GOOD BEGINNINGS

The Health Professions and Prelaw Center (HPPLC) advises students--freshmen through graduate students--who are preparing for medical school. Admission is highly competitive, and it is important for you to have correct and current information. In addition to reading this guide, please read all information on the HPPLC website (www.hpplc.indiana.edu) related to careers in medicine and healthcare, the application process, and the HPPLC Recommendation Service. Please make sure that you are subscribed to the HPPLC mailing list for your area of interest. Through the list you will receive pertinent information about meetings, deadlines, and opportunities. Attend as many events for premedical students as you can.

COURSE REQUIREMENTS FOR INDIANA UNIVERSITY SCHOOL OF MEDICINE

The following science course work is required for admission to Indiana University School of Medicine; each course must include a lecture and a laboratory component:

<table>
<thead>
<tr>
<th>IU SCHOOL OF MEDICINE REQUIREMENT</th>
<th>IU BLOOMINGTON EQUIVALENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>General/inorganic chemistry, 8-10 credit hours</td>
<td>CHEM-C 117 and CHEM-N 330*</td>
</tr>
<tr>
<td>(one academic year)</td>
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<tr>
<td>Organic chemistry, 8-10 credit hours</td>
<td>CHEM-C 341,** 342, and 343</td>
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<tr>
<td>(one academic year)</td>
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<tr>
<td>Physics, 8-10 credit hours</td>
<td>PHYS-P 201 and 202 or PHYS-P 221 and 222</td>
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<tr>
<td>(one academic year)</td>
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<tr>
<td>Biological sciences, 8-10 credit hours</td>
<td>BIOL-L 111, 112, and 113 or BIOL-L 112, 113, and 211</td>
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<tr>
<td>(one academic year)</td>
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**SEQUENCE OF CHEMISTRY COURSES FOR PREMED STUDENTS**

<table>
<thead>
<tr>
<th>CHEM-C 117 Principles of Chemistry and Biochemistry I</th>
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<tbody>
<tr>
<td>CHEM-C 341 Organic Chemistry I Lectures</td>
</tr>
<tr>
<td>CHEM-C 342 Organic Chemistry II Lectures</td>
</tr>
<tr>
<td>CHEM-C 343 Organic Chemistry I Laboratory***</td>
</tr>
<tr>
<td>CHEM-N 330 Intermediate Inorganic Chemistry</td>
</tr>
</tbody>
</table>

* In order to obtain the best preparation to meet the requirements for all medical schools, students should complete the sequence of courses for chemistry majors through CHEM-N 330, including CHEM-C 341, 342, and 343. Students should complete CHEM-C 342 and 343 before CHEM-N 330. The Indiana University School of Medicine will accept CHEM-C 118 in place of CHEM-N 330. However, the IUB Department of Chemistry and HPPLC strongly recommend all premed students complete CHEM-N 330 instead of CHEM-C 118 to meet the general/inorganic requirements for admission to medical schools.

** Premed students should not enroll in the alternate organic chemistry course CHEM-R 340. Students cannot obtain credit for both CHEM-R 340 and CHEM-C 341.

*** It is recommended that students enroll concurrently in CHEM-C 342 and 343.

The minimum requirement for entering the Indiana University School of Medicine is 90 credit hours, excluding physical education and ROTC courses. Any major from the traditional arts and sciences curriculum is acceptable. Applications of students with educational backgrounds in other fields will be evaluated based on a minimum of 90 credit hours (three academic years) of college course work of arts and sciences equivalence.¹

*Students should be aware that some medical schools will not accept Advanced Placement or credit-by-examination towards meeting admission requirements, or accept such credit only under restricted circumstances. Students should also be aware that receiving an exemption from a requirement is not generally considered equivalent to Advanced Placement credit, credit-by-examination, or credit from coursework. College-level coursework is often preferable for preparation for the Medical College Admissions Test (MCAT).*

¹ Note that very few students are admitted and enroll having completed only the minimum number of required credit hours (three years of college coursework).
ADMISSION REQUIREMENTS FOR OTHER SCHOOLS

Requirements for many other medical schools are similar to the requirements of the Indiana University School of Medicine, but there can be important variations. Most medical schools require one year of lecture and lab in biology, general/inorganic chemistry, organic chemistry, and physics. Additional common requirements include one year of English composition and a semester or year of math (see below). An increasing number of medical schools require biochemistry, and most medical schools now strongly recommend it. Students should review the Premedical Coursework page on the HPPLC website and review the websites of the individual medical schools for detailed information.

MATH

Many medical schools have no specific math requirement, although many of the required science courses at IU Bloomington have math prerequisites that students must meet before enrolling, and most undergraduate degree programs require math. Of the medical schools that have a math requirement some specifically require one or two semesters of calculus. Some medical schools will accept a statistics course in place of one semester of calculus.

MAJOR

Medical schools do not have a preference for any specific majors. There is neither a preference for science majors or for non-science majors. Therefore, you may major in almost anything. If you question this, read Chapter 2 "Building a Strong Foundation: Your Undergraduate Years" in Medical School Admission Requirements 2012-2013, available at the HPPLC front desk. This book is published by the medical schools and is the most authoritative source for preparation for and admission to medical school. One passage from Chapter 2 of the book may interest you:

Unbeknownst to many college students, there is no such thing as the “best” major for those bound for medical school. In fact, no medical school requires a specific major of its applicants. That’s because admissions committee members know that students develop the essential skills of acquiring and synthesizing information through a wide variety of academic disciplines and therefore should be free to select whichever majors they find interesting and challenging.

Even so, many premedical students choose to major in a scientific discipline. If that's the direction you're heading, and you're doing so because you are fascinated by science and believe that such a major will be the foundation for a variety of career options, great. If you're doing so because you believe it will enhance your chances for admission, think again. Admissions committees welcome students whose intellectual curiosity leads them to a wide variety of disciplines.

And no… you won’t necessarily be at a disadvantage if you choose to major in English, for example, rather than biology. Using just one measure, those of MCAT scores, you may be surprised to learn that there is very little difference in median total scores among those who major in the humanities, social sciences and biological sciences.²

You should consider a major which you enjoy, in which you perform well, or which might serve as a basis for further graduate work or for employment in the event you choose not to apply or you are not admitted to medical school. Admission committees expect variety in an educational program, including a significant number of humanities and social and behavioral science courses in addition to science courses. The majority of our premedical students major in science; however, many applicants majoring in non-science areas are successful applicants to the Indiana University School of Medicine as well as to other medical schools. All applicants must meet the schools' specific requirements, regardless of major. At IU-Bloomington, premedical students usually choose a major in the College of Arts and Sciences, although majors from other schools may be selected.

² Association of American Medical Colleges, Medical School Admission Requirements, 2012-2013, (Washington, D.C.2011) p. 10
FACTORS IN ADMISSION

A number of factors may be considered by medical school admission committees. These differ in importance by school, but generally include academic credentials (GPA, course load, and grade trends), MCAT scores, a personal interview, and letters of evaluation, perception of personal character, interpersonal skills, as well as demonstrated knowledge of and commitment to the profession and knowledge of the school and its program. Some schools interview only those applicants meeting certain initial standards based on residency, GPA, and MCAT. It should be noted that a low GPA and MCAT cannot be overcome by an excellent interview; however, a low grade or one semester of poor grades will probably not keep a good candidate out of most medical schools. Schools look at the background of applicants and judge whether they are ready for the rigors of medical school.

MEDICAL COLLEGE ADMISSION TEST (MCAT)

The Medical College Admissions Test is a standardized exam required by medical schools across the country. The MCAT plays a significant role in medical school admissions decisions. You cannot substitute a sparkling personality or hours of volunteer work for an acceptable MCAT. The MCAT is typically an extremely challenging exam, even for the brightest and most talented students.

The MCAT is designed to assess competencies in areas important for success in medical school and a career as a physician. Concepts in biology, chemistry, and physics represent core areas in the sciences you will need to master, and you should complete coursework in these areas before taking the exam. You should also take courses in psychology and sociology before taking the MCAT.

There are specific college courses that you should complete before the MCAT, but beyond that, you should use your undergraduate education to become a skilled, critical reader and thinker. Taking challenging courses in the sciences, the humanities, and social sciences can help you develop the reasoning skills you will need for this exam.

A new revised version of the MCAT will be offered in 2015, and it is likely that you will be taking this exam after your junior year of college in the summer of 2015, or later. Just like the current exam, the revised MCAT will test core science concepts in biology, general chemistry, organic chemistry, and physics. Some of the changes will include expanded content in additional areas such as biochemistry and cellular/molecular biology in the natural sciences sections of the exam to reflect recent changes in medical education. In addition, a new section of the exam, the Psychological, Social and Biological Foundations of Behavior section, will also test concepts from the social and behavioral sciences, reflecting a concern for the importance of socio-cultural and behavioral determinants of health and health outcomes. A new Critical Analysis and Reasoning Skills section of the exam will test broad analysis and reasoning skills. The revised exam will also place greater emphasis on research methods and statistical reasoning than the current exam. You should consult information on the HPPLC website on preparing for the MCAT and courses at IU Bloomington that you should complete before the exam.

ACADEMIC EVALUATIONS

As part of your application to medical school you will be required to submit academic evaluations written by your professors. Evaluations are usually requested from professors in the sophomore and junior years and at the conclusion of the class, rather than a year later. If you have had particularly noteworthy achievements in a freshman class, these too may provide a valuable evaluation. HPPLC offers a recommendation service that can help you in obtaining letters of recommendation for your application.

We strongly urge enrollment in some small size or seminar-type classes in which you work closely with your professors. Make yourself known to instructors if they have time to talk during office hours – even if you think you understand all the material. Taking more than one small class from a teacher may be helpful. Getting an evaluation from an instructor in a small upper-level class in which you have demonstrated exemplary work is ideal.

In addition to science evaluations, academically challenging courses in a non-science subject of interest will be one excellent means to demonstrate your intellectual versatility. Undergraduate research provides another wonderful opportunity for interested students to develop relationships with faculty. Do not underestimate the importance of these letters, and do not leave this task until late in your junior year.
In addition to questions from students about major, requirements for admission, the MCAT and recommendation letters, here are a number of additional questions frequently asked, with our answers.

**IS THERE A PREFERENCE SHOWN FOR THE BACHELOR OF SCIENCE OR BACHELOR OF ARTS DEGREE?**

No. Each applicant’s record is evaluated on an individual basis. Both Bachelor of Science and Bachelor of Arts degrees are acceptable for premedical programs. Often a B.S. program in the sciences requires a student to delve into the subject in greater depth, and an admission committee will be aware of this fact. However, an admission committee would expect an applicant to do well with either degree. The B.A. degree leaves room for a greater breadth of study and this, too, may be attractive to all admission committees. Committees look at the quality of the transcript rather than the name of the degree.

**SHOULD I ENROLL IN AN HONORS PROGRAM?**

If it interests you, yes. Admissions committees look at the level of difficulty of an applicant’s course work. In many instances, the greater depth and breadth of honors programs/courses are reflected in a greater knowledge of the subject area in question. Classes are often smaller, and classmates are similarly motivated achievers. Many successful medical school applicants have enrolled in honors programs; however, many successful applicants have completed rigorous curricula which did not include honors courses.

**DO MEDICAL SCHOOLS REQUIRE A FOREIGN LANGUAGE FOR ADMISSION?**

The College of Arts and Sciences at Indiana University Bloomington requires the study of a foreign language. We know of no medical school that does; however, medical students and practicing physicians have found working knowledge of a second language very helpful.

**WHAT’S SO DIFFICULT ABOUT BEING A PREMEDICAL STUDENT?**

For many freshmen, the most difficult task is to acquire the study skills and self-discipline required to attain academic excellence. Many freshmen premed students have been highly successful in high school. They have been accustomed to being “stars”, frequently without having developed systematic study habits. The success of your academic transition to Indiana University Bloomington depends not only on ability, but also strongly upon motivation, organization, and the learned skills of studying effectively. Some of you will initially be discouraged and will have to have the determination to learn how to study more systematically. Demands of the premedical curriculum are rigorous. You may have to work harder than students who are not aiming for competitive admission graduate programs.

**IS IT BECOMING MORE DIFFICULT TO GET INTO MEDICAL SCHOOL?**

Even among those students who succeed in passing premed science coursework and take the MCAT, in most years less than half of all applicants to MD programs are admitted. In 2011 there were 43,919 applicants competing for approximately 19,000 seats in allopathic medical schools. If you do the math, that means that fewer than one out of two applicants were admitted. There are far fewer seats available in medical schools than qualified applicants. Medical school admission committees are able to ask for high standards. Freshman students should anticipate that by the time they apply they may need to meet higher admission standards than were in effect when they started college. You must be determined, well prepared, and well informed. You should actively explore alternative approaches and alternative careers – keep your options open!

**IS IT ALL OVER IF I HAVE A BAD SEMESTER?**

There is a false but persistent rumor among freshman premedical students that if you have a bad science grade or a bad semester you will have to give up. That’s not true. Medical school admission committees look carefully at student abilities and development. They realize that not every student enters college with a burst of academic brilliance. They expect an excellent academic record, but will make allowances for problem semesters or a slow start----some allowances.

**WHEN SHOULD I TAKE THE MCAT?**

The best advice is to take the MCAT when you have thoroughly prepared and are ready to perform well on the exam. You will want to consider the timeline of completion of premedical coursework and the timing of your
application also in deciding when to schedule the exam. Before taking the exam, you will need to complete science coursework in biology, general chemistry, organic chemistry, biochemistry, and physics. You will also need to take coursework in psychology and sociology before the exam.

If you are planning to begin medical school directly following graduation, then you should plan to complete the coursework needed by the spring of your junior year, and take the MCAT early in the summer between junior and senior year. You will want to take the MCAT by early summer of whatever year you plan to apply to medical school. For example, if you are applying for the entering medical school class of fall 2016, we would recommend that you complete all premed requirements by spring semester of 2015 and take the MCAT in the early summer of 2015.

**WHAT IS THE MEAN GRADE-POINT AVERAGE (GPA) OF STUDENTS ADMITTED TO MEDICAL SCHOOLS?**

It varies from school to school. The average GPA for the Indiana University School of Medicine usually is around a 3.7 or 3.8. Talk with an advisor about this. While numbers are important, trends, course loads, and personal circumstances all may enter into admissions decisions. Preserving a 4.0 GPA by taking a light course load, spreading science courses out, or completing them over the summer or at other campuses can be self-defeating, as admissions committees are on the lookout for students who are pursuing such strategies to artificially inflate their GPA’s. Beware of advice to take certain courses that are thought to be “easy” in order to boost your GPA (such advice can often be faulty, anyway). If premedical students on our campus have determined that they are “easy” courses, medical school admissions committees might make the same determination.

**ARE EXTRACURRICULAR ACTIVITIES IMPORTANT?**

In addition to high levels of academic achievement, medical schools look for many traits in applicants, including motivation, evidence of concern for serving others, responsibility, maturity, leadership, communication skills, breadth of interests, and ability to manage multiple tasks. Students are encouraged to participate actively, but not to substitute extracurricular activities for academic excellence. Moreover, a list of organization memberships means little to experienced committees. An admissions committee will be interested to know what you have contributed.

There is no list of preferred activities. However, volunteer activities through which you develop your interpersonal skills and gain experience working with people from a wide variety of backgrounds (not just fellow college students), are especially relevant. Any volunteer activity that requires you to provide support for people facing distress will especially be valued by admission committees as helping you to prepare for the role of a physician.

A good beginning resource for finding appropriate volunteer activities can be found in the medicine section under “Community Service Experience” on the HPPLC website ([http://www.hpplc.indiana.edu/medicine/med-coexp.shtml](http://www.hpplc.indiana.edu/medicine/med-coexp.shtml)). This section provides information on the types of activities you may wish to seek and web resources for locating volunteer agencies. Also, a central location for those seeking these activities may be found on the Bloomington Volunteer Network website at [http://bloomington.in.gov/volunteer/](http://bloomington.in.gov/volunteer/).

**WHAT IS OSTEOPATHIC MEDICINE?**

Osteopathic Physicians (DOs) are fully licensed physicians and share the same privileges as MDs. They can analyze, diagnose, prescribe drugs and therapy, perform surgery, and pursue all of the medical specialties available to MDs. In addition, they receive hundreds of hours of additional training in manipulative medicine techniques and diagnosis. With Osteomaneuverative Treatment (OMT), Osteopathic Physicians use their hands to diagnose injury and illness and encourage the body’s natural healing processes. The patient is viewed as a whole rather than a collection of parts. Special attention is focused on the musculoskeletal system as it reflects and influences the condition of all other body systems. Osteopathic schools hold that this training makes possible a better understanding of the ways that an injury and illness in one part of your body can affect another.

**WHAT CHANCE DOES A NONRESIDENT HAVE AS AN APPLICANT TO THE INDIANA UNIVERSITY SCHOOL OF MEDICINE?**

Many state-supported schools show preference to their own state residents. It is not unusual for the Indiana University School of Medicine to offer places to 100 or more nonresidents per year, and non-resident Indiana University students with good records are encouraged to apply.
HOW DO I KNOW IF MEDICINE IS THE RIGHT CAREER FOR ME?

Read, talk, listen, observe, and compare. Shadow physicians to learn what they do on a day-to-day basis. Read about healthcare issues and changes occurring in medicine. Talk with physicians about what they like and don't like about their profession. Attend HPPLC meetings and listen to health professionals who come to talk about their careers and answer student questions. Pay attention to your progress in the sciences. Are you a good science student? Observe through volunteer opportunities what it will be like to work with people requiring medical assistance. Investigate other careers so you have some comparisons. That's a lot of work--but if you enter the medical profession, you may be a physician for forty or more years. Make sure that you like doing what physicians do.

HOW CAN THE HEALTH PROFESSIONS AND PRELAW CENTER HELP ME?

Preparing for medical school requires careful, long-range planning and accurate information. Advisors at the Center specialize in helping students prepare for medical careers. Advisors can help you with questions regarding premedical coursework, volunteering, preparing for the MCAT, how to request recommendations, and navigating the application process. Our website contains useful information on preparing for medical school and other health professions. Remember that we want to contribute toward your successful entry to a program of your choice.