

**BROOKLYN COLLEGE
PRE-HEALTH PROFESSIONS HANDBOOK
(JANUARY 2021 EDITION)**

OUR MISSION STATEMENT

The Pre-Health Professions Advisement office at Brooklyn College aims to produce highly qualified, confident and well-informed pre-health candidates for admission to professional schools. Our office seeks to maximize the success of each pre-health student by providing guidance with regard to career choices, undergraduate course requirements, course sequences, research and internship opportunities, personal statement review and feedback, interview preparation, standardized test education, and professional school application procedures

SPECIAL NOTE:

Recent changes to the MATH, CHEM and PHYSICS requirements by the respective departments at Brooklyn College will impact those students who are preparing for careers in Medicine, Dentistry, Pharmacy, Optometry, Podiatry, Chiropractic and Veterinary Medicine.

MATH:

A new course, MATH 1006 (College Algebra for Precalculus, 3 credits) is required of students who are not cleared to take MATH 1011 (Precalculus). This course will therefore serve as a prerequisite for MATH 1011. Courses MATH 1021 (Precalculus MATH A) and MATH 1026 (Precalculus MATH B) were previously required of students who were not cleared to go directly into MATH 1011, and completion of both of these courses satisfied the Precalculus requirement. These courses have been phased out and are no longer available.

Clearance to take Precalculus will no longer be based on a Math Assessment Test. Instead, clearance will depend on Regents scores and high school GPA. For specific requirements, see: "Important: New Guidelines for Placement into Precalculus and Calculus-1" on the Mathematics Department website.

CHEM:

Effective Fall 2021:

CHEM 1100 (General Chemistry 1) will be split into a separate lecture (CHEM 1200) and a separate lab (CHEM 1201).

CHEM 2050 (General Chemistry 1B) will be split into a separate lecture (CHEM 2060) and a separate lab (CHEM 1201).

CHEM 2100 (General Chemistry 2) will be split into a separate lecture (CHEM 2200) and a separate lab (CHEM 2201).

The MATH prerequisites for CHEM 1050 and CHEM 1100 have changed. In order to register for either CHEM course, MATH 1006 is required.

A new course, CHEM 2110 (Principles of Chemical Reactivity, 2 credits), will become a second prerequisite for CHEM 3511 (Organic Chemistry 1 lecture), in addition to CHEM 2100 (General Chemistry 2). Therefore, if students do not want to be delayed in taking CHEM 3511, they should consider taking both CHEM 2110 and CHEM 2100 in the same semester, or enrolling in CHEM 2110 during a winter or summer session AFTER completing CHEM 2100.

PHYS:

A grade of B in MATH 1011 (Precalculus) or in MATH 1012 (Precalculus with recitation) is required for enrollment in PHYS 1100.

The purpose of this handbook is to provide the Brooklyn College student who is interested in a health science career with a detailed path to follow (including prerequisite coursework) 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:

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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, prior to registering for courses for the next 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. **If prerequisites were completed in prior years, the age of these courses may disqualify them from being counted. It is important that the student check the admission requirements of each program to which the student is applying.**

◆ Letters of recommendation (LOR) are an important part of a student's application to health professions schools. When written by individuals who know the student well, they can provide important information about the student that is not provided by grades and test scores. Therefore, upon completion of a science or non-science course in which the student did well and where a relationship was developed with the professor, the student should respectfully request that the professor provide an LOR on the student's behalf. The student should inform the recommender that the letter is confidential and that the student has signed a waiver of confidentiality. The professor should be instructed to print the letter on letterhead stationery, sign and date the letter, and send it to the Pre-health Professions Advisement Office. All LOR's are considered to be confidential and are kept in a student's file, located securely in our offices. The same instructions apply to LOR's written in the context of clinical experience, research, volunteering, and other community service activities.

◆ **Students who are thinking of utilizing the "F replacement policy" at Brooklyn College should consult with their pre-health advisor before doing so. Utilizing this policy is very risky for pre-health students, since the F-grade is NEVER actually replaced and remains on the student's transcript, where it will be counted toward the student's GPA by health professions schools.**

◆ 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, 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.

◆ Many students do not possess reading skills that are sufficient for a high level of performance on the reading section of a number of standardized exams that are required by health professions schools. Therefore, it is highly recommended that these students make a habit of reading high quality material on a regular basis, such as The New York Times, Atlantic Monthly, American Heritage Magazine, Scientific American and the Economist magazines. Inquire in the Brooklyn College Library about free subscriptions to some of these.

◆ Many students do not possess the study and time-management skills that are sufficient to insure a high level of academic performance. Therefore, it is highly recommended that these students purchase a copy of "Study Smarter, Not Harder" by Kevin Paul and published by Self-Counsel Press.

◆ It is highly recommended that all students enroll in the following courses during their matriculation at Brooklyn College for their future success as practitioners:

Statistics[±], Epidemiology (HNSC 2120), and Medical Ethics (PHIL 3316)

[±] There are three courses in this handbook that are listed as "statistics" courses that will satisfy a statistics requirement for a number of health professions programs. There are probably additional courses in other departments that will also satisfy this requirement. Please discuss this with the pre-health advisor. Students who wish to enroll in the statistics course offered by the Health and Nutrition department (HNSC 3300) must fulfill the prerequisite of having completed nine credits of advanced electives within the HNSC department (See current Bulletin).

1. MEDICINE

There are two types of medical training provided by U.S. medical schools: allopathic and osteopathic. 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 will have been taken, the applicant will have completed meaningful volunteer experience and research experience and the required letters of recommendation must be on file with the pre-health professions advisor.

Pre-Medical Requirements

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. Ideally, students should enroll in all prerequisite science courses at Brooklyn College, regardless if taken in High School for AP credit. Some medical schools do not accept AP/CLEP credits, even if the student's Undergraduate Institution allowed them to be transferred onto their transcript as college credits. The student is urged to check the requirements for each specific medical school to which the student may want to apply.

****IMPORTANT NOTE**** Look at the list of Highly Recommended Courses on page 4. To ensure success on the revised MCAT (as of 2015), all pre-med students are encouraged to enroll in Biochemistry 1 & 2, Introduction to Psychology, Social Psychology, and Psychology Statistics. The new MCAT includes two sections which critically test the students' knowledge of the above mentioned course topics.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- Or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a chemistry course that will provide a foundation for organic chemistry
CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One year of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

MATH 1201 Calculus 1 (Math 3.3)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

Highly Recommended Courses for Pre-medical and Pre-dental students

The following courses are not required for admissions to medical or dental schools, but are strongly suggested as they incorporate topics tested on the **MCAT** and **DAT** entrance examinations:

BIOL 2010 **Advanced Cell and Molecular Biology**

CHEM 4570 **Biochemistry 1 lecture and lab, 5-credits** OR

CHEM 4571 **Biochemistry 1 lecture, 3-credits**

CHEM 4581 **Biochemistry 2**

ECON 3400 or PSYC 3400 or HNSC 3300 **Statistics**

HNSC 2120 **Introduction to Epidemiology**

HNSC 2300 **Human Physiology lecture**

KINS 3281 **Human Anatomy and Physiology 1 (lecture and lab)**

KINS 3285 **Human Anatomy and Physiology 2 (lecture and lab)**

PHIL 3316 **Medical Ethics**

PSYC 1000 **Introduction to Psychology**

PSYC 2100 **Social Psychology**

PSYC 2810 **Abnormal Psychology**

SOCY 1101/ANTH 1100 **Introductory Sociology/Anthropology** (to better understand the various socio-economic populations and disparities that exist among them)

Details about the MCAT examination can be accessed by going to the AAMC website (www.aamc.org) and clicking on "MCAT". Students should become familiar with the structure and nature of this exam because of its emphasis on critical thinking and analysis skills, two fundamental skillsets necessary for all future physicians who wish to excel during medical school and on the standard licensing exams (USMLE.)

The Critical Analysis and Reasoning Skills section of the MCAT examination requires reading skills that are not possessed by a large number of pre-med students. It is highly recommended that students make a habit of reading high quality material on a regular basis, such as **The New York Times, Atlantic**

Monthly, Scientific American, American Heritage, and Economist magazines as soon as they start the freshman year. A course emphasizing reading skills is usually offered to freshmen and sophomores during the Spring semester each year. Please inquire.

The MCAT examination is normally taken in the summer following SEMESTER 6, assuming that the student has finished the pre-med requirements by that time. The 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 and clicking on “AMCAS”. Detailed instructions regarding how to fill out each section of the primary application are provided by typing “2020 (or later) AMCAS Applicant Guide” on Google. Further 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.

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, and for admission to an osteopathic school, a GPA of at least 3.4 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 requirements 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

For the most part, the pre-dental requirements are identical to the pre-medical requirements described in section 1. Recently, a number of dental schools have added courses to their admission requirements; some of these courses are Biochemistry, Anatomy, Physiology, and Microbiology. Therefore, students are urged to check with the individual dental schools to confirm that he or she is fulfilling the requirements for that particular school.

Ideally, students should enroll in all prerequisite science courses at Brooklyn College, regardless if taken in High School for AP credit. Some dental schools do not accept AP/CLEP credits, even if the student’s Undergraduate Institution allowed them to be transferred onto their transcript as college credits. The student is urged to check the requirements for each specific dental school to which they may want to apply.

In the summer following SEMESTER 6, the pre-dental student will normally take the DAT examination (go to 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. The recommender's letter should be sent to the Pre-Health Professions Advisement office, where it will be included as part of a letter packet that is sent to AADSAS.

3. PHARMACY

Essentially all U.S. pharmacy schools offer a PharmD 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 PharmD in less than four years. Admission to the professional portion of a PharmD 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 exam** 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.

Pre-Pharmacy Requirements

Because the pre-professional requirements for admission to the professional portion of PharmD programs can vary considerably depending on the pharmacy school, the student is urged to check the pre-professional requirements for each particular pharmacy school in which the student has an interest.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a Chemistry course that will provide a foundation for organic chemistry

CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)
BIOL 1002 General Biology 2 (Biol 2.5)

Microbiology (lecture and lab)

BIOL 3003 General Microbiology lecture (Biol 52)
BIOL 3004 General Microbiology lab (Biol 52.2)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1
KINS 3285 Human Anatomy and Physiology 2

One semester of Physics (lecture and lab)

PHYS 1100 General Physics 1 (Physics 1)

One year of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)
MATH 1201 Calculus 1(Math 3.3)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)
ENGL 1012 English Composition 2 (Eng 2)

One semester of Macroeconomics or Microeconomics

ECON 2100 Elementary Macroeconomics (Economics 10.1)
-or-
ECON 2200 Elementary Microeconomics (Economics 20.1)

Speech

CASD 1707 Public Speaking (Speech 7)

4. PHYSICIAN ASSISTANT

A physician assistant is trained to provide a wide range of medical services, 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 programs to become a physician assistant are generally about 2.5 years long; some grant a Bachelor's degree and others grant a Master's degree. To enter a bachelor's 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. It is highly recommended that the student complete the bachelor's degree because of the competitiveness of the applicants to these programs. In those professional schools that offer a master's degree, a bachelor's degree from Brooklyn College would normally be required. In addition, a score on the Graduate Record Examination (GRE) may be required.

Students applying to PA programs should understand that, because of the competitive nature of the admissions process for these programs, it is to their advantage to complete as many upper-level science courses as possible. Examples of these courses are listed at the end of the prerequisite coursework requirements.

In addition, the applicant must have at least 250 hours of direct patient contact in a healthcare setting and at least 150 hours of volunteer work in a non-clinical setting. The applicant should check the clinical hours requirement for each program of interest, since this can vary over a wide range, up to as many as 1,000 hours.

Pre-Physician Assistant Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Microbiology (lecture and lab)

BIOL 3003 General Microbiology lecture (Biol 52)

BIOL 3004 General Microbiology lab (Biol 52.2)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

Psychology

PSYC 1000 Intro Psychology (Psy 1.1)

-and-

PSYC 2810 Abnormal Psychology (Psy 30)

-or-

PSYC 2200 Life Span Development (Psy 20.9)

NOTE: PSYC 2210 Child Psychology (Psy 20) and PSYC 3260 Psychology of Aging (Psy 20.6) together will substitute for PSYC 2200

Statistics

PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

6 credits of Humanities or Social Science courses: can be satisfied by 2 Pathways Courses

One or more 3 or 4 credit upper level science courses: The course list below is a suggested example of upper level science courses, and is by no means an exhaustive list of all options available. You should be aware of the prerequisites for each upper-level science course.

CHEM 3511 & CHEM 3512 Organic Chemistry 1 lecture + lab

CHEM 3415W Analytical Chemistry writing-intensive

BIOL 3011 Genetics

BIOL 3006 or 3007W Evolution or writing-intensive Evolution

BIOL 4010W Macromolecular Structure and Bioinformatics writing-intensive

As mentioned above, applicants to PA programs face stiff competition. Therefore, it is recommended that applicants to PA programs also consider applying to accelerated nursing programs. Information regarding these programs is provided on page 11 of this handbook.

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 leading to a Master’s degree generally takes 2-3 years to complete. Professional schools that offer this program require a bachelor’s degree before admission. A score on the **GRE examination** is usually not required, but the student is urged to check the requirements of the schools to which they apply, because a few OT programs do require a GRE score for admission. The Pre-Health Professions office recommends that all pre-OT students take the GRE and submit their scores as part of the application, due to the competitive advantage it will afford. Some OT programs require one semester of Physics. Students who complete advanced science courses are viewed as more competitive applicants; therefore it is recommended that students consult individual schools for suggestions about “extra coursework” or any other activity that may give students a competitive advantage.

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.

Pre-Occupational Therapy Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

Chemistry or Behavioral Neuroscience

CHEM 1040 General Chemistry for Health-Related Professions (Chem 5)

-or-

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

-or-

PSYC 3600 Behavioral Neuroscience (Psy 65.1) **[Please NOTE: This course requires a prerequisite of Mind, Brain and Behavior (PSYC 2600)]**

It is very important that the pre-OT student knows that the Biology Department now requires CHEM 1040 or CHEM 1100 or CHEM 1050 as a prerequisite or co-requisite in order for the student to be able to register for BIOL 1001. Therefore, if the student chooses to NOT take any of the Chemistry options above and instead chooses to take PSYC 2600 followed by PSYC 3600, the student will be unable to register for BIOL 1001.

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

One semester of College Math

MATH 1006 or MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

Psychology courses

PSYC 1000 Intro Psychology (Psy 1.1)

PSYC 2810 Abnormal Psychology (Psy 30)

PSYC 2200 Lifespan Development (Psy 20.9)

NOTE: PSYC 2210 Intro Child Psychology (Psy 20) and PSYC 3260 Psychology of Aging (Psy 20.6) together can be substituted for PSYC 2200

Statistics

ECON 3400 Introduction to Economic and Business Statistics (Econ 30.2)

-or-

PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)

-or-

HNSC 3300 Introduction to Biostatistics for the Health Sciences (Hns 60)

Sociology or Anthropology (any 3-credit course provided by a Sociology or Anthropology Department will satisfy this requirement; the courses below are suggestions)

SOCY 1101 Introduction to Sociology (Soc 5)

-or-

ANTH 1100 Culture and Society

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

In order to be a more competitive applicant for OT programs, it is highly recommended that a pre-OT student take KINS 4200W (Physiology of Exercise), followed by KINS 4402 (Fitness Assessment and Exercise Prescription)

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 leading to a Doctor of Physical Therapy degree is generally of 2.5-3 years duration. Most pre-physical therapy students choose to major in Exercise Science. An undergraduate student wishing to enter a DPT program may not have to possess a bachelor's degree (though it is highly recommended), 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 (a mix of in-patient and outpatient) is generally required prior to admission. Students should check the requirements of the PT program to which they want to apply, specifically for the number and types of letters of recommendation necessary to complete their application.

Pre-Physical Therapy Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

Psychology – PSYC 1000 and any other 3-credit psychology course

Statistics

ECON 3400 Introduction to Economic and Business Statistics (Econ 30.2)

-or-

PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)

-or-

HNSC 3300 Introduction to Biostatistics for the Health Sciences (Hns 60)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

9 credits of Junior/Senior courses in major or in same discipline

In order to be a more competitive applicant for PT programs, it is highly recommended that a pre-PT student take (A) KINS 4200W (Physiology of Exercise), followed by KINS 4402 (Fitness Assessment and Exercise Prescription), and (B) KINS 3290 (Applied Musculoskeletal Anatomy), followed by KINS 4250 (Biomechanics).

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 a conditional acceptance to the accelerated nursing program at Downstate if the Brooklyn College student meets the following criteria:

- Graduates from Brooklyn College with a minimum GPA of 3.3.
- Takes the ATI version of Test of Essential Academic Skills (ATI TEAS). As per the articulation agreement with SUNY Downstate College of Nursing, applicants to the accelerated nursing program are required to take the **Test of Essential Academic Skills (TEAS)** to be considered for admission. The TEAS consists of four content areas: Math, Reading, Science, English and

Language Usage. Applicants must receive scores of at least 80% on Math, Reading and Science.

- Registers with the Pre-Health Professions Advisement office as a pre-nursing student.
- Obtains a letter of certification from Pre-Health Director to be included upon submission of application.

Pre-Nursing Requirements

The following courses are the recommended prerequisite requirements for admission to an accelerated nursing program. Check the admission requirements of the nursing schools in which you are interested. Nursing schools may require the **ATI TEAS (formerly the TEAS V) or the NLN PAX-RN Test**, or may not require any examination at all.

One comprehensive semester of Chemistry (lecture and lab)

CHEM 1040 General Chemistry for Health-related Professions (Chem 5)

-or-

CHEM 1100 General Chemistry 1 (Chem 1)

-or-

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

One comprehensive semester of Organic Chemistry (lecture and lab)

CHEM 2500 Organic Chemistry for Health-related Professions (Chem 50)

♦ **This course is not a prerequisite for Downstate's accelerated nursing program.**

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

♦ **These courses are not prerequisites for Downstate's accelerated nursing program; however, BIOL 1001 and BIOL 1002 are prerequisites for Microbiology at Brooklyn College**

Microbiology (lecture and lab)

BIOL 3003 General Microbiology lecture (Biol 52)

BIOL 3004 General Microbiology lab (Biol 52.2)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

Once a pre-nursing student has completed KINS 3281 and 3285, or HNSC 2300 (Human Physiology (lecture), the student can register for HNSC 7213X, Human Pathophysiology, a graduate course offered only in Fall, that may exempt the student from taking this course in an accelerated nursing program.

Psychology

PSYC 1000 Intro Psychology

PSYC 2200 Lifespan Development

NOTE: PSYC 2210 Child Psychology (Psy 20) and PSYC 3260 Psychology of Aging (Psy 20.6) together will substitute for PSYC 2200

Sociology and Anthropology (6 credits in total are required from any combination of these disciplines); Any course provided by a Sociology or Anthropology Department will satisfy this requirement. The courses below are suggested but not required.

SOCY 1101 Introduction to Sociology (Soc 5)

ANTH 1100 Culture and Society

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)
ENGL 1012 English Composition 2 (Eng 2)

Statistics

ECON 3400 Introduction to Economic and Business Statistics (Econ 30.2)
-or-
PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)
-or-
HNSC 3300 Introduction to Biostatistics for the Health Sciences (Hns 60)

One semester of College Math

MATH 1006 (Algebra for Precalculus) or MATH 1011 Precalculus (Math 2.9) or
MATH 1012 (Precalculus with recitation)

Humanities or Social Sciences

12 credits of junior/senior courses; PATHWAYS courses should satisfy this requirement.

Nutrition (optional)

HNSC 2210 (Human Nutrition)

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.

In addition to formal coursework, the pre-optometry student is essentially required to spend a meaningful period of time in each of a number of optometry practices to gain first-hand experience in the field.

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

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

Pre-Optometry Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)
- or -
CHEM 1050 General Chemistry 1A (Chem 1.1)
CHEM 2050 General Chemistry 1B (Chem 1.2)
CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a Chemistry course that will provide a foundation for organic chemistry

CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One year of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

MATH 1201 Calculus 1 (Math 3.3)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

Psychology

PSYC 1000 Intro Psychology (Psy 1.1)

Statistics

ECON 3400 Introduction to Economic and Business Statistics (Econ 30.2)

-or-

PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)

-or-

HNSC 3300 Introduction to Biostatistics for the Health Sciences (Hns 60)

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.

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.

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

In addition to the coursework listed below, the applicant for podiatry school should submit scores from the **MCAT exam**.

Pre-Podiatry Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a Chemistry course that will provide a foundation for organic chemistry

CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

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.

Students wishing to pursue chiropractic medicine should gain adequate exposure to the field by volunteering or shadowing a chiropractor.

As is the case with admissions to all pre-health professions schools, letters of recommendation should be obtained from both academic and clinical environments which will be included as part of the application to graduate school.

Pre-Chiropractic Requirements

The student is urged to check the requirements for each specific school to which the student may want to apply.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a Chemistry course to provide a foundation for organic chemistry

CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Human Anatomy and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

Psychology

PSYC 1000 Intro Psychology (Psy 1.1)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

Humanities or Social Sciences: 15 credits of junior/senior courses; PATHWAYS courses should satisfy this requirement.

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 the use of 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. It is important for the student interested in this profession to gain familiarity with this profession by volunteering or working in an office where diagnostic medical imaging is performed.

As is the case with admissions to all pre-health professions schools, letters of recommendation should be obtained from both academic and clinical environments, to be included as part of the application to graduate school.

Pre-Sonography Requirements

If the student wants to become a radiologic technologist who specializes in a different imaging technique, such as X-Ray, MRI, PET scan or CAT scan, the student is urged to contact individual schools that provide these programs and become familiar with their prerequisite requirements for admission.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (1 Chem.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Human Physiology and Physiology

KINS 3281 Human Anatomy and Physiology 1

KINS 3285 Human Anatomy and Physiology 2

One semester of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Physics 1)

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

Psychology

PSYC 1000 Intro Psychology (Psy 1.1)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

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. Most veterinary schools require the Graduate Record Examination (GRE).

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

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

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.

Pre-Veterinary Requirements

The student is urged to check the prerequisite requirements for admission to each veterinary college in which the student is interested.

One year of General Chemistry (lecture and lab)

CHEM 1100 General Chemistry 1 (Chem 1)

- or -

CHEM 1050 General Chemistry 1A (Chem 1.1)

CHEM 2050 General Chemistry 1B (Chem 1.2)

CHEM 2100 General Chemistry 2 (Chem 2)

One semester of a Chemistry course that will provide a foundation for organic chemistry

CHEM 2110 (Principles of Chemical Reactivity)

One year of Organic Chemistry (lecture and lab)

CHEM 3511 Organic Chemistry 1 lecture

CHEM 3512 Organic Chemistry 1 lab

-and-

CHEM 3521 Organic Chemistry 2 lecture

CHEM 3522 Organic Chemistry 2 lab

One year of General Biology (lecture and lab)

BIOL 1001 General Biology 1 (Biol 1.5)

BIOL 1002 General Biology 2 (Biol 2.5)

Zoology (lecture and lab)

BIOL 2001 Organismic Biology II, Zoology (Biol 45)

BIOL 2002 Animal Form and Function Laboratory (Biol 45.1)

Microbiology (lecture and lab)

BIOL 3003 General Microbiology lecture (Biol 52)

BIOL 3004 General Microbiology lab (Biol 52.2)

Genetics

BIOL 3011 Genetics (Biol 58)

Biochemistry (lecture and lab)

CHEM 4570 Biochemistry 1 (Chem 57)

One year of General Physics (lecture and lab)

PHYS 1100 General Physics 1 (Phy 1)

PHYS 2100 General Physics 2 (Phy 2)

One semester of College Math

MATH 1011 Precalculus (Math 2.9) or MATH 1012 (Precalculus with recitation)

One year of English Composition

ENGL 1010 English Composition 1 (Eng 1)

ENGL 1012 English Composition 2 (Eng 2)

Statistics

ECON 3400 Introduction to Economic and Business Statistics (Econ 30.2)

-or-

PSYC 3400 Statistical Methods in Psychological Research (Psy 40.1)

-or-

HNSC 3300 Introduction to Biostatistics for the Health Sciences (Hns 6)

13. HEALTH AND NUTRITION

Students who are seeking a career in Public Health and Nutrition and advanced degrees in these areas should inquire with the Health and Nutrition Department. The department recently merged with the Kinesiology Department, so an expanded list of courses should be available in the near future within the Health and Nutrition Department.

14. SPEECH LANGUAGE PATHOLOGY, AUDIOLOGY

Students who intend to become speech pathologists or audiologists should inquire with the Communication Arts, Sciences and Disorders Department.