

# PREHEALTH PROFESSIONAL PROGRAM

*College of Natural Sciences and Mathematics*

## Program Description

Students planning to attend medical (allopathic or osteopathic), dental, pharmacy, veterinary, or optometry school are not required to complete a particular undergraduate major. In fact, most health professional schools state that students can be admitted after completing 90 semester units of college credit that includes a set of specified courses. However, the reality is that most students who are accepted to health professional schools earn a bachelor's degree prior to admission. A majority of students applying to health professional schools major in biological sciences or chemistry. However, the most important criterion in selecting a major is that you have a real interest in the field.

The pre-health professional advising patterns described in this section are not majors. For example, Sacramento State does not offer a "Pre-med major." Instead, the advising patterns identify the set of courses that must be completed before admission to particular types of health professional schools. In the case of some majors (e.g., Biological Sciences and Chemistry) there is considerable overlap in course requirements. However, the courses can be taken along with any major (e.g., English, Philosophy, Psychology, etc.) and used to satisfy General Education or elective requirements for the baccalaureate degree.

The common set of courses recommended for all of the medical-related professional schools covered in this section are listed below. Additional requirements for specific health professional schools follow the list of recommended core curriculum. It is important to note that requirements for a particular type of professional school (e.g., Dental School) may differ from one university to another, and that requirements are subject to change. The requirements listed in this section are those identified by most universities offering the identified professional program. Therefore, the lists may include courses that are not required by a particular university and may omit a course that is required by another university. It is strongly recommended that students interested in applying to professional schools contact one of the advisors listed in this section for assistance in planning their programs. It is also strongly recommended that students visit the Web sites of the universities they plan to apply to in order to be sure that they meet all requirements.

All health professional schools require strong academic ability and a good foundation in the sciences. In addition, good problem solving ability, effective oral and written communication skills, an awareness of interpersonal dynamics, an appreciation for cultural diversity, and an understanding of health care issues are important. Therefore, in addition to science courses, pre-health professional students should take general education courses that will enrich their non-science preparation in these areas.

It is also crucial that students have volunteer experience related to their professional goals. Such experience will provide more insight into how well suited you are to the work setting you are considering. Academic credit may be received for volunteer work by seeing an advisor and registering for BIO 195.

For more information about the Pre-Health Professional Program, please click here (<http://www.csus.edu/prehealth/>).

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## Recommended Core Curriculum

Units required: 46

**Note:** Core courses should be taken by all students who plan to attend a medically related professional school, regardless of major.

Code	Title	Units
BIO 1	Biodiversity, Evolution and Ecology	5
BIO 2	Cells, Molecules and Genes	5
CHEM 1A	General Chemistry I	5
CHEM 1B	General Chemistry II	5
CHEM 24	Organic Chemistry Lecture I <sup>1</sup>	3
CHEM 25	Organic Chemistry Laboratory <sup>1</sup>	3
CHEM 124	Organic Chemistry Lecture II <sup>1</sup>	3
ENGL 5	Accelerated Academic Literacies	3
ENGL 20	College Composition II	3
PHYS 5A	General Physics: Mechanics, Heat, Sound	4
PHYS 5B	General Physics: Light, Electricity and Magnetism, Modern Physics	4
PSYC 2	Introductory Psychology	3
<b>Total Units</b>		<b>46</b>

<sup>1</sup> Some Dental Schools and Optometry Schools require only one semester of Organic Chemistry with lab. This can be satisfied by taking CHEM 20 (Organic Chemistry Lecture Brief Course) (3 units) and CHEM 20L (Introductory Organic Chemistry Laboratory) (1 unit) instead of CHEM 24, CHEM 25 and CHEM 124.

**Note:** In addition to the courses listed above, most health professional schools require that students complete 6-12 units of humanities coursework and 6-12 units of coursework in the social and behavioral sciences. Courses included in areas C and D, respectively, of the Sacramento State General Education program satisfy these requirements. A few schools specifically require an English literature course as one of the humanities courses, and a few schools specifically require Sociology (SOC 1) as one of the courses from the social and behavioral sciences.

## Recommended Field Specific Curricula

### Allopathic Medical Schools

When most people use the term "Medical School," they are usually referring to Allopathic Medical Schools that grant the M.D. (Doctor of Medicine) degree. There is, however, another type of Medical School, called Osteopathic Medical School (described below) that grants the D.O. (Doctor of Osteopathic Medicine) degree. Both M.D.'s and D.O.'s are eligible for licensure to practice medicine as physicians and surgeons in the State of California.

Applicants do not need a 4.0 GPA to get into an allopathic medical school. However, GPA is a reflection of your ability to handle university work and is an important part of your application. A successful applicant must be able to offer more than a good GPA. The attributes of motivation, social concern, communication skills, and maturity are given great weight in the selection process.

All students applying to allopathic medical schools must complete the recommended course requirements listed above. In addition to the

common courses, most allopathic medical schools require one semester to one year of college mathematics. In general, the mathematics requirement can be satisfied by taking a full year of calculus. However, some medical schools specify that one of the courses must be statistics. Therefore, if you want to be sure that you have completed the math requirement for the greatest number of medical schools, you should take the following courses:

Code	Title	Units
MATH 26A	Calculus I for the Social and Life Sciences	3 - 4
or MATH 30	Calculus I	
MATH 26B	Calculus II for the Social and Life Sciences	3 - 4
or MATH 31	Calculus II	
STAT 1	Introduction to Statistics	3
<b>Total Units</b>		<b>9-11</b>

It should be noted that there are variations in medical school admission requirements. For example, some schools also require or recommend one or more of the following courses:

Code	Title	Units
BIO 127	Developmental Biology (embryology)	4
BIO 184	General Genetics (genetics)	4
BIO 121	Molecular Cell Biology (cellular or molecular biology)	3
or BIO 180	Advanced Molecular Biology	
CHEM 161	General Biochemistry (biochemistry)	3

And/or one year of a foreign language

For information on requirements for specific schools, contact your pre-health advisor or visit the Web site of the school you are interested in attending.

Applicants must take the Medical College Admissions Test (MCAT). The test should be taken after completing the recommended core curriculum. You should allow at least 10 months between taking the exam and the date of planned matriculation. The schedule for the MCAT is currently under review. It is expected that beginning January 2007, the MCAT will become computer based and will be offered two to four times per year. For more information about dates, students should go to: [www.aamc.org](http://www.aamc.org) (<http://www.aamc.org/>). To ensure timely submission of all application materials (including letters of recommendation), students are strongly advised to take the exam no later than April of the year preceding planned matriculation. Your MCAT scores, especially your verbal reasoning score, are an important part of your application.

Most Allopathic Medical Schools subscribe to an application service called The Association of Medical Colleges Application Service (AMCAS). What this means is that you will have to complete a single (but very lengthy and complicated) initial application and submit a single set of transcripts and MCAT scores to AMCAS. In turn, AMCAS, for a fee, will distribute the materials to the medical schools you identify on the application. The AMCAS application is usually available in June of the year preceding the year you wish to matriculate. For example, the AMCAS application for admission in fall 2007 is available in June 2006. Participating medical schools set their own deadlines for receipt of application materials from AMCAS. The earliest deadline is usually November 1 of the year preceding planned admission. It is strongly

recommended that you complete your AMCAS application soon after it becomes available, even if you plan to take the August MCAT.

The medical schools will review your AMCAS application and MCAT scores. After this review, the school will either reject your application or invite you to submit a school specific secondary application and letters of recommendation. Following a review of these materials, the school will either reject your application or invite you for an interview.

## Osteopathic Medical School

Doctors of Osteopathic Medicine (D.O.'s) are "complete physicians." This means that they are fully trained and licensed to diagnose illness, prescribe medication, and perform surgery. D.O.'s and allopathic physicians (M.D.'s) are the only two types of complete physicians in the United States. In California, as in most other states, the law accords holders of the D.O. and M.D. equal professional status and privileges as licensed physicians and surgeons. D.O.'s may practice all branches of medicine, including specialties like Pediatrics, Obstetrics and Gynecology, and Emergency Medicine.

To become a D.O., you must attend a School/College of Osteopathic Medicine. At the time of this catalog, 19 schools/colleges offered programs leading to the D.O. degree. The main difference between the training of osteopathic and allopathic physicians is that osteopathic medical students must take additional training in osteopathic manipulative medicine. To learn more about osteopathic medicine, students should visit the Web site of The American Association of Colleges of Osteopathic Medicine (AACOM).

To be admitted to a School/College of Osteopathic Medicine, a student must complete the recommended core curriculum listed above. As is the case for most health professional schools, students may be admitted without a baccalaureate degree. However, 97% of students enrolled in Osteopathic Medical Schools hold at least a baccalaureate degree. Most osteopathic medical schools do not specify a college mathematics requirement. However, it is recommended that students complete the same math courses that are required for admission to an allopathic medical school. In addition, like allopathic medical schools, some osteopathic medical schools also recommend or require upper division courses in biology and biochemistry.

Students seeking admission to osteopathic medical school must also take the Medical College Admissions Test (MCAT). Most osteopathic medical schools subscribe to an application service called The American Association of Colleges of Osteopathic Medicine Application Service (AACOMAS). Therefore, applicants file one application, a single set of transcripts, and one set of MCAT scores to AACOMAS, and the service distributes these materials to each of the colleges designated on the application.

Like allopathic medical schools, osteopathic medical schools require letters of recommendation at some stage in the process. However, it is important to note that one of the letters must be from a practicing doctor of osteopathic medicine. Therefore, students thinking about applying to osteopathic medical school should try to make contact with a D.O. early in their undergraduate studies.

## Dental Schools

To become a dentist, students must complete a program leading to the D.D.S. (Doctor of Dental Surgery) or D.M.D. (Doctor of Dental Medicine) degree. Most dental school programs are four-year programs. However, a few dental schools (e.g., University of the Pacific) offer a three-year program. To be admitted to dental school, students must complete the

recommended core curriculum listed above. In addition, many dental schools recommend or require that students complete one or more of the following courses:

Code	Title	Units
BIO 22	Introductory Human Anatomy (anatomy)	4
BIO 131	Systemic Physiology (physiology)	4
BIO 184	General Genetics (genetics)	4
BIO 127	Developmental Biology (embryology)	4
CHEM 161	General Biochemistry (biochemistry)	3
STAT 1	Introduction to Statistics (statistics)	3

Dental school applicants must take the Dental Aptitude Test (DAT) which is given year-round by appointment on computers. The test should be taken at least 10 months prior to matriculation.

Most dental schools subscribe to an application service called the Associated American Dental Schools Application Service (AADSAS). Therefore, students applying to participating schools must complete a single initial application and submit a single set of transcripts and DAT scores to AADSAS. However, after reviewing a student's AADSAS application and DAT scores, most participating dental schools will require that students submit secondary applications and letters of recommendation.

## Pharmacy Schools

To become a pharmacist, students must complete a program leading to the Doctor of Pharmacy (Pharm.D.) degree. Some, but not all, schools require the Pharmacy College Admission Test (PCAT). Prerequisite coursework also varies by school. Therefore, you should check with your pre-health advisor and the school's Web site for information about standardized test and course requirements. Completion of the recommended core curriculum plus the following courses will satisfy course requirements for most pharmacy schools:

Code	Title	Units
BIO 22	Introductory Human Anatomy	4
BIO 131	Systemic Physiology	4
BIO 139	General Microbiology	4
COMS 4	Introduction to Public Speaking	3
ECON 1A	Introduction to Macroeconomic Analysis	3
MATH 26A	Calculus I for the Social and Life Sciences <sup>1</sup>	3 - 4
or MATH 30	Calculus I	
MATH 26B	Calculus II for the Social and Life Sciences	3 - 4
or MATH 31	Calculus II	
<b>Total Units</b>		<b>24-26</b>

<sup>1</sup> Some schools require only one semester of calculus (MATH 26A or MATH 30).

## Veterinary Schools

To become a veterinarian, students must complete a program of study leading to the Doctor of Veterinary Medicine (D.V.M.) degree. Although it is becoming less difficult to gain admission to any U.S. veterinary school without being a resident of the state in which the school is located, residents of California most often attend the School of Veterinary Medicine at UC Davis. Applicants to the UC Davis Veterinary School must

take the Graduate Record Examination (GRE) General Aptitude Test. The GRE must be taken no later than October 1 of the year preceding planned matriculation. Applicants to other veterinary schools are usually required to take the Veterinary College Admission Test (VCAT). Applicants to veterinary school must have formal animal/veterinary experience.

In addition to the recommended core curriculum listed above, students planning to attend the School of Veterinary Medicine at UC Davis should take the following courses:

Code	Title	Units
BIO 127	Developmental Biology	4
BIO 131	Systemic Physiology	4
BIO 184	General Genetics	4
CHEM 161	General Biochemistry	3
STAT 1	Introduction to Statistics	3
<b>Total Units</b>		<b>18</b>

## Optometry Schools

To become an optometrist, students must complete a program of study leading to the Doctor of Optometry (O.D.) degree. Applicants must take the Optometry Admissions Test (OAT). The OAT is administered twice a year, once in October and once in February. The test should be taken no later than the fall of the year preceding the intended date of matriculation (e.g., in Fall 2009 for admission in Fall 2010). Prerequisite course requirements vary by school. However, completion of the recommended core curriculum plus the following courses will satisfy course requirements for most optometry schools:

Code	Title	Units
BIO 22	Introductory Human Anatomy	4
BIO 131	Systemic Physiology	4
BIO 139	General Microbiology	4
CHEM 161	General Biochemistry	3
MATH 26A	Calculus I for the Social and Life Sciences <sup>1</sup>	3 - 4
or MATH 30	Calculus I	
MATH 26B	Calculus II for the Social and Life Sciences	3 - 4
or MATH 31	Calculus II	
STAT 1	Introduction to Statistics	3
<b>Total Units</b>		<b>24-26</b>

<sup>1</sup> Some schools require only one semester of calculus (MATH 26A or MATH 30).