFFICE OF CAREER AND PROFESSIONAL DEVELOPMENT**

The OPCD offers workshops on writing a personal statement/admissions essay and how to find a relevant summer job/internships in the health professions. In addition, there are two opportunities you shouldn't miss – the first is assistance in preparing a resume. If you are looking for a summer job or internship, you will need to have a resume. The OPCD can help find the right format for you, and help guide you in terms of knowing what is or is not appropriate for a resume. Secondly, a wonderful service offered by the OCPD is the mock interview. Once you receive an invitation to interview for an internship, job, or health professions program, the OPCD will do a mock interview, designed to mimic the interview that you have scheduled. They know what questions you are likely to be asked, and can offer good advice on how to polish your interviewing skills. Reviews from students in past years have been very positive.

## **THE GRADUATE RECORD EXAM**

All of the health professions programs require that you take a standardized exam for admission. For many programs, it is the Graduate Record Exam. Advice for the GRE: Practice! Practice! Practice! It is possible that you have forgotten all the geometry you ever knew. Revive your math skills, and acquaint yourself with the expectations for the written part of the exam.

The exam is offered only on computer. You can take it at any time, by appointment, at designated testing centers.

Kaplan periodically offers practice GRE tests on campus at no cost. For further information on the GRE, visit the webpage of the Office of Career and Personal Development, and follow the link to Exploring Graduate Schools, and then to the GRE.

Students planning to pursue careers in medicine, dentistry and pharmacy take the MCAT, DAT, or PCAT, respectively.

## **UNDERGRADUATE HEALTH PROFESSIONS ORGANIZATIONS**

Alpha Epsilon Delta (AED) is the pre-medical honor society.

HOSA, Health Occupations Student Association, is for students interested in any career in the health professions.

The Allied Health Student Association is for students pursuing health professions other than medicine, dentistry and veterinary science.

The WFU Minority Association of Pre-Health Students, MAPS, has a purpose to provide underrepresented pre-medical students with knowledge, skills, and experiences that are associated with and necessary for professional participation in the medical field.

## **SCHOLARSHIPS**

### **Financial assistance for application to medical school**

The American Association of Medical Colleges (AAMC) Fee Assistance Program offers assistance not only for the MCAT exam and MCAT prep materials, but also for the cost of application. See the AAMC website FAQ for more information.

### **The Mackie Fund**

If you are already a recipient of financial aid or are on scholarship and are still enrolled at Wake Forest, you can apply to the Mackie Fund for up to \$500 to help offset the costs of applying to medical school. To request Mackie funds, write a letter of request to the Director of Health Professions Advising (gibsoncl@wfu.edu) and attach receipts for costs that have been incurred. Contact Dr. Gibson for further information.

### **Page Acree Humanities in the Sciences Scholarship**

Dr. Page Acree, a Wake Forest alumnus who helped pioneer open heart surgery, believed that potential physicians need a strong dose of the humanities to make them better physicians and citizens. To this end, he established a scholarship for pre-medical students.

The purpose of the Fund is to provide scholarship support for undergraduate students who are majors in Biology, Chemistry, Health & Exercise Science, Mathematics/Computer Science, or Physics, who have career objectives in medicine or science-related fields that require human service, and who also wish to take non-required academic work in the humanities.

The support is to enable the student(s) to enhance and increase their humanitarian and ethical awareness. Recipients must have an academic record that will make them likely to be admissible to a medical school. Students apply for the award by submitting a written description of his or her proposed study program in terms of content and objective, with particular reference to increasing their humanitarian and ethical awareness. Preference for funding will be for students who are currently juniors or seniors. Students may elect to:

1. take an extra semester or year of courses beyond graduation from college to concentrate on the humanities;
2. meet basic and divisional humanities requirements during summer sessions, thereby allowing non-required humanities courses (outside their major fields) during the regular semester; or
3. enroll for a semester in Wake Forest's London, Venice, or Vienna programs, or in any accredited university in the United States or the world. In all cases, students



must submit a written study program that will qualify for full academic credit at Wake Forest.”

In order to apply, please submit the following electronically to [prehealth@wfu.edu](mailto:prehealth@wfu.edu) by **February 20th**.

1. Details and a description of the content of the proposed study program
2. An itemized budget proposal
3. A copy of your transcript. A minimum grade point average of 3.5 is required.
4. One letter of recommendation.

Completed proposals should be submitted electronically as a Word document or pdf. The average budget of a successful Acree scholarship is in the range of \$5,000 to \$9,000. If published documentation (brochure or registration bulletin) is available about the program you plan to attend, please include that with your application. Students who apply will be notified of decisions by **March 15**.

Recipients obligate themselves to submitting a detailed report on completion of the program to the Dean of the College no later than one month after the program has ended.

### **Kirby Grant**

Through the Office of Career and Personal Development, the F.M. Kirby Foundation Access and Opportunity Endowment Fund awards a limited number of need-based grants and stipends that allow students to gain knowledge as well as experience during their career exploration. Useful to pre-health students is the Professional Development Grant, which covers expenses such as a professional wardrobe and accessories for interviewing! Students can apply for a grant for up to \$300. How to Apply: Visit the Kirby Grant page on the OPCD Website (<https://opcd.wfu.edu/get-ready/tools-for-connecting/grants-for-students/>). If you have any questions, please contact Ashley Graham Phipps at [phippasac@wfu.edu](mailto:phippasac@wfu.edu).

# **THE HEALTH PROFESSIONS**

**Audiology/Speech Pathology**

**Dentistry**

**Medicine**

**Nursing/ Nurse Practitioner/ Nurse Anesthetist**

**Occupational Therapy**

**Pharmacy**

**Physical Therapy**

**Physician Assistant**

**Veterinary Medicine**

## AUDIOLOGY/SPEECH PATHOLOGY

Speech pathologists diagnose, evaluate, and treat communication and swallowing disorders. For example, this would include working with patients who have speech difficulties following a stroke or brain injury, or working with children with delayed language development. Speech pathologists might be employed by public or private schools, hospitals, short and long-term care facilities, rehabilitation centers, government agencies, and community clinics.

It is possible to earn either a MS or PhD in speech pathology, or a doctorate in audiology (Au.D.). The MS degree is required for national certification, and enables one to practice as a speech pathologist. The PhD generally leads to an academic career, which may involve research in the field.

***Many programs have specific prerequisite courses that are not available at Wake Forest.***

There are also programs however, that will admit students with no previous coursework. There are a number of three-year programs that allow you to complete prerequisite courses while completing your graduate degree, and it is possible to take prerequisite courses online through Florida State and other schools. But before pursuing this option, be sure that the program you are applying to accepts online courses. Most programs will accept at least some online courses.

**Required courses.** Requirements vary by program. But many programs require the following:

Interpersonal communication

Linguistics

Biology (2 semesters, excluding Bio 101)

Chemistry (2 semesters)

Physics (2 semesters)

Human Anatomy and Physiology (two separate HES courses at WF)

Developmental Psychology

Statistics (can be taken in any department)

Wake Forest offers a minor in linguistics. Linguistics is the scientific study of human language, how words are formed and organized, and their meanings. **Any student wishing to study speech pathology should consider the linguistics minor.**

**Also recommended:** Courses in Math, Counseling and Education.

**Graduate Record Exam (GRE):** The general test is required.

**Years of post-graduate education required:** The MS program in speech pathology is generally 2-3 years. The PhD program is another 2-3 years.

## DENTISTRY

***The first thing to do if you are planning to apply to dental school is to read every word of the American Dental Education Association “Go Dental” site.***

**<http://www.adea.org/godental/>**

***Secondly, make an appointment with the Health Professions Dental Advisor (Dr. Katy Lack - [lackak@wfu.edu](mailto:lackak@wfu.edu)).***

The process of applying to dental school is much like that of applying to medical school. The coursework needed and the application process are very similar. Dental schools are also very competitive. The courses required (which may vary by program) are laid out below. As is the case for students applying to medical school, you will need to have not only a competitive GPA and test scores, but you are expected to have shadowed one or more dentists and have relevant clinical experience, as well as having demonstrated a commitment to service. Please read the introductory sections of this Handbook.

***Due to changes in the curriculum, there is a different course plan for students who entered prior to 2019.***

***Coursework - this course plan only applies for students entering in 2019 or later***

Most students apply to dental school in the summer between their third and fourth years of undergraduate study. It does not matter what major you choose; only that you complete the prerequisite courses.

In order to be competitive for admission after three years, a student may want to follow this plan:

| Fall year 1           | Spring year 1          | Fall year 2            | Spring year 2 | Fall year 3 | Spring year 3                | Summer Year 3          | Fall year 4                    | Spring Year 4                  |
|-----------------------|------------------------|------------------------|---------------|-------------|------------------------------|------------------------|--------------------------------|--------------------------------|
| CHM 111/L<br>MTH 111? | CHM 122/L<br>BIO 150/L | CHM 223/L<br>BIO 160/L | CHM 280/L     | PHY 113/L   | PHY 114/L<br>Prepare for DAT | Apply to dental school | Complete divisionals and major | Complete divisionals and major |



## **What to Major in**

64% of dental school applicants major in biology or biomedical sciences, and another 3% in other health-related areas. However, the rate of acceptance to dental school is not higher for students majoring in biology or biomedical sciences than the rate of acceptance of students majoring in other fields. The remainder of applicants are drawn for other fields such as social science, engineering, and business.

## **APPLYING TO DENTAL SCHOOL**

### **The Health Professions Committee Application and Letter**

Dental schools ask for a letter from the students' undergraduate institution(s) that expresses the degree of institutional support for the student's application and an explanation of that support. This is the Health Professions Committee (HPC) letter.

**In the fall of the year in which you plan to apply to dental school, you must attend one of the mandatory meetings held in the fall designed to prepare students for the HPC letter and dental school application processes.**

The Health Professions Committee will only write letters for students whose application they can support. It is important to note that you do not have to have a Health Professions Committee (HPC) letter to apply to medical or dental school. But generally, the lack of a committee letter indicates that your undergraduate institution could not strongly support your application.

### **The Process**

In February of the year you plan to apply to dental school, fill out the FERPA waiver form and provide the names of the individuals who will write your letters of recommendation. The letters will be sent to the HPC, who will forward them to the application service. The letter writers will receive an e-mail giving them instructions for writing and submitting their letter of recommendation to the Committee and information on whether you have or have not waived your right of access to the individual and HPC letters.

The committee will review your letters of recommendation, and HPC application. The HPC application will detail your community service, clinical experiences, shadowing hours, and research.

By April 30, all of the materials for the Health Professions Committee letter application must be completed. The committee will review your materials which include essays, letters of recommendation, and your academic transcript(s).

**In order to write a strong letter of support, the Committee needs to know you. Therefore, it is important that you have an interview with the Director of Health Professions in the spring preceding your application to dental school.**

If you plan to apply to dental school one year or more after graduation, it is a good idea to go through the process now. Your application and letters can be updated at a later date if you wish.

## **veCollect**

Beginning in the academic year Fall 2019-Spring 2020, the Wake Forest Health Professions Office will begin implementing the use of a program designed to meet the needs of health professions students and their advisors. The program, veCollect, will replace the previous program AdviseStream/Inspire.

Students preparing to apply to medical (or dental) school will be required to create a veCollect account the year they apply. Students will request their letters of recommendation on veCollect and submit their HPC Application to [prehealth@wfu.edu](mailto:prehealth@wfu.edu). A link to VeCollect and an authorization code, plus the HPC Application template, will be available on the website in January.

## **Requesting a Health Professions Committee Letter**

Begin the process of requesting a Health Professions Committee letter on February 15th. Enter into VeCollect the names and contact information of four people who will be writing letters of recommendation for you and fill out the FERPA waiver form. By April 30 complete the committee letter application that can be found on the Prehealth website. In May, the Health Professions Committee will review your application, letters of recommendation and academic record, and a Health Professions Committee letter will be prepared on your behalf.

## **The DAT**

The DAT is an exam prepared by the American Dental Association. It is required by all US and many Canadian dental schools. The exam covers natural sciences, perceptual ability, reading comprehension and quantitative reasoning.

What is the best time to take the DAT? Any time after you have completed the prerequisite coursework. Since physics is not tested on the DAT, it is possible to take it as early as the

summer after your second year. But be sure to allow adequate time to study. You can take the exam as late as spring of the year in which you intend to apply.

For more information about preparing for and taking the DAT, visit the ADA's DAT website:

[www.ada.org/en/education-careers/dental-admission-test/](http://www.ada.org/en/education-careers/dental-admission-test/).

## The Dental School Application Process

Remember to first read the ADEA's "Go Dental site"!

<http://www.adea.org/godental/>

ADEA offers an official guide to dental school which contains information on how to apply, where to apply, and financing your education. It also has information on every dental school in the US, including statistics on admissions.

As the time to apply approaches, visit the American Dental Association **Pre-dental Student Virtual Fair**. It offers a free online opportunity to communicate directly with dental school admissions officers about the admissions process.

<http://www.adea.org/predentalvirtualfair>

You will want to begin the process of application to dental school about **18 months before you plan to matriculate**, typically in the middle of your third or fourth year.

Early in the fall semester of your third year, make an appointment with the Director of Health Professions Advising to discuss your progress towards applying to dental school.

You will also want to make an appointment for an interview with the Director of Health Professions Advising in the spring of the semester before you plan to apply to dental school. The interview is important for the preparation of the Health Professions Committee letter. You will be asked to reflect on your relevant experiences, explain your motivation for a health professions career, and discuss the strengths and weaknesses of your inter- and intra-personal skills. Information from the interview will be used in preparing your HPC letter to the medical schools.

Some time between the end of your second and third years, you will take the DAT (Dental Admission Test). (Although Physics is required for dental school, it is not tested on the DAT.)

The DAT is a computer-based test which can be taken at almost any time at testing centers throughout the country. You can find information on the DAT at the American Dental Association site:

<http://www.ada.org/en/education-careers/dental-admission-test/>.

The DAT is scored on a scale of 0-30. A score of 21 is in the top 10%.

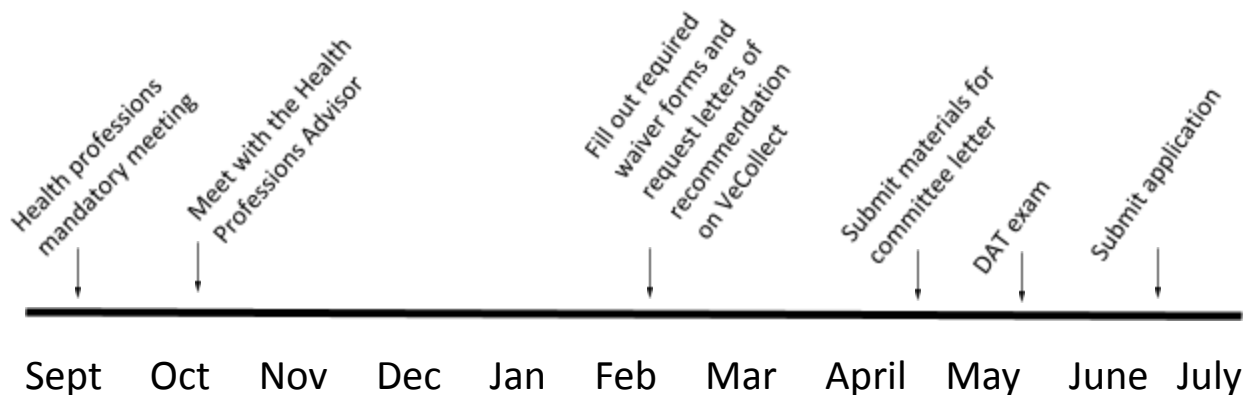
By February 15<sup>th</sup> of your third year, you will want to request four letters of recommendation (one from a dentist) and fill out and submit the required waiver forms on VeCollect.

All US dental schools participate in the ADEA (American Dental Education Association) AADSAS (Associated American Dental School Application Service) centralized application service. The letters of recommendation will be submitted to the Health Professions Committee on VeCollect, which will forward them to the AADSAS.

During the spring, you should research dental schools and establish the ones to which you will apply. Work on your personal statement. Attend the spring workshop offered by the Health Professions Committee and the OPCD on how to write an admissions essay/personal statement.

Complete the ADEA AADSAS application early. The verification process can take up to six weeks.

### Dentistry Application Timeline





## MEDICINE

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## MEDICINE: Courses

For additional useful information, please visit the AMCAS Tools and Tutorials site

<https://students-residents.aamc.org/applying-medical-school/applying-medical-school-process/applying-medical-school-amcas/amcas-tools-and-tutorials/>

These are the courses required by most medical schools:

1. Four semesters of chemistry. At Wake Forest those courses are CHM 111 (general chemistry I), CHM 122 or 123 (organic chemistry I), CHM 223 (organic chemistry II) and CHM 280 (general chemistry II). Most students take the courses in that order; in other words, general chemistry 2 is the last course taken. Please be aware that these courses are only offered in one semester of each academic year, so if you skip a semester, you will need to either take the course in the summer, or wait a year to take it.
2. Two semesters of biology, BIO 150 and 160. However, these courses do not cover all of the biology content cover that is on the MCAT exam. Also recommended are HES 350 (Human Physiology) and a course in cell and molecular biology.  
  
Bio 150 and 160 are offered every semester, but not every summer.
3. Two semesters of physics. The physics offered at Wake Forest is calculus-based. Some medical schools recommend calculus, and since it is a prerequisite for PHY 113 and 114, you should plan to take it if you do not have AP credit for it.
4. Social science. At least one social science, such as psychology, anthropology, or sociology is recommended. Two or more would be better.
5. Biochemistry. This course can be taken through either the Biology or Chemistry Departments. You can use the credits for both the Biology and Chemistry majors and minors (it counts towards both).
6. Statistics. Recommended by many but not all medical schools.
7. English. Two semesters of English are required by some but not all medical schools.

These are the traditional requirements. However, there is a movement among medical schools towards what is called “competency-based” admissions, which has been recommended by the Association of American Medical Colleges (AAMC), in collaboration with the Howard Hughes Medical Institute (HHMI). These recommendations have resulted in some medical schools reassessing and becoming more flexible about admissions requirements. Medical schools are

trying to identify students based on a more holistic approach, one that recognizes Interpersonal and Intrapersonal competencies. These competencies are listed below.

| Interpersonal Competencies      | Intrapersonal competencies    |
|---------------------------------|-------------------------------|
| Service orientation             | Integrity and Ethics          |
| Social and interpersonal skills | Reliability and Dependability |
| Cultural competence             | Resilience and adaptability   |
| Team work                       | Capacity for improvement      |
| Oral communication              |                               |

Despite the increased emphasis on competencies, most schools still require the traditional prerequisite coursework, and the content of these courses is covered on the MCAT exam. Most pre-medical students apply to ten or more medical schools, so it is very likely that one of the schools that you apply to will still require these courses. Also, the material covered in these courses is covered on the MCAT exam, a standardized test required for admission to almost all medical schools.

### **MEDICINE: Course Plans (*Plans only apply for students entering in 2019 or later*)**

Your goal is to be accepted to medical school. In order to do that, you need to be the most competitive applicant that you can be. In 2018, Wake Forest School of Medicine had over 11,000 applications for 130 spots in the entering class. Of these, only 450 received interviews, and about half this number was accepted. The point is clear. You need to rise to the top of that pile of applications. Here are some important statistics:

- **In the 2018 application cycle, the average GPA for students admitted to allopathic medical school was 3.71; to osteopathic medical school, 3.6.**
- **In the 2018 application cycle, the average MCAT score was over 511.**
- **The average age of students entering medical school is just under 25 years. According to the American Association of Medical Colleges, more than 60% of matriculants to medical school now have had one or more gap years.**

It is possible to complete all of the courses required to apply for medical school and take the MCAT exam in the first three years of college. In your spare time you need to shadow physicians, consistently participate in community service, and acquire some clinical experience. This is a

Herculean task. Many students see this as the only option, but in fact many prestigious schools have designed pre-medical programs that use the full four years of college to prepare their students for admission to medical school. These include Duke, Davidson, and Princeton. Other schools also recommend that students complete college before applying. These students take a “gap year” between graduation and matriculation to medical school.

What are the advantages of applying to medical school at the end of four years, as opposed to three? Medical schools are looking for students who have demonstrated that not only are they good students, but that they are committed to service and have a breadth of life experiences. Every year, you will become more mature and have more life experiences that will make you a more competitive applicant. Some advantages to the four-year plan are as follows:

- You do not have to squeeze all of the prerequisite courses into three years. Many of the prerequisite courses are very challenging, and if you do not try to take them all at once, you are likely to do better in them. Your GPA is an important factor in consideration by medical schools.
- Your senior year grades will be included in the consideration for medical school. In the fourth year, you will be taking mostly courses in your major and elective courses, in which students generally do very well. This is an opportunity to maximize your GPA.
- You will have the opportunity to study abroad. Studying abroad is one of the greatest growth experiences that you can have as an undergraduate. Where you choose to study abroad, how you use that time, and how it has changed you are assets when writing a personal statement for or interviewing for medical school.
- You have more time for service activities and shadowing.
- If you use your gap year wisely, you will be engaged in an activity which enhances your competitiveness for medical school and that can help you “rise to the top” in the interviewing process.
- Not trying to do it all at once allows you to take advantage of all of the amazing opportunities that college offers. **Medical schools are not simply looking for the best students. They are looking for the best people** (who happen to be good students). With the movement towards a more holistic view of admissions and medical education, that final year in college gives you the opportunity to develop more as a person.

If you have a grade point average of 3.85, have had your poetry published in a national magazine, have won awards for service, and climbed Mount Everest, you should consider

applying after your third year. Otherwise, give serious consideration to taking the full four years to make yourself the most competitive applicant you can be.

Below are some options for how you might plan your science courses. You would work basic and divisional courses and major courses around these courses.

**An option for students who do not plan to major in biology, chemistry, or physics**

| Fall year 1 | Spring year 1             | Fall year 2               | Spring year 2             | Fall year 3   | Spring year 3                     | Fall year 4                   | Spring year 4                                       | Right after graduation  |
|-------------|---------------------------|---------------------------|---------------------------|---------------|-----------------------------------|-------------------------------|---|-------------------------|
| *CHM 111/L  | CHM 122/L<br><br>MTH 111? | CHM 223/L<br><br>BIO150/L | CHM 280/L<br><br>BIO160/L | Study abroad? | BIO 370 or CHM 370<br><br>HES 350 | PHY 113/L<br><br>Cell biology | PHY 114/L<br><br>Prepare for and take the MCAT exam | Apply to medical school |

Basic and divisional courses and courses in the major can be easily worked into this schedule. Study abroad can be done on either fall or spring of the junior year.

**For students who place into CHM 123\***

| Fall year 1 | Spring year 1            | Fall year 2 | Spring year 2            | Fall year 3   | Spring year 3                          | Fall year 4 | Spring year 4                           | Right after graduation  |
|-------------|--------------------------|-------------|--------------------------|---------------|--|-------------|---|-------------------------|
| *CHM 123/L  | BIO 150<br><br>CHM 223/L | BIO 160     | CHM 280/L<br><br>HES 350 | Study abroad? | BIO 370 or CHM 370<br><br>cell biology | *PHY 113/L  | *PHY 114/L<br><br>Prepare for MCAT exam | Apply to medical school |

*\*Students who select certain concentrations in the Chemistry or Biochemistry and Molecular Biology (BMB) majors need to take Physical Chemistry, which is only offered in the fall. This means that they will need to take at least one course in physics in the summer in order to spend a semester abroad.*

## For students who are considering the biology or chemistry major

As a major in any of the sciences, you will have numerous semesters in which you will be taking two science lab courses, and three science courses. But if you plan to major in a science, this is your strength, so it should not be a problem. Plus, your first years of medical school are very science-heavy, so this is a good warm up!

| Fall year 1                                | Spring year 1            | Fall year 2              | Spring year 2 | Fall year 3   | Spring year 3 | Fall year 4 | Spring year 4                          | Right after graduation   |
|--|--------------------------|--------------------------|---------------|---------------|---------------|-------------|--|--------------------------|
| CHM 111/L<br>Or<br>CHM123/L<br><br>Bio 150 | CHM 122/L<br><br>BIO 160 | CHM 223/L<br><br>HES 350 | CHM 280/L     | Study abroad? | Biochemistry  | *PHY 113/L  | PHY 114/L<br><br>Prepare for MCAT exam | Apply to medical school! |

*\*Students who select certain concentrations in the Chemistry or Biochemistry and Molecular Biology (BMB) majors need to take Physical Chemistry, which is only offered in the fall. This means that they will need to take at least one course in physics in the summer in order to spend a semester abroad.*

## For students considering a major in physics

Once again, if you are strong in science and are considering a major in physics, multiple labs in one semester will play to your strengths.

| Fall year 1                               | Spring year 1                             | Fall year 2                     | Spring year 2                                | Fall year 3   | Spring year 3 | Fall year 4                 | Spring year 4  | Right after graduation   |
|---|---|---------------------------------|--|---------------|---------------|-----------------------------|--|--------------------------|
| CHM 111/L<br><br>MTH 111<br><br>PHY 113/L | CHM 122/L<br><br>MTH 112<br><br>PHY 114/L | CHM 223/L<br>PHY 215<br>MTH 205 | CHM 280/L<br>BIO 150/L<br>PHY 262<br>PHY 230 | Study abroad? | BIO 160/L     | HES 350<br><br>cell biology | BIO 370 or CHM 370<br><br>Prepare for and take the MCAT exam | Apply to medical school! |



## THE THREE-YEAR PLAN:

There is of course the option of the three-year plan. Remember, with this plan you will have to double up on lab sciences more often, will not have time to study abroad during the academic year unless you take physics during the summer, and you will have less time for service, shadowing, and other experiences that will make you a more competitive applicant. However, if you are an outstanding student who at the end of the sophomore year has a GPA of 3.7 overall and at least a 3.5 in the sciences, and if you have considerable shadowing and community service experience, applying to medical school after the third year is a good option.

| Fall year 1 | Spring year 1              | Fall year 2                | Spring year 2              | Fall year 3                   | Spring year 3                     | Summer year 3           | Fall year 4                    | Spring year 4                  |
|-------------|----------------------------|----------------------------|----------------------------|-------------------------------|-----------------------------------|-------------------------|--------------------------------|--------------------------------|
| CHM 111/L   | CHM 122/L<br><br>BIO 150/L | CHM 223/L<br><br>BIO 160/L | CHM 280/L<br><br>HES 350/L | PHY 113/L<br><br>Biochemistry | PHY 114/L<br><br>Prepare for MCAT | Apply to medical school | Complete divisionals and major | Complete divisionals and major |

## MEDICINE: Choosing a Major

At the end of your second year, you will choose a major. There is no particular major that will make you more competitive for medical school. You will learn what you need to know to be a physician once you get to medical school. Medical Schools clearly delineate their prerequisite courses. After that, you're on your own.

A double major in chemistry and biology has no more value than a double major in Art and Philosophy, and a double major does not have any greater value than a major and a single minor. ***What is most important is that you are good at what you do.*** Major in what you feel most passionate about. If you love the subject, you will do better academically, and you will enjoy your time in college more.

Medical Schools are looking for broadly educated students. At Wake Forest, it is hard NOT to be broadly educated! Consider the Divisional Courses as a shopping expedition to find out what it is that you want to know more about. ***What is most important is that, once you have chosen your major, whatever it is, excel in it.***

## MEDICINE: The Application Process

### How do I know if I am ready to apply to medical school?

You should apply to medical school once you feel that you are a competitive applicant. Remember that the average age of matriculation to medical school is over 24 years. When are you ready? That could be during or after your college career. Different people take different paths to medicine, but once you decide to apply, you need to be organized. Make a schedule and stick to it.

There are many factors taken into consideration when reviewing candidates for admission to medical school, but the only objective data available is on GPA and MCAT scores.

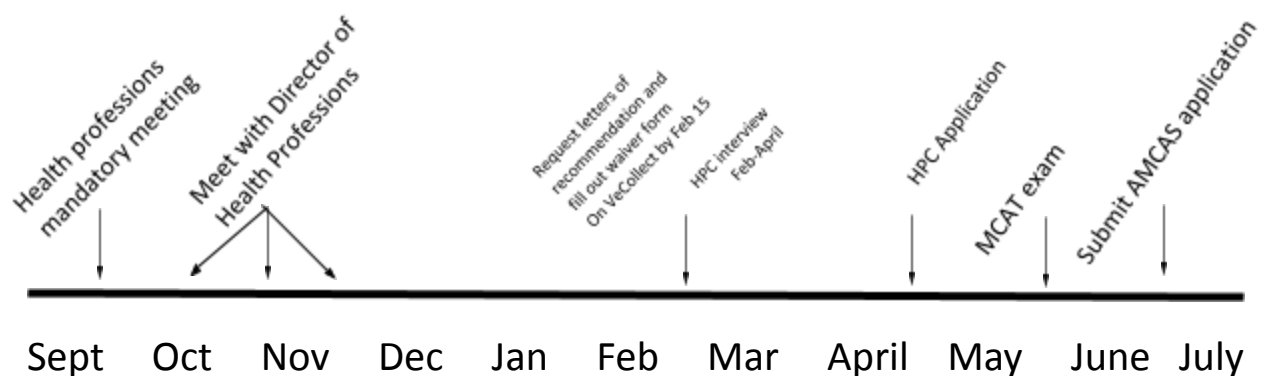
Data provided by the American Association of Medical Colleges on the entering class of **2018** was as follows:

|                                | Average MCAT score | Mean GPA | Mean science GPA |
|--------------------------------|--------------------|----------|------------------|
| Matriculated to medical school | 511.2              | 3.72     | 3.65             |

Admission to medical school is very competitive. In 2018, nationally 52,777 students applied to schools of allopathic medicine, and 21,622 matriculated (40.1%).

### When to Apply: Application Timeline

Applying to health profession schools takes time. One way to increase your chances of admission is to apply early in the process. Most health profession schools have rolling admissions. Applications begin to be reviewed in early July or August. The earlier you apply, the more likely you are to get an interview.



**September** - Attend ONE of the mandatory meetings in which the Health Professions Committee review process will be explained. This is only for students applying to medical school the following summer. Schedule an interview with the Director of Health Professions.

**September to December** – meet with Director of Health Professions for advising.

**January – June** Take the MCAT exam, the standardized test required for application to medical school. The earlier you take the exam, the more time you have to prepare to take it again, if necessary.

**February-April** Have an interview with the Director of Health Professions Advising.

**February 15** – Request THREE letters of recommendation (see section on “letters of recommendation” and fill out the required waiver forms on VeCollect). The letter writers will receive an e-mail giving them instructions for writing and submitting their letter of recommendation to the Committee, and information on whether you have or have not waived your right of access to the individual and committee letters.

Your letters of recommendation will be forwarded to AMCAS or other application services, as requested.

**April 30** - Deadline for completion of the HPC Application: committee letter essays, personal statement, and transcript submission. Timely completion of required materials is necessary to have an HPC letter sent on your behalf.

**May 1** - Start the on-line AMCAS application.

**May – June** Send AMCAS letter request pdf to Director of Health Professions Advising.

**June 1** – Submit your on-line AMCAS application.

**July** – Once your centralized application is submitted and reviewed by the schools you have applied to, you will receive secondary or supplementary applications. Complete them as soon as possible, to enhance your chances of getting an interview.

### **The Health Professions Committee (HPC) Letter**

Medical and dental schools ask for a letter from the students’ undergraduate institution(s) that expresses the degree of institutional support for the student’s application and an explanation of that support. This is the Health Professions Committee (HPC) letter.

**In the fall of the year in which you plan to apply to medical or dental school you must attend one of the mandatory meetings held in the fall designed to prepare students for the HPC letter and medical/dental school application processes.**

The Health Professions Committee will only write letters for students whose application they can support. *Except in exceptional circumstances, the Health Professions Committee cannot write a strong letter for a student whose overall or science GPA falls below 3.4.*

Students who have serious honor or judicial violations also will not receive a health professions committee letter. In some circumstances, a letter will be written, but will contain a reference to the violation.

It is important to note that you do not have to have an HPC letter to apply to medical or dental school. But generally, the lack of a committee letter indicates that your undergraduate institution could not strongly support your application. However, medical schools expect an HPC letter if your school offers one.

The HPC is composed of eight faculty from different disciplines. The members of the HPC are listed in the front of the handbook. All the members of the committee have experience in health professions advising.

In May, the health professions committee will review your letters of recommendation, and academic record as well as review your record of community service, clinical experiences, shadowing hours, and research experience. A level of support for your application will be assigned by the committee. The committee ranks all the candidates into one of five categories: highest confidence, high confidence, good confidence, confidence, and no letter. The committee will not write a letter for a student that it cannot be confident will successfully complete medical school and/or be an excellent physician.

To rank the students, the HPC uses a rubric which assesses the GPA and evaluates the characteristics used by the medical schools in the admissions process. The rubric can be found on the next page.

It is essential that you meet the assigned deadlines to guarantee that your committee letter reach the medical schools in a timely fashion. Medical schools have a rolling admissions policy, and it is important that you take these deadlines seriously.

**In order to write a strong letter of support, the Committee needs to know you. Therefore, it is important that you have an interview with the Director of Health Professions in the fall and again in the spring preceding your application to medical or dental school.**

## **Requesting a Health Professions Committee Letter**

Begin the process of requesting a Health Professions Committee letter on February 15th. Enter into VeCollect the names and contact information of three people who will be writing letters of recommendation for you and fill out FERPA waiver form. By April 30 complete the committee letter application that can be found on the Prehealth website. In May, the Health Professions

Committee will review your application, letters of recommendation and academic record, and a Health Professions Committee letter will be prepared on your behalf.

If you plan to apply to medical or dental school one year or more after graduation, it is a good idea to go through the HPC process before graduation. Your application and letters can be updated at a later date if you wish.

Students applying to allopathic medical schools should forward their AMCAS ID letter request to [prehealth@wfu.edu](mailto:prehealth@wfu.edu) by mid-May. You will have access to the letter request ID when you open the AMCAS application. Your application does not have to be complete to submit the letter request to the HPC.

The letter request is necessary for the Health Profession Committee to upload your letters to the AMCAS site.

Students applying to schools of osteopathic medicine will include the name and e-mail address of the Director of Health Professions on the AACOMAS application (Carole Gibson, [gibsoncl@wfu.edu](mailto:gibsoncl@wfu.edu)), and AACOMAS will request the letter from the College. Dental schools also request the committee letter directly from the College.

## **VeCollect**

Beginning in the academic year Fall 2019-Spring 2020, the Wake Forest Health Professions Office will begin implementing the use of a program designed to meet the needs of health professions students and their advisors. The program, veCollect, will replace the previous program AdviseStream/Inspire.

Students preparing to apply to medical (or dental) school will be required to create a veCollect account the year they apply. Students will request their letters of recommendation on veCollect and submit their HPC Application to [prehealth@wfu.edu](mailto:prehealth@wfu.edu). A link to VeCollect and an authorization code, plus the HPC Application template, will be available on the website in January.

# The Health Professions Rubric

2019 Scoring Rubric - Health Professions Application

Student Name

| SCORE  | 1 point - weak   | 2 points - fair  | 3 points - good  | 4 points - excellent   | 5 points - outstanding  |
|--|--|--|--|--|---|
| Overall Undergraduate GPA  | <3.2   | 3.2-3.39   | 3.4-3.59   | 3.6-3.79   | 3.8-4.0   |
| Undergraduate Science GPA  | <3.2   | 3.2-3.39   | 3.4-3.59   | 3.6-3.79   | 3.8-4.0   |
| Graduate study   |  | MS/PhD in Progress   | MS Completed   |  | PhD Completed   |
| Graduate GPA   |  | 3.8-4.0  |  |  |   |
| Scholarship in chosen field of study   | No research experience<br>Not interested in research   | Lab technician, volunteer<br>but no independent research   | One semester of independent research<br>General ability to discuss research<br>Non-competitive summer research program   | At least one year of independent research or summer research program (REU, Wake Forest URECA, etc.)<br>Can discuss research knowledgeably                        | More than one year of research<br>Thesis or graduation with distinction<br>Papers or presentation<br>Understand applications of research, has contributed significantly to the project<br>Has received URECA or REU fellowship<br><b>Bonus point for first author publication</b> |
| Letters of recommendation  |  | one of more weak letters   | moderately strong letters  | strong letters   | very strong letters   |
| Knowledge of and commitment to medicine  | No shadowing<br>No patient contact<br>Missed opportunities<br>Unfamiliar with medical issues or education<br>Not able to articulate a reason for choosing a medical career | Minimal patient contact<br>Describes experiences only in a vague way<br>Shadowed only family members<br>Activities are motivated by necessity to have for application ("jumped through the hoops") | 1 shadowing experience (<20 hrs)<br>Volunteered only in year of application<br>Realistic expectations<br>Can describe at least one patient interaction<br>Understands healthcare issues somewhat | Several shadowing experiences (>20 hrs)<br>At least 80 hours clinical experience<br>Can describe patient interactions in detail<br>Understands healthcare issues | Sustained deep shadowing experience (>150 hrs)<br>Finds opportunities independently<br>Extremely well informed on healthcare issues   |
| Community service and leadership   | No evidence of concern for others<br>No involvement in community organizations<br>No participation in organizations  | Passive, such as fundraising through frat or sorority<br>High school only<br>Participates in a few organizations, or scattered participation   | Occasional service, but short-term duration<br>No diversity experience<br>Good, focused participation, but no leadership   | Active role in several service activities (<2 years)<br>Works with people from diverse backgrounds<br>Some leadership<br>Active participation                    | Strong empathy, active role in community service experience<br>Long-term commitments (>2 yrs)<br>Significant leadership roles<br>Outstanding extracurricular activities, exhibits strong leadership   |
| Life experience after graduation (scribing or other relevant employment, research, etc.) | 1 year relevant experience   | 2 years relevant experience  | 3 years relevant experience  |  |   |
| Bonus point(s)   | Positive trajectory in GPA, strong, well-written personal statement, 1 <sup>st</sup> generation English as a 2 <sup>nd</sup> language                                      |  |  |  |   |
| TOTAL POINTS   |  |  |  |  |   |

Scoring rubric used by the Health Professions Committee to evaluate pre-medical and pre-dental applicants for the HPC letter



## The Health Professions Interview

The interview gives you the opportunity to reflect on your relevant experiences, explain your motivation for a health professions career, and discuss the strengths and weaknesses of your inter- and intra-personal skills. Information from the interview will be used in preparing your HPC letter to the medical schools.

## The MCAT Exam

The MCAT (Medical College Admission Test) is a standardized test administered by the American Association of Medical Colleges. It is required for application for nearly all allopathic and osteopathic medical schools. Information on the MCAT and registration for the exam is at <https://students-residents.aamc.org/applying-medical-school/taking-mcat-exam/>. There, you can find *The MCAT Essentials* guidebook with detailed instructions on preparing for and taking the test, and interpreting your scores.

The MCAT exam has four sections: Biological and Biochemical Foundations of Living Systems, Chemical and Physical Foundations of Biological Systems, Psychological, Social, and Biological Foundations of Behavior, and Critical Analysis and Reasoning Skills. It is an arduous exam, lasting seven and a half hours.

The exam is very comprehensive, so allow a significant amount of time for review of the material. Do not take a heavy credit load in the semester in which you are preparing for the exam. Make a study schedule, and stick to it.

Many medical schools do not like to see multiple attempts at the MCAT. While there are some schools that prefer that students only take the MCAT once, most have no bias against a second attempt as long as the scores improve significantly on the second attempt. If you take the MCAT a second time, both scores are forwarded to the medical schools. Some schools count the highest score; some average the two scores.

If you are not accepted upon your first application to medical school and plan to reapply, it may be necessary to retake the MCAT (after proper preparation) if your scores are borderline.

The American Association of Medical Colleges (AAMC), the organization that produces the MCAT exam, offers The Official Guide for the MCAT exam, an overview of the new exam accompanied by practice questions and solutions.

Other MCAT practice materials developed by AAMC are available at <https://students-residents.aamc.org/mcatprep>. Take advantage of this resource – these are the people that make up the MCAT exam, so they are the experts! The AAMC offers practice exams,

question packs, and flashcards for studying. AAMC has partnered with Khan Academy to offer the Khan Academy MCAT collection of videos and questions.

You can't take too many practice exams. You will get more comfortable with the test format and discover what areas you need to review more extensively. There are many review books and practice tests available at bookstores or through Amazon. If you find that you need more discipline in preparing for the exam, you can take a test prep course such as is offered by Kaplan and Princeton Review.

### **When to take the MCAT exam**

It is wisest to take the MCAT no later than May of the summer in which you plan to apply. Many schools have rolling admissions, and taking the exam later in the summer delays completion of your application.

It takes 30 days for the MCAT scores to be processed.

### **Fee assistance for MCAT**

AAMC offers a Fee Assistance Program for students with financial need. Fee assistance covers most of the cost of the MCAT exam, significant discounts on AAMC test prep materials, and assistance with the AMCAS application fee.

### **Should I repeat the MCAT?**

Some medical schools do not like to see a second attempt at the MCAT. Those schools that are open to a second attempt want to see significant improvement on the second attempt. Some schools do not look at the highest score; instead they average the scores. The best policy is to not take the exam until you are ready, and to do well on your first attempt.

### **How long is my MCAT score good for?**

Schools will generally accept the MCAT for three years after it has been taken; some schools allow four years. AAMC has a chart that you can access online that details this information by school.

### **The AMCAS Application**

AMCAS is the centralized application process that allows you to apply to all US medical schools (except for those in the state of Texas, which has its own application processing service). Instructions for applying to medical school can be found online in the AMCAS instruction manual. It is never too early to download the manual, and begin to understand the process.

## NAAHP Fact Sheet

|                                  |   |
|----------------------------------|---|
| <b>Association</b>               | Association of American Medical Colleges<br><a href="http://www.aamc.org">www.aamc.org</a>  |
| <b>Number of Schools</b>         | Most medical schools participate in AMCAS. The only exception is Texas Tech University Health Sciences Center, El Paso, Paul L. Foster School of Medicine. 6 Texas schools use AMCAS only for M.D.-Ph.D. application.   |
| <b>Contact Information</b>       | Applicant Contact:<br><a href="mailto:amcas@aamc.org">amcas@aamc.org</a><br>(202) 828-0600  |
| <b>Opening Date(s)*</b>          | May 1   |
| <b>Submission Date(s)**</b>      | June 4  |
| <b>Deadline(s)</b>               | The Early Decision deadline including transcript deadline is August 1. Regular M.D. and all other program deadlines range August- December.   |
| <b>Letters of Recommendation</b> | Most medical schools receive letters through AMCAS (5 schools/programs do not participate). Evaluators submit the committee letter or individual letters electronically directly to AMCAS through the AMCAS Letter Writer Application, Interfolio or through U.S. Mail. |
| <b>Standardized Test Scores</b>  | MCAT Scores are automatically sent to AMCAS for distribution to applied participating schools once the applicant scores are available.  |
| <b>Transcripts</b>               | Send transcripts directly to AMCAS attached to an AMCAS Transcript Request Form.  |

## Secondary Applications

Some schools request secondary applications in which applicants must answer additional questions and write additional essays. Some schools ask **all** students for a secondary; others only ask those students whose applications they are considering. There is an additional fee for the secondary application. If you receive a request for a secondary application, complete it as soon as possible. Delay may cause the school to think that you are not serious about their program. And while you delay, other students are getting offers for interviews.

## **The TMDSAS Application**

TMDSAS is the Texas Medical and Dental Schools Application Service, the centralized application service for all applications to the first year entering class at all medical, dental, and veterinary schools supported by the state of Texas. (Baylor College of Medicine is a private school, and thus is an exception.) The TMDSAS application handbook is available online as a pdf.

A unique element of the TMDSAS application is the “match.” Students rank each of the Texas state medical schools at which they have interviewed in order of preference, and the medical schools rank the applicants in order of desirability. The system then matches the student to their highest school that has also ranked them most highly.

## **The AACOMAS Application**

AACOMAS is the centralized application service for all schools of osteopathic medicine. Application instructions and frequently asked questions can be found at <http://help.unicas.com:8888/aacomasHelpPages/instructions/index.html>.

## **Allopathic vs. Osteopathic Medical Schools**

There are actually two pathways to medicine: allopathic and osteopathic. When we think of a physician, we think of an MD, but in the United States, many physicians have trained as osteopathic physicians (DO). Osteopathic medicine began in the 19<sup>th</sup> century as a new approach to medicine that emphasizes preventative care and a more holistic approach to the treatment of disease. While in many ways the training for an MD and a DO are very similar, there are some elements of training that are unique to osteopathic medicine. In particular, osteopathic medicine focuses on a system of hands-on diagnosis and treatment known as “osteopathic manipulative medicine,” which involves physical manipulation of the body.

DOs also receive a medical license and have all of the same privileges to treat patients as do MDs. In many areas, DOs and MDs work together. However, DOs are more likely to train in primary care, and therefore, it is more common to see DOs in rural areas, or working with under-served populations.

The Colleges of Osteopathic Medicine generally have the same prerequisites and use the MCAT exam, but the application service used is AACOMAS rather than the AMCAS. According to the 2015 edition of the AACOM (American Association of Colleges of Osteopathic Medicine), in 2015 there were more than 73,000 practicing osteopathic physicians in the US, and more than 20% of the students studying medicine today are enrolled in schools of osteopathic medicine. In 2015, there were 107 Colleges of Allopathic Medicine vs 34 Colleges of Osteopathic Medicine.

Reasons to consider attending a school of osteopathic medicine: many of the new medical schools that are opening are Schools of Osteopathic medicine, and although all medical schools are highly competitive, admission to schools of osteopathic medicine is slightly less competitive. According to US News and World Report's Education blog, students accepted to osteopathic medical schools have lower average MCAT scores and GPAs.

If you are considering applying to a school of osteopathic medicine, you should shadow one or more osteopathic physicians to obtain a good understanding of the differences.

For more information on schools of osteopathic medicine, please visit <https://www.aacom.org/become-a-doctor>. At the latter site you can download the free and very useful ***Osteopathic Medicine Handbook***. You also might want to check out this article in the NY Times: [http://www.nytimes.com/2014/08/03/education/edlife/the-osteopathic-branch-of-medicine-is-booming.html?\\_r=5](http://www.nytimes.com/2014/08/03/education/edlife/the-osteopathic-branch-of-medicine-is-booming.html?_r=5).

## **Early Assurance Program – Wake Forest School of Medicine**

Well-qualified Wake Forest University undergraduates, upon completion of their sophomore year, may apply for early acceptance to the Wake Forest School of Medicine through the Early Assurance Program (EAP). Although the student still does not enter Wake Forest School of Medicine until after the senior year, this gives him or her the opportunity to know that they have been accepted a year earlier. The deadline for the Early Assurance Program is November 1 of the junior year. Applicants accepted through the Early Assurance Program (EAP) program will be required to take the MCAT and score a 509 or higher before matriculation. Acceptances through the EAP will be on a conditional basis only until that time.

Applicants must have an overall GPA of 3.5 and an overall science GPA of 3.5 (verified each semester in school) and have completed half of the following prerequisite courses to apply to the EAP program. The remaining courses should be completed prior to matriculation. Other recommended coursework includes those listed under the general academic requirements for Wake Forest School of Medicine.

- CHM 111 and lab - College Chemistry I and lab
- CHM 280 and lab - College Chemistry II and lab
- CHM 122 and 122L - Organic I and lab OR CHM 123 Organic I Honors and lab
- CHM 223 and 223 L - Organic II and lab
- BIO 150 and 160 (General Biology) \*this may change
- BIO/CHM370 Biochemistry

**A 3.5 GPA does not guarantee admission. It is just the minimum required for application.**

Students will use the AMCAS application service to apply. After starting the application, students should contact Wake Forest School of Medicine providing their AAMC ID so that they can be granted permission to apply. Once they have been given permission, they can then choose the Early Assurance Program application type on their AMCAS application to continue with their application.

The applicant must be a permanent resident or citizen of the U.S. and must agree to complete requisite courses, to continue the same or better academic excellence, to demonstrate high ethical conduct and not to apply to any other medical school.

Non-acceptance by the EAP does not influence future applications the student may make to Wake Forest School of Medicine.

The Early Assurance Program should not be confused with Early Decision.

## **NURSING**

As baby boomers age and health care needs increase, it is projected that there will be a nursing shortage in the US. There are many levels of nursing degrees.

A Licensed Practical Nurse (LPN) has completed one year of in-hospital training.

A Registered Nurse (RN) has earned a two-year associate degree in nursing, or a bachelor's degree in nursing (BSN) from a four-year college.

If you have earned a liberal arts bachelor's degree and wish to pursue a nursing degree, there are programs that lead to the Second Degree BSN (Bachelor of Science in Nursing) that allow you to earn a second bachelor's degree, in nursing, in one-two years. The BSN degree is a prerequisite for advanced nursing degrees that lead to careers as Clinical Nurse Practitioner or Nurse Anesthetist. Schools that offer the Second Degree BSN can be found at <http://www.bestnursingdegree.com/programs/accelerated-bsn/>.

### **Required courses:**

Human Anatomy with lab (offered in HES to HES majors or with permission)

Human Physiology with lab (Note: the human physiology course at WF does not have a lab.)

Microbiology (prerequisites BIO 150 and 160)



Statistics (offered by a number of departments on campus)

Psychology

Sociology

**Also recommended:** Nutrition, Developmental Psychology

**Graduate Record Exam (GRE):** Most but not all programs require the GRE general test.

**Years of post-graduate education required:** One – two years of an accelerated BSN program

## **NURSE PRACTITIONER OR CLINICAL NURSE SPECIALIST:**

The Nurse Practitioner provides medical care services similar to those of a Physician Assistant. The NP also specializes in areas such as psychiatry or oncology or geriatric care. He or she works closely with physicians and other health care providers in providing primary care to patients. The NP may take patient histories, evaluate the patient, prescribe medications, and make referrals. They may serve as educators, working towards disease prevention. NPs most often work in hospitals, clinics, and physician's offices.

Both the Nurse Practitioner and Clinical Nurse Specialist are master's level nursing positions. A clinical nurse specialist (CNS) specializes in a particular area, such as oncology, emergency room care, or neonatal care. The CNS can practice in a variety of settings, including hospitals, long term care facilities, and clinics, or may even be in private practice. The CNS works with other nurses and health care providers to maximize patient outcomes. In many states, the CNS is able to prescribe medications. The CNS often allows one to move into management-level positions.

### **Requirements:**

Most programs that prepare nurses to become NPs or CNSs require that one first earn a bachelor's degree in nursing. The Bachelor of Nursing degree can be obtained in 1-2 years after completion of a liberal arts bachelor's program. There are several programs that allow students without the BSN degree to go from a four year college into a combined BSN/NP program.

### **Years of post-graduate education required:**

Two years of training beyond the bachelor's degree in nursing, plus additional clinical experience.

## **NURSE ANESTHETIST**

The nurse anesthetist is the primary source of delivery of analgesia in many surgeries of all types, and are in particular demand in rural hospitals and the armed forces.

### **Requirements:**

Beginning in January of 2022, all students entering a nurse anesthesia program must be enrolled in a program which leads to a doctoral degree. This means that the time-frame will become a minimum of three years of graduate education to become a nurse anesthetist. The link to the “become a CRNA” page is <https://www.aana.com/membership/become-a-crna>

## **Nursing Programs at the Wake Forest School of Medicine**

Wake Forest School of Medicine has two nursing programs, run from the downtown campus. The nurse anesthesia program has been in operation for 75 years, and it is ranked at #10 nationally. Being part of a school of medicine, the BSN degree is not required as a prerequisite, as long as the candidate has a BS degree in a related science (biology, chemistry, etc.) and has an RN license and ICU experience.

Their DNP program is a distance format degree, so they can accommodate students from any state. The program is administered in an executive format, such that DNP students can remain in their regular career position, while interacting with faculty and peers through our online delivery platform. The DNP program accepts any master’s-degreed nurse (not specialty-specific) and it takes 24 months to complete the curriculum.

## **OCCUPATIONAL THERAPY**

Occupational therapists assist people with injuries or disabilities to better cope in their home or work environments. For example, this includes helping people with disabilities such as spinal cord injuries participate in work (or school) and social situations, and providing support for older adults experiencing physical and cognitive changes. Occupational therapy programs can be either at the doctoral (OTD) or masters (MSOT) level. The difference between the two degrees is that it is possible to enter the master’s program before completion of the baccalaureate degree, however, the doctoral program requires the degree. It is possible to

enter a dual program to earn a master's degree in occupational therapy and a master in public health.

**Required courses.** Requirements vary by program. But most programs require the following:

Human anatomy with lab

Human physiology with lab (please note: at this time HES 350 does not include a lab)

General biology (Bio 150 and 160)

Developmental Psychology

Abnormal Behavior

Statistics (offered by a number of different departments)

Sociology/Anthropology

**Additional experience:**

Many programs require relevant observational or volunteer experience. To obtain such an experience, contact an occupational therapist at a hospital, nursing home, rehabilitation center, or school near you.

**Graduate Record Exam (GRE).**

The General Test is required.

**Application process:**

Many schools participate in OTCAS, Occupational Therapist Centralized Application Service (<https://portal.otcas.org/>). This allows students to apply to multiple programs with a single application. You must fill out the OTCAS application form, and submit three letters of recommendation plus transcripts from all accredited institutions of higher education which you have attended.

**Years of post-graduate education required:**

Both the OTD and MSOT programs are typically of 2-3 years duration.

## PHARMACY

Pharmacists are health care professionals that dispense drugs that have been ordered by physicians. They provide information to patients about the safe and effective use of prescription drugs. To be a pharmacist, one must earn a doctorate in pharmacy, a Pharm.D.

There are also graduate programs leading to the MS or PhD in pharmaceutical sciences. These programs prepare students for careers in pharmaceutical research leading to drug development and application.

Pharm.D./ PhD, Pharm.D./MBA and Pharm.D./MPH combined degree programs are also offered.

**Required courses.** Requirements vary by program. The list here includes courses required by most programs. Requirements for specific Pharm.D. programs can be found at <https://www.aacp.org/resource/admissions>.

Biology (BIO 150 and 160, with lab)

General Chemistry (BIO 111 and 280, with lab)

Organic chemistry (CHM 122 and 223, with lab)

Calculus

Physics (one semester)

Human Anatomy with lab (offered in HES to HES majors, or with POI)

Human Physiology with lab (Note: HES 350 does not have a lab at this time.)

Biochemistry (BIO 370 or CHM 370)

Microbiology (BIO 326)

### **Also recommended:**

Sociology

Psychology

Ethics (Can be taken in the philosophy or biology departments)

Communications

**Additional requirement:** About two-thirds of pharmacy programs require the Pharmacy College Admission test. For information on this test, visit <http://www.pcatweb.info/>. Other schools require the general GRE exam.

**Years of post-graduate education required:** It generally takes four years to earn the Pharm.D. degree, two years for the MS, and four-five years for a PhD. Some pharmacy programs allow students to transfer in after their sophomore year of college.

## PHYSICAL THERAPY

A physical therapist works with patients who, through injury or illness, have suffered a loss of mobility, and may be suffering from debilitating pain. The role of the physical therapist is to work with the patient to help reduce pain and/or restore function, and to promote quality of life. A physical therapist must enjoy physical activity and working one on one with patients. Physical therapists may work in hospitals, long term care facilities, clinics, home health agencies, schools, fitness centers, work settings, and may even have a private practice. Many physical therapists hold a master's degree, however, few masters programs remain. Today nearly all physical therapy students are in programs which lead to the doctorate in physical therapy (DPT). For more on careers in physical therapy, visit <http://www.ptcas.org/CareersEducation/>. The PhD degree in physical therapy would be appropriate for someone interested in research or an academic career in that area.

It is possible to enter a **dual career program in physical therapy and athletic training**. These programs generally require 6-7 years of study, and prepare one to work in clinics, high schools, and universities, and with professional sports teams, to treat and rehabilitate injured athletes. There are a limited number of dual degree programs but some offer a small number of graduate assistantships, which include a tuition waiver and stipend.

Some students are interested specifically in **sports medicine**. In sports medicine, you work with athletes, assisting with their training and aiding in injury rehabilitation. Those employed in sports medicine can be not only physical therapists, but also MDs and certified athletic trainers. For a list of programs in sports medicine, and further information about the field, visit this web site: [http://education-portal.com/schools\\_that\\_offer\\_sports\\_medicine.html](http://education-portal.com/schools_that_offer_sports_medicine.html).

**To see a list of physical therapy required courses by program, visit this web site:**

<http://www.ptcas.org/ProgramPrereqs/>

**Required courses:** The courses required for admission vary by program, but in general, they include:

Biology (two semesters, but some schools require an additional upper division course.)

Chemistry (one to two semesters. The second semester can be general chemistry II or organic I.)

Physics (two semesters)

Human Physiology

Human Anatomy

Psychology – some schools require an additional psych course, either abnormal psychology or developmental psychology.

Statistics

**Additional recommended courses:**

Exercise physiology

Communication

**Other useful courses:**

Biomechanics

Nutrition

**Additional requirements**

GRE general test required

**The application process:**

Nearly all physical therapy graduate programs participate in PTCAS (Physical Therapist Centralized Application Service). This service allows students to submit a single application which will then be delivered to the schools to which they have chosen to apply. To learn more about the PTCAS, visit <http://www.ptcas.org/home.aspx>.

**Years of post-graduate education required:**

Three years

**List of schools that offer degrees in physical therapy**

<http://physicaltherapy.about.com/od/careersinphysicaltherapy/a/PTSchools.htm>



## PHYSICIAN ASSISTANT

The position of Physician Assistant was created in the 1960's to address a shortage of primary care physicians. There are over 1,000 physician assistants practicing in the US today, and it is the fastest growing sector of the health professions. There are 191 accredited PA programs, but more programs are planned and will be up and running soon.

A Physician Assistant (PA) practices medicine under the direction of a physician. However, it is possible for a PA to have his or her own practice. In rural areas, a PA is often the primary health care provider. While the physician is medically, legally, and administratively responsible for the patient, the PA can examine patients, analyze laboratory results, order treatment and direct follow-up care.

According to the American Association of Physician Assistants, many PAs are in primary care (32%), but 26.6% are in surgical subspecialties, 11% in emergency medicine, 10% in internal medicine, and 18.8% in other specialties.

One of the major advantages of being a Physician Assistant is that the training is generally about 27 months, as compared to four years plus a residency for the MD, and there is no internship or residency. PA training has one year of classroom work followed by 2000 hours of clinical training.

PA programs are often as competitive as medical school, and have the additional requirement of 1000 or more hours of hands-on clinical experience before admission. A recent report by the Physician Assistant Education Associations reports that the mean overall GPA for matriculating students was 3.58. The science GPA was 3.5.

### **What major should I choose?**

Fifty percent of students who matriculate to PA school major in natural sciences (biology, chemistry or physics), 20% in health sciences, and 14.5% in applied sciences such as nursing. 15% majored in other areas such as languages and humanities.

### **Required courses:**

**Course requirements vary from program to program, but the following courses are required by most:**

1) Chemistry – **CHM111 and 122, and possibly BIO-CHM 370.** The chemistry requirement varies from program to program. Almost all require a minimum of two semesters of chemistry, which can be general chemistry I and II, or one semester of general chemistry and one semester of organic. Some schools have a requirement for a third course, either an organic or biochemistry course. The Wake Forest PA program is one of those that requires a course in biochemistry.

2) Human anatomy with lab: **HES352**. This course is generally restricted to HES majors. However, students who need this course as a prerequisite for a health professions graduate program can request the course. HES352 is only offered in the spring. Request that you be added to the waiting list for the course at the beginning of the fall semester.

3) Human physiology **with lab** - Please note - at this time **HES350 does not have a lab**.

4) Microbiology with lab **BIO326**. As an upper level course, which requires BIO150 and 160 as prerequisites.

5) Two additional upper level biology courses

**Required by SOME programs:**

6) Medical terminology (not offered at WF but can be taken online). The WFU PA program will accept a medical terminology course through Winston Salem State. The student may also check with a local community college for a medical terminology course. The WFU PA program will accept a transcript or certificate. The student may also consider taking medical terminology from an online institution such as Corexcel, Universal Class or University of New England Distance Learning.

7) Biochemistry **CHM370 or BIO370**. This course counts simultaneously in both departments. So you can take it in either department, and it counts towards the major or minor in both.

8) Statistics (required by most programs. Can be taken in math, psychology, HES, sociology or biology departments).

**Also recommended:**

9) Psychology-- developmental psychology **PSY241 (prereq is PSY151)**

**Additional requirement for all programs:**

Clinical experience: In addition to required coursework, applicants to PA programs must have relevant hands-on clinical experience. Volunteer activities generally do not count. The amount of clinical experience required varies, but generally is in the range of 1,000-2,000 hours. Some programs require as many as 3,000 hours of clinical work.

It is very difficult to acquire this experience while in college, so most candidates for PA programs have worked in the medical field for at least one year before being admitted to a program.

Shadowing: Shadowing a physician or PA is not considered hands-on clinical experience, nor is administrative work. Many students acquire the necessary experience by working either as an EMT (emergency medical technician), CNA (clinical nurse assistant), medical scribe, or medical assistant. One can train as a CNA in only 200 hours (5 weeks) at a community college, and

through the Red Cross. Basic EMT training is only 110 hours, and also is offered by most community colleges. An EMT course, HES 232, is offered through the Health and Exercise Science Department at Wake Forest. Take this course as soon as possible if you plan to acquire hours by working as an EMT. However, also note that hours working as a volunteer on the campus EMT service may not count as clinical hours.

### **Course planning:**

It is generally recommended that health professions students take only one science lab course during the first semester. Lab courses are very time consuming. This allows time to adjust to the college workload. Spreading out the science courses also increases the likelihood of doing well in these courses. This is true for students who plan to major in biology and chemistry as well. However, if a student feels that he or she is very well prepared, and plans to major in a science, taking two science lab courses in the first semester is not unreasonable.

**Graduate Record Exam (GRE):** The General test is most often but not always required. Be sure to have your GRE scores sent directly to CASPA (as explained below). Each program has its own CASPA code.

**Completion of courses:** Check with each school to see how many courses you can have in progress or not yet started by the application deadline. It varies by school. Some require that all prerequisite courses and patient care hours be completed before application.

### **Application Process:**

For information on applying to physician assistant programs, visit <http://www.paeaonline.org/index.php?ht=d/sp/i/194/pid/194>.

Many programs participate in CASPA, an online application service developed by the Physician Assistant Education Association (PAEA). CASPA allows a student to apply to a number of programs through a single application form. The CASPA application needs to be filed at least four weeks before the program application deadline to allow time for processing. Be sure to check the application deadline for each program to which you plan to apply, since application dates vary by program. Some programs may request an additional, supplemental, application. **START HERE:** Everything you need to know about filling in the CASPA application, step by step! <https://portal.caspaonline.org/caspaHelpPages/about-caspaoverview/>.

**Apply early! Most schools have rolling admissions. Application open in late April or early May.** The application is time consuming. Your letters will not be requested until you fill out the CASPA application.

Be sure to keep track of all of your volunteer and patient care hours. The PA programs want specifics!

CASPA, has a Facebook page. This page is designed to answer CASPA-related questions and provide application cycle information, general and specific, for all CASPA applicants. You can find it at [www.facebook.com/CASPAOnlineApp](https://www.facebook.com/CASPAOnlineApp).

The Physician Assistant Education Association, PAEA, also has a Facebook page, <https://www.facebook.com/pages/PA-Focus/238250712898634>, or you can follow it on Twitter, <https://twitter.com/paeaonline>, for the most up to date PAEA and PA news.

### **Years of post-graduate education required:**

The average duration of a PA program is 27 months. This includes up to 12 months of pre-clinical classwork, followed by up to 15 months of clinical training.

## **VETERINARY MEDICINE**

### **Choosing a major:**

It is not important that you be a science major to attend veterinary school. It is critical, however, that you complete all prerequisite courses! You can take these courses as electives, while pursuing your longstanding interest in art, music, history... whatever it is that you love. If you choose to major in a discipline that you really enjoy, you will most likely do better academically, and enjoy your college experience more. If science is what you love, go for it. If you are not a science person, it is important that you do well in the required science courses.

### **Course prerequisites**

Prerequisites vary by program. Check individual programs to which you plan to apply. A list of prerequisites by school can be found at <http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx>.

Below is a list of prerequisites *generally* required by most veterinary programs. But requirements vary widely by program, and you should check specific programs for additional requirements.

General biology (BIO 150-160)

General chemistry (CHM 121 and 280)

Organic chemistry (CHM122 and 223)

Physics (PHY 113 and 114)

Math and/or statistics (statistics is offered by many departments)

Microbiology (BIO 326)

**Also required by some programs:**

Nutrition

Communications

Additional science electives

**Possible course plans**

Below are two possible course plans. Because there are so many requirements for veterinary school (more than medical school!), the preparation can be very intense. It is strongly recommended that you not take two lab science courses during your first semester unless you are a strong student in the sciences. It is important to start out strong academically, and often the first semester in college requires some adjustment of study habits. Some schools recommend not taking two lab sciences at the same time until the sophomore year. One way to spread out the requirements is to take some of the prerequisite courses in summer school, at Wake Forest or elsewhere. But another way is to spread the requirements out over the full four years, and take a gap year to apply to veterinary school (see the section on the Gap Year). That allows you to devote more time to the service and shadowing that you need to make you a competitive applicant, and also permits study abroad.

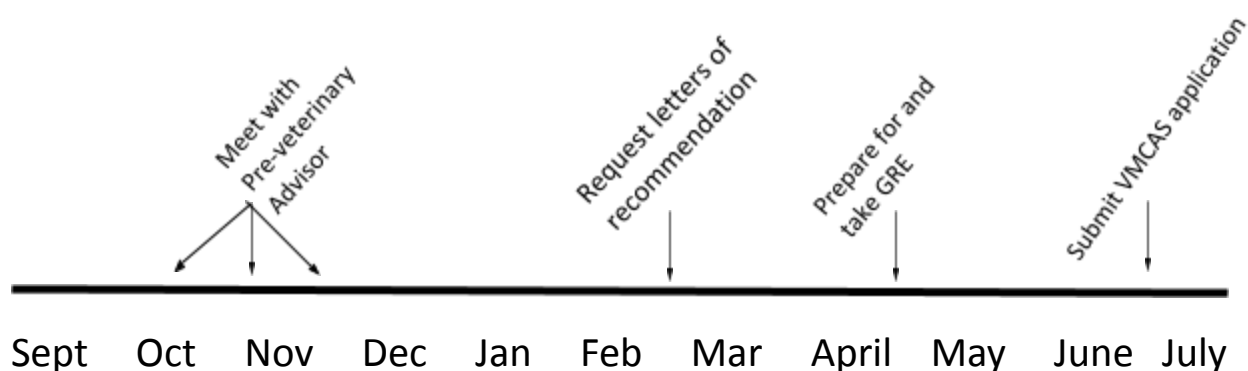
Remember, it does no good to rush through the prerequisites, only to find at the end of three years that your GPA is not competitive! It is very difficult to overcome a transcript full of C's and repeated courses.

**Hardcore option (Plan A) - for students entering in 2019 or later:**

| Fall year 1              | Spring year 1              | Fall year 2                 | Spring year 2 | Fall year 3                   | Spring year 3                                   | Summer year 3                        | Fall year 4                    | Spring year 4                  |
|--------------------------|----------------------------|-----------------------------|---------------|-------------------------------|---|--------------------------------------|--------------------------------|--------------------------------|
| CHM 111/L<br><br>MTH 111 | CHM 122/L<br><br>BIO 150/L | CHM 223/L<br><br>*BIO 160/L | CHM 280/L     | PHY 113/L<br><br>Microbiology | PHY 114/L<br><br>Biochemistry<br><br>Statistics | Complete application<br><br>Take GRE | Complete divisionals and major | Complete divisionals and major |

**Four-year plan (Plan B) - for students entering in 2019 or later:**

| Fall year 1               | Spring year 1               | Fall year 2              | Spring year 2            | Fall year 3   | Spring year 3 | Fall year 4                   | Spring year 4                             | Right after graduation               |
|---------------------------|-----------------------------|--------------------------|--------------------------|---------------|---------------|-------------------------------|---|--------------------------------------|
| CHM 111/L<br><br>Math 111 | CHM 122/L<br><br>Statistics | CHM 223/L<br><br>BIO 150 | CHM 280/L<br><br>BIO 160 | Study abroad? | Biochem       | PHY 113/L<br><br>Microbiology | PHY 114/L<br><br>Prepare for and take GRE | Complete application<br><br>Take GRE |

**Timeline****Shadowing and Experience**

One of the things that Veterinary Schools will look for is evidence that you know what it means to be a vet. You can get this experience in two ways, first by shadowing a veterinarian and second, by doing volunteer work which involves work with animals.

Finding a veterinarian to shadow is generally not difficult. Prepare a cover letter and resume, and drop it off at the veterinarian's office. Follow up with a phone call. You will find most veterinarians are eager to help. If it is possible, shadow more than one veterinarian. How many hours should you shadow? A minimum of 50 hours; more is better. Establishing a good relationship with a veterinarian can be very useful as a strong letter of recommendation from a vet can be very beneficial.

There are many relevant volunteer opportunities at your local animal shelter, pet adoption agency (AARF in Winston-Salem), or even at an aquarium, if possible.

## Application process

The Graduate Record Examination (GRE) is required by most veterinary schools, and some also require the Biology GRE. Some schools will accept the Medical College Admission Test (MCAT). It is best to take the GRE in early spring, so that you can take it a second time if necessary. If you plan on taking the Advanced Biology GRE, allow ample time to prepare. How do you know whether you need to retake the test? The average GRE score for students admitted to veterinary school is around the 75<sup>th</sup> percentile.

Application to Veterinary School is not subject to the Health Professions Committee process. No Health Professions Committee letter is required.

Start with a visit to the American Veterinary Medical Association (AVMA) site *Veterinary School Admission 101*: <https://www.avma.org/public/Careers/Pages/vet-school-admission-101.aspx>

Application to veterinary school is done through a centralized application service, VMCAS, which is run by the American Association of Veterinary Medical Colleges (AAVMC). Applications open in May, and are due in September. But it requires some time to fill out, so start early. It is best to apply as early as possible, since transcripts and letters must be verified by VMCAS and this can take some time. For more information on VMCAS, see:

<http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx>