

# **BROOKLYN COLLEGE PRE-HEALTH PROFESSIONS HANDBOOK**

## **PRE-HEALTH PROFESSIONS ADVISEMENT MISSION STATEMENT**

The pre-health professions advisement office seeks to produce the most qualified, confident and well-informed pre-health candidates for admission to professional schools, by providing guidance with regard to career choices, undergraduate course requirements, course sequences, research and internship possibilities, personal statement feedback, standardized test information, and professional school application procedures. The office seeks to maximize the success of each student in the pre-health programs by helping the students deal with academic challenges, by organizing review classes for standardized tests, and by fostering interactions between the students and successful health professionals.

The purpose of this handbook is to provide the Brooklyn College student who is interested in a career in the health sciences with a detailed path to follow in order to be fully prepared to enter a professional school. Pre-health professional programs leading to careers in the following fields will be discussed:

MEDICINE (ALLOPATHIC AND OSTEOPATHIC)  
DENTISTRY  
PHARMACY  
PHYSICIAN ASSISTANT  
OCCUPATIONAL THERAPY  
PHYSICAL THERAPY  
NURSING  
OPTOMETRY  
PODIATRY  
CHIROPRACTIC  
DIAGNOSTIC MEDICAL IMAGING (SONOGRAPHY, ETC.)  
VETERINARY MEDICINE

Before discussing the requirements for application to professional programs that lead to careers in the fields listed above, it is important that the student be aware of the following recommendations:

- ◆ The pre-health professions advisor should be seen at least once each semester; the advisor for the student's major department should be seen at least once each school year.
- ◆ All prerequisites required by the professional school should be completed prior to submitting an application, or the remaining prerequisites should be completed during the semester that the application is submitted.
- ◆ Applications should be completed as early as possible during the application cycle, because most professional schools have a "rolling admission" policy. The application should be submitted even if the standardized exam score that may be required is not yet available or the exam is scheduled for a later date.
- ◆ In order not to jeopardize TAP awards, pre-health professions students who intend to graduate from Brooklyn College, have more than 60 credits and have declared a major will find it advantageous to discuss their situation with the Office of Financial Aid, since the health profession prerequisites may be treated as electives and TAP may not pay for these courses.

## 1. MEDICINE

There are two types of medical training provided by U.S. medical schools: most medical schools provide allopathic medical training, and graduates of these schools receive an MD degree. A smaller number of medical schools provide osteopathic medical training, and graduates of these programs receive a DO degree. In order to be considered for admission to a U.S. medical school, whether allopathic or osteopathic, a student normally will have satisfactorily completed the requirements for a bachelor's degree with a major in any field, as well as the so-called "pre-med" requirements. In addition, the MCAT

examination should have been taken, volunteer experience and research experience should be possessed by the applicant, and the required letters of recommendation must be on file with the pre-health professions advisor.

### Pre-Medical Requirements

The following courses are recommended in order to fulfill the prerequisites for entry to most U.S. medical schools. The pre-med student should try to avoid taking any science classes during the summer or at another school. If the student has received AP credit for any of the science courses listed below, the student should take more advanced courses in that subject at Brooklyn College. The student is urged to check the requirements for each specific medical school to which the student may want to apply:

Chemistry 1 or 1.1 and 1.2

Chemistry 2

Chemistry 51 and 52

Biology 29, 34.1, 17, 29.1, 17.1

Physics 1 and 2

Math 2.9 and 3.3

English 1 and 2

NOTE: Math 2.9 is a prerequisite or co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

It is suggested that the courses above be taken in the following order:

SEMESTER 1: Chemistry 1 or 1.1, Biology 29 and 34.1, Math 2.9, English 1

SEMESTER 2: Chemistry 2 or 1.2, Biology 17 and 29.1, Math 3.3, English 2

SEMESTER 3: Chemistry 51 (or Chemistry 2 if Chemistry 1.2 was taken in prior semester), Biology 17.1

SEMESTER 4: Chemistry 52 (or Chemistry 51, if Chemistry 2 was taken in prior semester)

SEMESTER 5: Physics 1 (and Chemistry 52 if Chemistry 51 was taken in prior semester)

SEMESTER 6: Physics 2

The MCAT examination should be taken following SEMESTER 6 (for information about the exam, go to: [www.aamc.org](http://www.aamc.org) and click on “MCAT”; application to medical schools should also be completed following SEMESTER 6. For admission to allopathic medical schools, the so-called AMCAS “primary application” is completed on-line by again going to [www.aamc.org](http://www.aamc.org) and clicking on “AMCAS”. Instructions are also provided at the AMCAS site by clicking on “APPLICANTS”. Questions regarding the application process should be directed to the pre-health professions advisor. “Secondary applications” are submitted later to the individual medical schools, along with the letters of recommendation. If the student wishes to apply to osteopathic or “DO” schools, a different on-line “primary application” is available at: [www.aacom.org](http://www.aacom.org).

Sometime during the sophomore year or during the summer following the sophomore year, the student should become involved in both volunteer and research work. Volunteer work should preferably involve a clinical setting such as a clinic, hospital, nursing home or hospice and the work should place the student in contact with patients. Research work can involve lab work at the college, in which the student participates in a research project, mentored by a professor at Brooklyn College; alternatively, the student can become involved in medically-related research outside the college. Students who have conducted biomedical research and have been accepted to a U.S. medical school are eligible to be nominated for the prestigious Salk Scholarship, which provides \$2,000 per year for four years. Please consult the pre-health professions advisor to find out more about this award.

At any time during the student's college career, the student should look for opportunities to obtain a letter of recommendation. Medical schools in general would like at least two letters from science professors, one letter from a non-science professor and letters from individuals who are familiar with the work of the student in volunteer and research settings.

It is important for the pre-med student to recognize that admission to a U.S. medical school is extremely competitive. Therefore, it is essential that the student strive to obtain the highest grades possible in all courses, but especially in the courses that are pre-med requirements. For admission to an allopathic school, a GPA of at least 3.6 is usually required, as well as a score of at least 30 on the MCAT examination. For admission to an osteopathic school, a GPA of at least 3.4 and an MCAT score of at least 25 is usually required.

## 2. DENTISTRY

In order to be considered for admission to a U.S. dental school, the applicant should have satisfactorily completed the requirement for a bachelor's degree with a major in any field as well as the "pre-dental" requirements. In addition, a score on the DAT examination must be submitted, evidence of volunteer or research work in a dental environment is highly recommended, and letters of recommendation must be submitted.

### Pre-Dental Requirements

The pre-dental requirements are identical to the pre-medical requirements described above. The student should, however, check with the individual dental schools to confirm that he or she is fulfilling the requirements for that particular school.

The order in which these courses should be taken is identical to that shown above for the pre-med requirements.

At the end of SEMESTER 6, the student should take the DAT examination (go to [www.adea.org](http://www.adea.org) and look for information on the DAT exam ) and submit an application for

admission to dental school. Applications for dental school admission are handled by a centralized on-line application service, AADSAS.

Letters of recommendation are a very important part of the application process for dental school admission. It is imperative that the applicant identify at least two science professors and one non-science professor as recommenders. In addition, a letter from at least one dentist that knows the student well from the student's outside activities should be submitted. A list of recommenders is required as part of the on-line application; a Matching Form should be downloaded and given to each recommender. The recommender's letter should be attached to this form and sent to the pre-health professions advisor, who will forward the letters with attached Matching Form to AADSAS.

### 3. PHARMACY

Essentially all U.S. pharmacy schools offer a Pharm.D. degree, which requires 6 years of study after high school. The first two years involve "pre-professional studies" and the remaining four years involve "professional studies." The Brooklyn College student who desires a career in pharmacy can apply for a transfer to a pharmacy school before he or she obtains a bachelor's degree or the student can first obtain the bachelor's degree and then apply to pharmacy school. In either case, if the student has completed the pre-professional portion of the pharmacy school program at Brooklyn College, and has obtained a score on the PCAT exam, the student can apply for admission to a pharmacy school and, if accepted, will usually have to complete the remaining four years of the professional program. Certain pharmacy schools have accelerated programs in which the transfer student can complete all the requirements for the Pharm.D. in less than four years. The student is urged to examine the requirements for the particular pharmacy schools in which he or she is interested.

#### Pre-Pharmacy Requirements

The following courses are recommended in order to fulfill the prerequisites for admission to the professional portion of the pharmacy program in most pharmacy schools. However, the student is urged to check the pre-professional requirements for each particular pharmacy school in which the student has an interest.

Chemistry 1 or 1.1 and 1.2  
Chemistry 2  
Chemistry 51 and 52  
Biology 29, 34.1, 17, 29.1, 17.1  
PE 22.75  
Physics 1  
Math 2.9 and 3.3  
English 1 and 2  
Economics 10.1 or 20.1

NOTE: Math 2.9 is a prerequisite or a co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

The order in which these courses should be taken is similar to that recommended for pre-med requirements, shown above.

Admission to the professional portion of a Pharm.D. program as a transfer student is highly competitive. The student should strive to obtain the best grades possible in the courses listed under “pre-pharmacy requirements.” In addition, a good score on the PCAT is essential for the transfer student.

The student who wishes to eventually transfer to a pharmacy school should gain some experience working in a pharmacy as an assistant.

Letters of recommendation are a very important component of the transfer student’s application for admission to pharmacy school. The student should look at the types of letters of recommendation that are suggested for pre-med and pre-dental students.

#### 4. PHYSICIAN ASSISTANT

A physician assistant is trained to provide a wide range of medical duties from the diagnosis and treatment of primary care patients to attending to medical emergencies, acting as first or second assistants in major surgery and pre- and postoperative care. The professional program to become a physician assistant is generally about 2.5 years long. To enter such a program, the student can either transfer from Brooklyn College after having completed the prerequisite courses, or complete the bachelor’s degree in any major at Brooklyn College and complete the physician assistant prerequisites, and then enter a physician assistant program. In those professional schools that offer a master’s degree, a bachelor’s degree from Brooklyn College would normally be required. In professional schools that offer a bachelor’s degree, the student can transfer from Brooklyn College without having completed the requirements for a degree from Brooklyn College as long as the physician assistant prerequisites have been completed.

##### Pre-Physician Assistant Requirements

The following courses are recommended in order to fulfill the prerequisite requirements for admission to a physician assistant program. The student is urged to check the pre-professional requirements of each professional school in which the student may be interested.

Chemistry 1 **or** Chemistry 1.1 and 1.2

Chemistry 2

Biology 29, 34.1, 17, 29.1, 17.1

Biology 52 and 52.1

PE 22.75

HNS 22.71

HNS 22.72

Math 2.9

Psychology 1.1

Psychology 30 **or** 20 and 20.6 (20 plus 20.6 constitute Life-Span Psychology)

English 1 and 2

Humanities or Social Science courses (can be satisfied by 2 Core Courses)

One 3-or 4-credit upper division science course (for example, Chem 50 or 51, Chem 57.1, Bio 35)

In addition, the applicant must have 100 hours of direct patient contact in a healthcare setting and 50 hours of volunteer work in a non-clinical setting.

NOTE: Math 2.9 is a prerequisite or a co-requisite for Chemistry 1.

Chemistry 1 (or Chemistry 1.1), Biology 29, Biology 34.1, Math 2.9 and English 1 should be taken in SEMESTER 1.

## 5. OCCUPATIONAL THERAPY

Occupational therapists work with people following mental or physical ill health or disability to maximize their skills and abilities. Occupational therapists give people the “skills for the job of living” necessary for living meaningful and satisfying lives. An occupational therapy professional program generally takes 2-3 years to complete. Professional schools that offer this program require a bachelor’s degree before admission. In addition to the required prerequisite courses, a score on the Graduate Record Examination (GRE) must be submitted with the application.

### Pre-Occupational Therapy Requirements

The following courses are recommended in order to fulfill the prerequisite requirements for admission to an occupational therapy program. The student is urged to check the pre-professional requirements of each professional school in which the student is interested.

Chemistry 1 **or** 1.1 and 1.2 **or** Psychology 65.1

Biology 3 or 4

PE 22.75

HNS 22.71

HNS 22.72

Math 2.9

Psychology 1.1, 20, 20.6, 30

Economics 30.2 **or** Psychology 40.1 or HNS 60

Sociology 5 **or** Anthropology 1

Chemistry 1 (or Chemistry 1.1), Biology 3, and Math 2.9 should be taken in SEMESTER 1.

In order to increase the chances of admission to an occupational therapy program, the student is advised to obtain volunteer experience in a clinical setting related to occupational therapy.

## 6. PHYSICAL THERAPY

Physical therapists provide services that help restore function, improve mobility, relieve pain and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They restore, maintain and promote overall fitness and health. Their patients may include accident victims and individuals with disabling conditions such as low-back pain, arthritis, heart disease, fractures, head injuries and cerebral palsy.

A physical therapy professional program has a duration of 2.5-3 years. An undergraduate student wishing to enter such a program does not have to possess a bachelor's degree but must have the prerequisite requirements (see below) and must have taken the GRE examination. In addition, a minimum of 50 hours of volunteer experience in a physical therapy setting is generally required prior to admission.

### Pre-Physical Therapy Requirements

The following courses are recommended in order to fulfill the prerequisite requirements for admission to a physical therapy program. The student is urged to check the pre-professional requirements of each professional school in which the student is interested.

Chemistry 1 or 1.1 and 1.2

Chemistry 2

Biology 3 and 4

PE 22.75

HNS 22.71

HNS 22.72

Physics 1 and 2

Math 2.9

Psychology 1.1 and any other 3 credit psychology course

Economics 30.2 or Psychology 40.1 or HNS 60

English 1

Humanities or Social Sciences: 9 credits of junior/senior courses

NOTE: Math 2.9 is a prerequisite or co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

Chemistry 1 (or Chemistry 1.1), Biology 3, Math 2.9 and English 1 should be taken in SEMESTER 1.

Additional courses that are recommended are organic chemistry, physical education and computer science

## 7. NURSING

Brooklyn College does not prepare a student interested in a nursing career to take the RN licensing examination. However, the Brooklyn College student interested in becoming a nurse can complete the prerequisite requirements for admission to a professional school that offers an accelerated nursing program. To be admitted to such a program, the student must possess a bachelor's degree in any major and must have completed the prerequisite requirements. The pre-nursing student should be aware of an agreement between Brooklyn College and Downstate's College of Nursing, which provides an automatic acceptance to the accelerated nursing program at Downstate if the Brooklyn College student graduates with at least a 3.3 GPA.

### Pre-Nursing Requirements

The following courses are recommended in order to fulfill the prerequisite requirements for admission to an accelerated nursing program. The student is urged to check the pre-professional requirements of each professional school in which the student is interested.

Chemistry 5 and 50

Biology 3 and 4

PE 22.75

HNS 22.71

HNS 22.72

Biology 52 and 52.1

Psychology 1.1 and any other 3 credit psychology course

Sociology 5 and Anthropology 1 (or 6 credits of Sociology or Anthropology)

English 1 and 2

Economics 30.2 **or** Psychology 40.1 or HNS 60

Humanities **or** Social Sciences: 12 credits of junior/senior courses

Chemistry 5, Biology 3 and English 1 should be taken in SEMESTER 1.

## 8. OPTOMETRY

Doctors of Optometry are independent primary health care providers who examine, diagnose, treat and manage diseases and disorders of the visual system, the eye and associated structures as well as diagnose related systemic conditions. Optometrists should not be confused with ophthalmologists, who are medically trained to perform surgery and prescribe medications.

The program leading to a Doctor of Optometry degree generally takes 4 years. Admission to such a program normally requires a bachelor's degree in any major. The pre-optometry student should be aware of the articulation agreement between Brooklyn College and SUNY College of Optometry which offers the possibility of a transfer from Brooklyn College to SUNY Optometry after 3 years of undergraduate work. The pre-health advisor can provide additional information about this option.

### Pre-Optometry Requirements

The following courses are recommended to fulfill the prerequisite requirements for admission to a professional optometry program. The student is urged to check the pre-professional requirements of each professional school in which the student is interested.

Chemistry 1 **or** 1.1 and 1.2

Chemistry 2

Biology 3 and 4 **or** 34.1, 29, 17, 29.1 and 17.1

Chemistry 51 and 52

Physics 1 and 2

Math 2.9 and 3.3

Psychology 1.1

English 1 and 2

Economics 30.2 or Psychology 40.1 or HNS 60

NOTE: Math 2.9 is a prerequisite or a co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

Chemistry 1 and Biology 3 or 34.1 and 29, Math 2.9 and English 1 should be taken in SEMESTER 1.

The OAT exam is required for admission to a school of optometry.

In addition to formal coursework, the pre-optometry student is essentially required to spend at least one day in each of a number of optometry practices to gain first-hand experience with the field.

### 9. PODIATRY

A Doctor of Podiatric Medicine is capable of preventing, diagnosing and treating diseases and disorders of the foot, ankle and lower extremities. It requires 4 years of study to obtain the DPM degree. Another 2 or 3 years of residency are also required before one can actually practice.

A bachelor's degree in any major is generally required for admission to a Doctor of Podiatric Medicine program. However, the student who is interested in podiatric medicine should be aware of the articulation agreement between Brooklyn College and The New York College of Podiatric Medicine, which offers the possibility of a transfer to NYCPM after 3 years of undergraduate work. The pre-health advisor can provide additional information about this option.

### Pre-Podiatry Requirements

The following courses are recommended to fulfill the prerequisite requirements for admission to a professional podiatry program. The student is urged to check the pre-professional requirements of each professional school in which the student is interested.

Chemistry 1 **or** 1.1 and 1.2

Chemistry 2

Chemistry 51 and 52

Biology 34.1, 29, 17, 29.1 and 17.1

Physics 1 and 2

Math 2.9

English 1 and 2

NOTE: Math 2.9 is a prerequisite or a co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

Chemistry 1, Biology 34.1 and 29, Math 2.9 and English 1 should be taken in SEMESTER 1.

In addition to the coursework listed above, the applicant for podiatry school should submit a score on either the MCAT or DAT exam.

The applicant should have experience in the field of podiatry by having shadowed one or two podiatrists for an amount of time sufficient to provide the applicant with exposure to a variety of procedures.

## 10. CHIROPRACTIC

Chiropractic is a health care profession whose purpose is to diagnose and treat mechanical disorders of the spine and musculoskeletal system with the intention of affecting the nervous system and improving health.

A minimum of 90 semester hours are required for admission to a chiropractic college, but a bachelor's degree in any major is recommended.

### Pre-Chiropractic Requirements

The following courses are recommended to fulfill the prerequisite requirements for admission to a chiropractic program. The student is urged to check the pre-professional requirements for each professional program in which the student is interested.

Chemistry 1 **or** Chemistry 1.1 and 1.2

Chemistry 2

Biology 3 and 4

Chemistry 51 and 52

PE 22.75

Physics 1 and 2

Math 2.9

Psychology 1.1

English 1 and 2

Humanities or Social Sciences: 15 credits of junior/senior courses

NOTE: Math 2.9 is a prerequisite or a co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

Chemistry 1, Biology 3, Math 2.9 and English 1 should be taken in SEMESTER 1.

## 11. DIAGNOSTIC MEDICAL IMAGING (RADIOLOGIC TECHNOLOGY)

Medical imaging refers to the techniques and processes used to create images of the human body (or parts thereof) for clinical purposes or medical science. Radiology is the medical specialty directing medical imaging technologies to diagnose and sometimes treat diseases. A diagnostic radiologist is a medical doctor who has completed 4 years of medical school and 5 years of residency. A radiologic technologist usually has a 2-year degree and is certified to perform the scans but the interpretation of the results is performed by the radiologist. A Brooklyn College student who desires to become a radiologist should follow the guidelines given above for a career in medicine. The student who wishes to become a radiologic technologist does not have to obtain a bachelor's degree but can transfer to a diagnostic imaging program after fulfilling the prerequisite requirements.

### Pre-Sonography Requirements

The following courses are recommended to fulfill the requirements for admission to a sonography program. If the student wants to become a radiologic technologist who specializes in a different imaging technique, such as MRI, PET scan or CAT scan, the student is urged to contact individual schools that provide these programs in order to know what the prerequisite requirements are.

Chemistry 1 **or** Chemistry 1.1 and 1.2

Chemistry 2

Biology 3 and 4

PE 22.75

HNS 22.71

HNS 22.72

Physics 1

Math 2.9

Psychology 1.1

English 1 and 2

NOTE: Math 2.9 is a prerequisite or co-requisite for Chemistry 1 and is a prerequisite for Physics 1.

Chemistry 1 (or Chemistry 1.1), Biology 3, Math 2.9 and English 1 should be taken in SEMESTER 1.

## 12. VETERINARY MEDICINE

Veterinary medicine is the application of medical, diagnostic and therapeutic principles to companion, domestic, exotic, wildlife and production animals.

Admission to a college of veterinary medicine does not necessarily require a bachelor's degree, but the student transferring from an undergraduate institution must carefully check with each veterinary college in which the student is interested to see that the proper prerequisites have been taken.

### Pre-Veterinary Requirements

The following courses are recommended to fulfill the prerequisite requirements for admission to most veterinary colleges. The student is urged to check the prerequisite requirements for admission to each veterinary college in which the student is interested.

Chemistry 1 **or** 1.1 and 1.2

Chemistry 2

Biology 34.1, 29, 17, 29.1, 17.1

Biology 45 and 45.1

Biology 52 and 52.2

Biology 58

Chemistry 51 and 52

Chemistry 57

Physics 1 and 2

Math 2.9

English 1 and 2

Economics 30.2 or Psychology 40.1 or HNS 60

The primary application for admission to veterinary colleges is filed with the Veterinary Medical College Application Service (VMCAS). The student should first read the information at [www.aavmc.org](http://www.aavmc.org).

Any of three types of standardized examinations may be accepted by veterinary schools. The three examinations are VCAT, MCAT, and the GRE. The pre-veterinary student should make a decision of which examination should be taken based on a survey of the requirements for the veterinary schools in which the student is interested.

The veterinary school applicant should have had considerable experience working with veterinarians in a clinical setting.