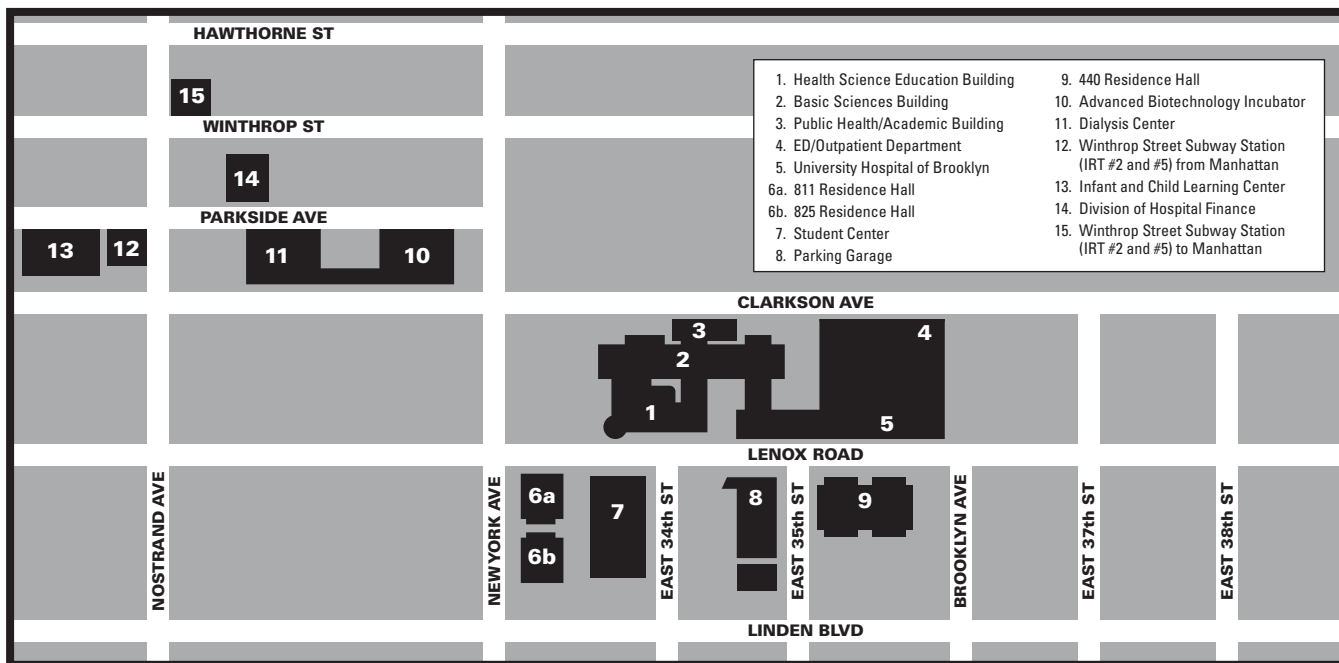


**BULLETIN 2016-2018**

# **SUNY Downstate Medical Center**

College of Medicine

School of Graduate Studies



## Transportation to SUNY Downstate

The SUNY Downstate Admissions Office is located at 450 Clarkson Avenue, just off New York Avenue (Building 2).

### BY AUTOMOBILE

#### From Manhattan:

**Manhattan Bridge:** exit onto Flatbush Avenue. Continue approximately three and one-half miles to Parkside Avenue. Turn left onto Parkside Avenue and travel four blocks to New York Avenue. Turn right at New York Avenue and continue one block to Clarkson Avenue.

**Brooklyn Bridge:** stay to the left at the end of the bridge, following the ramp to Boerum Place, which becomes Adams Street. Continue along Adams Street to Atlantic Avenue. Turn left onto Atlantic Avenue and continue to Flatbush Avenue. Turn right onto Flatbush Avenue and continue approximately two and one-half miles to Parkside Avenue. Turn left onto Parkside Avenue and travel four blocks to New York Avenue. Turn right at New York Avenue and continue one block to Clarkson Avenue.

**Brooklyn-Battery Tunnel (toll):** exit onto the Brooklyn-Queens Expressway. Continue approximately one mile, staying to the left, and exit onto Prospect Expressway. Travel three exits to the Fort Hamilton Parkway exit. Continue through two traffic lights to Caton Avenue. Turn left onto Caton Avenue, and continue sixteen blocks to Flatbush Avenue. Turn left onto Flatbush Avenue and continue two blocks to Parkside Avenue. Turn right onto Parkside Avenue and travel four blocks to New York Avenue. Turn right at New York Avenue and continue one block to Clarkson Avenue.

#### From Staten Island and Newark International Airport:

Verrazano Narrows Bridge (toll): follow bridge to Route 278, the Gowanus Expressway. Travel approximately five miles to the Prospect Expressway exit. Continue on the Prospect Expressway three exits to the Fort Hamilton Parkway exit. Travel along East 5 Street through two traffic lights to Caton Avenue. Turn left onto Caton Avenue, and continue sixteen blocks to Flatbush Avenue. Turn left onto Flatbush and continue two blocks to Parkside Avenue. Turn right onto Parkside Avenue and travel four blocks to New York Avenue. Turn right at New York Avenue and continue one block to Clarkson Avenue.

#### From Long Island and Airports:

**Southern Long Island and JFK:** West on Belt Parkway to North Conduit Boulevard exit (Exit 17W). Continue on North Conduit Boulevard for about 3/4 mile. Fork left onto Linden Boulevard, and take Linden Boulevard to New York Avenue. Right two blocks on New York Avenue to Clarkson Avenue.

**Northern Long Island and LaGuardia:** Take Grand Central Parkway to Jackie Robinson Pkwy (formerly Interboro Pkwy). Continue to Pennsylvania Avenue exit. Follow Pennsylvania to Linden Boulevard, turn right onto Linden. Take Linden Boulevard to New York Avenue. Right two blocks on New York Avenue to Clarkson Avenue.

### PARKING

Valet Parking is available Mondays through Fridays from 6:00 a.m. to 6:00 p.m., located in front of the 445 Lenox Road hospital entrance at the valet parking booth. The fee is \$10.00 (this service is not available on weekends or holidays). When the valet parking service is not available, a limited number of spaces for visitors are available at a nominal cost at the Center's Parking Garage on East 34th Street, between Linden Boulevard and Lenox Road. There are also several private parking lots in the area.

### BY RAILROAD

#### Long Island Railroad

Take any train to the Jamaica station. Change to Brooklyn-bound train (track 3). Take to the Flatbush Avenue terminal. Follow subway directions from there.

#### Metro-North Railroad

Take any train to Grand Central Terminal. Change to Brooklyn-bound 4 or 5 trains. Follow subway directions from there.

### BY SUBWAY

*During rush hour,* take the IRT Flatbush Avenue Line (#2 Seventh Avenue or #5 Lexington Avenue) trains to the Winthrop Street station. [Take any IRT Brooklyn-bound train (#2, 3, 4, or 5) to Nevins Street in Brooklyn, changing there for a #2 or #5 marked "Flatbush Avenue." Note that the # 5 runs only during rush hours.] Exit at Nostrand and Parkside avenues. Cross Nostrand Avenue and walk one block on Parkside Avenue until it ends at New York Avenue. Turn right onto New York Avenue. Cross New York Avenue and walk east on Clarkson Avenue until the entrance at 450 Clarkson Avenue. The Admissions Office is located at 450 Clarkson Avenue.

*Nights and outside of rush hours,* take the subway to Church Street. Walk three short blocks east on Church Avenue to New York Avenue, left three blocks to Clarkson Avenue, right to 450 Clarkson Avenue. Or transfer to an eastbound B-35 bus to the northbound B-44 at Church and New York avenues. (Downstate students and employees can call 718-270-2626 to arrange for transportation from Church Avenue.)

### BY BUS

The B-12 and northbound B-44 buses stop at the corner of Clarkson and New York Avenues. The following lines connect with the B-12 along Clarkson Avenue: B-41, B-44, B-46, and B-49.

# Table of Contents

## INTRODUCTION

Administration .....	4
SUNY Downstate Medical Center .....	5
Mission, Vision, and Values .....	5
Founding of Downstate Medical Center .....	6

## COLLEGE OF MEDICINE

Admissions .....	8
Academic Program .....	12
Clinical Training Facilities .....	19
Support Services for Students .....	20
Academic Advisement	
Office of Academic Development	
Office of Minority Affairs	
Residency Information and Advisement	
Student Counseling	
Student Health	
Other Campus Organizations .....	23

### See Student Affairs/Bursar and Financial Aid web pages for the following information:

Tuition and Fees  
Student Financial Aid

## SCHOOL OF GRADUATE STUDIES

Graduate Study .....	23
MD/PhD Program	
Postdoctoral Fellows	
Admissions .....	25
Programs of Study .....	26
Courses of Instruction .....	28
Joint Doctoral Program in Biomedical Engineering .....	33

### See Student Affairs/Bursar and Financial Aid web pages for the following information:

Financial Information

## UNIVERSITY RESOURCES

Facilities for Instruction .....	36
Basic Sciences Building	
Health Science Education Building	
Medical Research Library of Brooklyn	
Student Computing	
University Services .....	38
Banking	
Bookstore	
Bursar's Office	
Chaplain Services	
Children's Center	
Faculty-Student Association	
Office of Diversity and Inclusion	
Office of Student Affairs	
Office of the Registrar	
Residential Life and Services	
Parking	
University Police	

### See the Student Handbook for the following information:

Student Life  
    Student Center  
    Student Organizations

## FACULTY

Alphabetical Listing .....	41
----------------------------	----

## STATE UNIVERSITY OF NEW YORK

State University Campuses .....	58
Education Rights and Education Law .....	59

<b>CONTACTS</b> .....	60
-----------------------	----

<b>INDEX</b> .....	61
--------------------	----

# Administration

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SUNY Downstate Administration

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*Lists as of 2/19/2013*

# SUNY Downstate Medical Center

SUNY Downstate Medical Center—formally known as the State University of New York Health Science Center at Brooklyn—is one of four academic health centers within the 64-unit State University of New York. SUNY Downstate comprises the College of Medicine, School of Graduate Studies, College of Nursing, College of Health Related Professions, School of Public Health, University Hospital of Brooklyn, a major research center, and several biotechnology incubators.

SUNY Downstate is a major provider of medical education, health care, and research. It is the focal point of a health education network that encompasses numerous other healthcare sites. Downstate grants BS, MS, MPH, MD, DrPH, DPT, and PhD degrees. It has a total student body of over 1,800 and roughly 4,100 faculty (including full-time, part-time, and voluntary members).

Research is an integral part of a Downstate education. In 1998, one of its faculty in physiology and pharmacology, Dr. Robert F. Furchgott, received the Nobel Prize for medical research.

## MISSION, VISION AND VALUES

### Mission

SUNY Downstate Medical Center — Brooklyn's Academic Medical Center

- To provide outstanding education of physicians, scientists, nurses and other healthcare professionals
- To advance knowledge through cutting-edge research and translate it into practice
- To care for and improve the lives of our globally diverse communities
- To foster an environment that embraces cultural diversity

### Vision

We will be nationally recognized for improving people's lives by providing excellent education for healthcare professionals, advancing research in biomedical science, health care and public health, and delivering the highest quality, patient-centered care.

### Values

**PRIDE** To take satisfaction in the work we do every day, and to value our collective contributions to the Downstate community.

**Professionalism** We commit to the highest standards of ethical behavior and exemplary performance in education, research, and patient care.

**Respect** We value the contributions, ideas and opinions of our students, coworkers, colleagues, patients and partnering organizations.

**Innovation** We research and develop new and creative approaches and services for the anticipated changes in healthcare.

**Diversity** We embrace our rich diversity and commit to an inclusive and nurturing environment.

**Excellence** We commit to providing the highest quality of education and service to our students, patients and community by holding ourselves, our coworkers and our leaders to high standards of performance.

## SUNY DOWNSTATE COLLEGE OF MEDICINE

The College of Medicine grants the MD degree; it also sponsors, with the School of Graduate Studies, a combined MD/PhD degree. The College of Medicine curriculum is organ-based. Medical students can earn a Master of Public Health degree from the School of Public Health, while at the same time earning their MD degree. Some students choose to complete the MPH by taking summer courses starting before the first year of medical school. Others take a year off between the third and fourth year of medical school to complete the MPH.

## SCHOOL OF GRADUATE STUDIES

The School of Graduate Studies offers three PhD degree-granting programs: Molecular and Cellular Biology, Neural and Behavioral Science, and a joint PhD program in Biomedical Engineering in collaboration with the Brooklyn campus of NYU Polytechnic University. Students should consult the website [www.downstate.edu/grad](http://www.downstate.edu/grad) for the most recent information on program offerings.

## ACCREDITATION

SUNY Downstate is accredited by the Middle States Commission on Higher Education. The College of Medicine is fully accredited by the Liaison Committee on Medical Education.

# The Founding of Downstate Medical Center

SUNY Downstate Medical Center had its beginnings as a small charitable medical service set up in 1856 by a group of German physicians. This free dispensary, organized to treat indigent German-Americans living in Brooklyn, was staffed by five physicians. The original intention was to build a large hospital to care for the German population of Brooklyn. But changing population trends, which brought a largely Irish patient load to the dispensary, necessitated a revision of this plan.

In 1857, physicians from the German General Dispensary, then located on Court Street, resolved to organize a charitable institution in the City of Brooklyn, to be called St. John's Hospital. From November 7 until December 23 of that year, the dispensary was called The St. John's Hospital; on December 23, the name of the hospital was changed to The Long Island Hospital and Medical College. It was on this date that a medical college with a hospital was first projected.

Dr. Louis Bauer and Dr. John Bryne, the prime movers in the establishment of the medical college, were trained in Europe, where it was customary for medical schools to be associated with hospitals. The two physicians naturally wanted to adopt this system to prepare the future physicians of Brooklyn. A bill to incorporate the Long Island College Hospital of the City of Brooklyn was introduced in the State Legislature on January 20, 1858, and passed on March 6. The hospital's charter empowered 25 regents to operate a hospital and to confer degrees on candidates 21 years of age or older, who had passed three years of preceptorship under a practicing physician and completed two courses of lectures at the hospital.

Almost immediately after the charter was signed, the Perry Mansion, located in Brooklyn Heights, was purchased to house the new medical complex. The official inauguration of the Long Island College Hospital took place June 3. Financial difficulties beset the new institution almost immediately, slowing down efforts to open the medical school. The hospital itself was forced to close in late September 1859. Meanwhile, several outstanding physicians were secured to fill the professorships at the college, and on March 29, 1860, the institution reopened, following financial arrangements underwriting the expense of the collegiate department and settling various liens.

The following day, the instruction of students began. The first teaching faculty was a distinguished one. Most eminent of all was Dr. Austin Flint, Sr., professor of practical medicine and pathology, who had been a professor of medicine at Rush Medical College in Chicago.

A medical student's training in 1860 consisted of his three-year preceptorship under the direction of a practicing physician and attendance at two courses of lectures of at least sixteen weeks each. The lectures that were given one year were repeated the next, sometimes verbatim, so many students took their first course of lectures at one school and their second at another. The first class had 57 students, as well as a number of graduates of other institutions. The first commencement took place July 24, 1860, with 21 students graduating.

In 1861, in anticipation of the medical needs of the Civil War, the curriculum included a one-month course on military surgery, dissection, and clinical instruction on the wards. By 1869, major changes were introduced into

the teaching curriculum. Daily class examinations were instituted to ensure more exact knowledge, especially in the demonstrative and elementary branches. Another change, made in 1872, was the establishment of a reading and recitation term that began early in October and extended to the beginning of the regular term in March. This term included dissection and clinical instruction as well as reading and quizzes.

By 1879, the faculty of the Long Island College Hospital concluded that the system of teaching medicine in the United States was radically wrong. They debated the possibility of instituting a compulsory, full-graded, three-year course of instruction, but abandoned the idea because of their fears that such a plan would result in the loss of many students, when the college was entirely dependent for its existence on students' fees. Certain changes were made, however, to improve the curriculum. The regular term was lengthened from sixteen weeks to five months, but the four-month reading and recitation term remained optional. Thus, a total of eighteen months' instruction was available to any student electing two regular and two reading and recitation terms.

Between 1888 and 1897, the Long Island College Hospital grew rapidly. The Hoagland Laboratory building, built primarily for research in bacteriology, was constructed. At its opening, it was considered one of the best-equipped buildings for research and medical training in the country. In December 1897, the Polhemus Memorial Clinic Building was completed. The new building, eight stories high, was erected on the southwest corner of Henry and Amity streets.

By this time, New York State law

required that a student take three courses of lectures in three different years. The system of having a regular term of five months and an optional reading term was retained. The entering class of 1897-1898 began the first four-year graded course of instruction. The reading term was abolished, and the school year lasted seven months. In 1897, the student fees were raised to \$185 and \$190. In the period from 1889 to 1909, the average number of students in the school was 310, and the average number in the graduating class was 62.

During the years immediately before and after World War I, many additional changes occurred at Long Island College Hospital. Admission was opened to women; postgraduate teaching was instituted; a new wing increased the number of beds to 500; and affiliations were established with other Brooklyn hospitals.

In 1930, the college and hospital were separated from one another so that each would be under its own governing board. The college was conducting much of its clinical teaching in other hospitals throughout the borough, and it seemed preferable that it not be governed by the board of only one hospital. The college became the Long Island College of Medicine.

Other changes occurring during the 1930s included the construction of the Polak Memorial Laboratory, housing laboratories in bacteriology, histology, physiology, pathology, gynecology, and surgery. In 1935, 500 beds at Kings County Hospital were set aside in a college division for the clinical instruction of students.

In the 1940s, full-time chiefs were appointed in all the clinical departments, training in psychiatry was offered within a separate department, and Maimonides Hospital and the Veterans Administration Hospital in Fort Hamilton became affiliates, along with a number of other local hospitals. In 1946, the third-year curriculum was changed so that nearly two-thirds of the work consisted of clinical clerkships.

In 1945, the college purchased a six-and-a-half-acre tract of land that eventually became the site of Downstate Medical Center. After approval by a faculty committee and the board of trustees of the Long Island College of Medicine, the board of managers of the Alumni Association, the trustees of the State University of New York, and the State Board of Regents, the State Legislature in 1950 passed a bill legalizing the merger of the Long Island College of Medicine and the State University to form Downstate Medical Center.

The establishment in 1966 of the School of Graduate Studies, the College of Health Related Professions, and the College of Nursing; the construction of the Basic Sciences Building in 1956; student residence halls in 1965; State University Hospital in 1966; the Student Center in 1967; the nurses' residence in 1968; and the Health Science Education Building in 1992 completed the transition of the medical school as it is now known from its early days as the German General Dispensary on Court Street.\*

*Excerpted with permission from the New York State Journal of Medicine, July 1976. It was reprinted in Alumni Today, Spring 1996, with the permission of the Medical Society of the State of New York.*

*\*Update: Since this account was written, the medical center has expanded even further. The School of Public Health was established in 2009.*

# College of Medicine

## MD DEGREE

*The College of Medicine is accredited by the Liaison Committee on Medical Education and the Middle States Commission on Higher Education.*

## ADMISSIONS

Admission information is revised annually and is available in the *Medical School Admission Requirements Handbook*, published by the Association of American Medical Colleges, and from SUNY Downstate Medical Center's Admissions Office. Current information about Downstate's admissions procedures, requirements, and policies are available on its website: [www.downstate.edu](http://www.downstate.edu) in the section titled "Prospective Students."

## ADMISSIONS POLICIES

The Committee on Admissions considers the total qualifications of each applicant without regard to sex, race, color, creed, national origin, religion, age, sexual orientation, marital status, or disability. Decisions regarding admission are based on multiple factors, including prior academic performance; completion of the courses required for admission; the potential for academic success, including performance on standardized tests such as the Medical College Admission Test (MCAT); communication skills; and character, personal skills, health-related experiences, and motivation for a career in medicine. New York State residents are given admissions preference, although well-qualified out-of-

state applicants are also accepted. We welcome and encourage applications from women and members of groups underrepresented in medicine.

## ADMISSIONS REQUIREMENTS

An applicant must have completed at least 90 semester credits of study in a regionally accredited (e.g., Middle States Association of Colleges and Schools) college or university, as listed by the Council for Higher Education Accreditation (CHEA). Admissions preference is given to applicants who have earned or will have earned a bachelor's degree in a regionally accredited college or university.

Admissions preference is also given to applicants who have completed prerequisite courses in four-year colleges/

universities in the United States (not in study abroad programs); and to applicants who have completed science prerequisites in a traditional classroom setting (not through distance learning).

The Committee on Admissions looks favorably on a program of study that includes at least one year of college mathematics and advanced science subjects. A course in biochemistry is strongly recommended. Other desirable courses include anatomy, physiology, histology, cell biology, genetics, neuroscience, a course in statistics or biostatistics, and courses in the humanities and social sciences. The Admissions Committee also seeks individuals who have a demonstrated commitment to community/social service outreach activities.

## PREREQUISITE COURSES

	Semester credits
English *	6
General Biology or Zoology including labs	8
General Physics including labs	8
General or Inorganic Chemistry including labs**	8
Organic Chemistry including labs	8

*Note: If the applicant's college follows the quarter system, usually three courses equate to two courses under the semester system. Applicants should check very carefully to be sure that they have completed the required number of courses plus labs. If the college has separate lecture and lab courses, the applicant may need to take more than the indicated number of credit hours above to fulfill course sequences.*

*\*In general, the Committee does not accept English courses taken abroad to fulfill the English admission requirement. Courses that have the English department prefix are accepted to fulfill the English requirement. If an applicant has an interdisciplinary course or if their college or university accepts other courses to fulfill writing or English requirements, they should submit a statement from their college as part of the application process (see the website for instructions).*

*\*\* If the college/university offers an intensive one-semester general or inorganic chemistry course with lab for qualified students, and considers this equivalent to the traditional two-semester course, applicants may use this to satisfy our requirement for general chemistry. However, they should also take a higher-level chemistry course, preferably biochemistry. In addition, they should indicate on the Supplemental Application that the one-semester course is an advanced general or inorganic chemistry course, and attach a copy of the catalog description or a letter from the Department of Chemistry verifying this (see Admissions website for instructions).*



## APPLICATION PROCEDURES

### HOW TO APPLY

SUNY Downstate participates in the American Medical Colleges' Application Service (AMCAS) system. Applicants should complete the AMCAS web application at [www.amcas.org](http://www.amcas.org).

Early application is strongly recommended. Applicants should complete the AMCAS web application prior to September 1.

The applicant is responsible for submitting official transcripts from all universities attended to AMCAS. Official university transcripts should not be sent to the SUNY Downstate Admissions Office unless a specific transcript has been requested.

### MEDICAL COLLEGE ADMISSIONS TEST (MCAT)

The MCAT exam is administered multiple times from January through early September. The Committee on Admissions recommends that applicants take the MCAT in the Spring prior to the application year. The MCAT scores submitted must be no older than three years prior to the date of the applicant's planned enrollment. Applications are not reviewed without MCAT scores. Component scores for each MCAT series are looked at individually, and all of the scores on MCATs taken by the applicant are reviewed.

For additional useful information, including registration, test dates, fees, fee waivers, and practice questions, visit [www.aamc.org/students/applying/mcat/](http://www.aamc.org/students/applying/mcat/)

Or contact:

Association of American Medical Colleges

Medical College Admission Test  
Email: [mcataamc.org](mailto:mcataamc.org)

See the College of Medicine website at [www.downstate.edu](http://www.downstate.edu) to determine if a previous MCAT score is considered current for this application cycle.

### LETTERS OF RECOMMENDATION

All letters (packet or individual) must be submitted on letterhead, and must be signed by the letter writer. Letters not meeting these requirements will not be considered. All letters must be submitted electronically—through the AMCAS letter service, Virtual Evals, or Interfolio.

If an applicant submits a packet of letters (e.g., from health professions advisor or health professions committee) through AMCAS, Virtual Evals, or Interfolio, we accept all the letters included in the packet. Applicants should ensure that at least one of the letters is from a science professor who has taught them in a biology, chemistry, or physics course. Guidelines for Letters of Recommendation may be found on the website.

### SUPPLEMENTAL APPLICATION AND FEE

All applicants must complete a SUNY Downstate Supplemental Application (secondary) in order to have a complete application on file. Upon our receipt of a verified AMCAS application, applicants are sent an email with the link to SUNY Downstate's Supplemental Application. A completed Supplemental Application must be received by SUNY Downstate, in order to have a completed application for review by the Admissions Committee.

### SUNY DOWNSTATE APPLICATION PROCESSING FEE

All applicants must pay a nonrefundable Supplemental Application processing fee by credit card, or have an approved AMCAS fee waiver.

Applicants may submit their application fee by credit card (Visa or MasterCard), following the instructions on the SUNY Downstate College of Medicine website.

### APPLICATION DEADLINES

The deadline for submitting an AMCAS application is December 1. The deadline for having a completed application on file in the Admissions Office is January 15. Incomplete applications will not be reviewed after this date. Current information about our admissions deadlines are available on the Admissions website for the College of Medicine.

### APPLICATION CHECKLIST

The requirements for a complete application are posted on the Admissions website annually. A complete application currently consists of the following:

1. American Medical College Application Service (AMCAS) Application.
2. SUNY Downstate Medical Center Supplemental Application also known as the "secondary" application.
3. A nonrefundable Supplemental Application Processing Fee or an approved AMCAS fee waiver.
4. Medical College Admission Test (MCAT) scores as required.
5. Letter of recommendation from premedical advisor or committee or two individual faculty letters as required. Read the requirements for letters of recommendation on the SUNY Downstate website very carefully as your letter may not be accepted if it does not meet our guidelines.

## **STUDENTS EDUCATED ABROAD**

For students who are educated abroad, a minimum of two full-time semesters (one academic year) of college study at a CHEA regionally accredited college/university in the United States prior to application is required. In addition, the applicant must demonstrate English proficiency, both verbally and in writing, if the prior medium of instruction was in another language. If a substantial amount of the applicant's education has been completed abroad, or if the applicant has completed science prerequisites abroad, he/she is required to submit a course-by-course educational credentials evaluation from a National Association of Credential Evaluation Services (NACES) agency, such as World Educational Services, to enable the Committee on Admissions to assess prior academic performance.

## **APPLICATION STATUS**

It is the applicant's responsibility to ensure that a complete application is on file.

Once an application becomes complete, it will be reviewed, and applicants will be notified of their status, by email. Applications are not reviewed in the order in which they are completed, so an applicant may not receive communication immediately. See the Downstate Admissions website for more information.

Applicants should not telephone the Admissions Office regarding their application status. Downstate will make every effort to keep applicants informed of the status of their application by email.

## **INTERVIEWS**

Invitations for a personal interview are offered only to applicants whose qualifications are competitive for admission. The interview provides a means for the College of Medicine and the applicant to learn more about each other. It also offers the opportunity for discussion and clarification of information from the application. Applicants are invited for interviews beginning in September. See the Downstate Admissions website for more information.

## **ACCEPTANCES**

Acceptance letters are mailed beginning in mid-October and continue until the class is filled ("rolling admissions"). An alternate list is maintained throughout the summer, until registration. Applicants accepted for admission are required to reserve their place in the class by submitting a deposit between April 15-30, which will be applied toward the first semester's tuition. The deposit is nonrefundable after April 30.

## **CERTIPHI SCREENING CRIMINAL BACKGROUND CHECK**

All acceptance letters are conditional pending a satisfactory criminal background report.

In addition, all accepted students are required to complete the American Heart Association's Healthcare Provider course. This is the only course that is accepted.

See the American Heart Association's website for a list of where courses are given within the applicant's geographic location. Additional requirements for matriculation, such as satisfactory health forms, submission of official transcripts, and any other requirements, are specified in the acceptance letter.

## **DEFERRALS**

Accepted applicants may request a deferral for one year in order to participate in educational activities or social service projects. See the Downstate Admissions website for more information.

## **WITHDRAWALS**

Applicants who decide to withdraw their application from consideration should notify the Office of Admissions immediately by sending an email to [medadmissions@downstate.edu/](mailto:medadmissions@downstate.edu/).

## **RE-APPLICANTS**

Re-applicants must adhere to the same policies, procedures and deadlines as first-time applicants. Please see the website for more detailed instructions.

## **EARLY DECISION**

An applicant interested in SUNY Downstate may apply as an Early Decision applicant and receive the admissions decision by October 1 of the application year. If the applicant is not accepted as of October 1, he/she may then also apply to other medical schools as desired. All requirements for Early Decision are the same as regular admissions, but the deadlines differ. See the Admissions website for additional information.

## **MD/PHD PROGRAM**

The College of Medicine and the School of Graduate Studies jointly sponsor a program leading to a combined MD/PhD degree. This dual-degree program combines a medical education with an intensive research experience. It is designed for students who are interested in pursuing a career in academic medicine. Students are supported with a stipend and a tuition scholarship throughout the duration of the program.

Applicants to this program must apply for admission separately to both the College of Medicine and the School of Graduate Studies. They are considered for the combined MD/PhD as part of

the admissions process in both schools. A completed application should be on file as early as possible. For current information about deadlines, priority deadlines, and application information, please see the Admissions website.

To obtain a School of Graduate Studies application and a letter of recommendation form, go to [www.downstate.edu/grad](http://www.downstate.edu/grad). When filing your AMCAS application, you should indicate “Combined Medical Degree/PhD.”

### **MD/MPH PROGRAM**

This is a concurrent degree program (two degrees pursued simultaneously) in the College of Medicine and the School of Public Health. Course offerings have been synchronized so that students may receive both degrees at the end of four years. The emphasis of the MPH program is on urban health issues. Students may choose to complete the MPH program in one of five core areas: Biostatistics, Community Health Sciences, Environmental and Occupational Health Sciences,

Epidemiology, or Health Policy and Management. For more information about the MPH program, including interviews with the MD/MPH students and/or the MD/MPH application, visit [www.downstate.edu/publichealth/](http://www.downstate.edu/publichealth/).

Two separate applications are required: MD through AMCAS; and MPH locally. When filing the AMCAS application, indicate “Combined Medical Degree/Graduate.” For more information about application deadlines and procedures, see the MD/MPH website in the School of Public Health.

### **TRANSFER ADMISSIONS POLICY**

Admission to advanced standing at the College of Medicine is limited to U.S. citizens or permanent residents who are currently registered, matriculated, in good standing, and in attendance as pre-clerkship medical students in an LCME (Liaison Committee on Medical Education) accredited College of Medicine in the United States.

Individuals who have earned the MD degree are not considered for transfer. Applications are accepted to the third-year class only.

The Admissions Committee takes into consideration as much information as possible regarding an applicant’s total qualifications for the study and practice of medicine. Decisions regarding admission are based on a number of factors, including prior academic performance, particularly in medical school; letters of recommendation; Medical College Admissions Test (MCAT) scores; Step 1 of the United States Medical Licensing Exam (USMLE); and communication skills, character, personal skills and motivation for medicine, as demonstrated through letters of recommendation and the personal interview.

## **TRANSFER ADMISSIONS REQUIREMENTS**

### **Premedical Education**

Only applicants who qualify for admission to the first-year class, in terms of premedical education, will be considered for admission to the third-year class. For more detailed information, please see the “Transfer Admissions” section of the Admissions website.

### **Medical Education**

In addition to meeting all premedical requirements, applicants for admission to the third-year class must have satisfactorily completed a curriculum comparable to the pre-clerkship curriculum at SUNY Downstate in an LCME-accredited medical school.

### **Transfer Application Procedures**

Information about available positions, transfer application procedures, and requirements may be found in the “Transfer Admissions” section of the Admissions website.

# Academic Program

The primary goal of the College of Medicine is to graduate excellent physicians. Whether the student's ultimate goal is general or specialty practice, research, medical administration or academic medicine, the College provides a comprehensive educational experience for all students.

The education objectives of the curriculum are intended to provide students with the basics that they will need to embark upon graduate medical education in the field of their choice, and ultimately to become competent and compassionate physicians. To achieve these objectives, the College has set standards of knowledge and develops the skills and attitudes necessary to enable students to reach their goals.

## THE INTEGRATED PATHWAYS CURRICULUM

The Integrated Pathways Curriculum emphasizes learning across disciplines with a focus on understanding core principles. It is a competency-based curriculum designed to prepare graduates to enter any field of medicine and includes attaining the knowledge, attitudes, and skills contained within the six Domains of Competence. These Domains of Competence are modeled after the six competencies, which are followed by residency programs. Our curriculum provides a form of continuity for our graduates into residency, and better prepares them for the next stage of their careers.

## GATEWAYS 1, 2, 3, AND 4

The Gateways are times of evaluation located at the following points of the curriculum: before the second year of the Foundations of Medicine curriculum, before entering the Core Clinical phase, before the Advanced Clinical phase, and in the last year of the curriculum. These

## THE SIX DOMAINS OF COMPETENCE

Medical students are expected to master six domains of competence as a condition for graduation from SUNY Downstate Medical School. Each of the competencies encompasses broad educational objectives that together constitute a unified concept of the professionally competent medical school graduate.

### SYSTEMS-BASED PRACTICE

Graduates must demonstrate an awareness of the relationship between themselves and the patient, community, and health-care system as well as recognize the impact on optimizing patient care.

### PROFESSIONALISM

Graduates must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Graduates must also assess personal values and priorities in order to maintain an appropriate balance of personal and professional commitments.

### INTERPERSONAL AND COMMUNICATION SKILLS

Graduates must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients' families, and professional associates.

### PRACTICE-BASED LEARNING AND IMPROVEMENT

Graduates must be able to investigate and evaluate their patient-care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

### PATIENT CARE

Graduates must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

### MEDICAL KNOWLEDGE

Graduates must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g., epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

The Integrated Pathways Curriculum is a four-year curriculum and is divided into three parts:

- Foundations of Medicine
- Core Clinical Medicine
- Advanced Clinical Medicine

The curriculum requires 148 weeks of instruction and 148 credits for graduation.

are points in the curriculum at which students reflect on their mastery of the six competencies and faculty certify that the students meet expectations in the competencies and are ready to proceed to the next phase of the curriculum, or to graduate.

*Updated academic policies related to the Integrated Pathways Curriculum are published in the annual Student Handbook located on line at: [http://sls.downstate.edu/student\\_affairs/handbook.html](http://sls.downstate.edu/student_affairs/handbook.html)*

## FOUNDATIONS OF MEDICINE

The first component, or 18 months of the Integrated Pathways Curriculum, is entitled “Foundations of Medicine.” This pre-clerkship portion of the curriculum features larger, more integrated units rather than smaller more numerous individual blocks. Each unit teaches content related to normal physiology and disease or pathology in an integrated fashion. This structure allows connections to clinical material early in the curriculum. Clinical skills are taught as an integrated part of each unit. Each unit has a unit director and an interdisciplinary unit faculty. These are the six interdisciplinary units:

- Unit 1 Systems Overview: Human Structure and Function
- Unit 2 Basis of Disease I: Molecules to Cells
- Unit 3 Basis of Disease II: Infection and Host Defense
- Unit 4 Body Systems I: Gastrointestinal, Endocrine, and Reproduction
- Unit 5 Body Systems II: Cardiovascular, Renal, and Respiratory
- Unit 6 Body Systems III: Brain, Mind and Behavior

### FOUNDATION COURSES

	CREDITS
Human Structure and Function	7
Molecules to Cells	9
Infection and Host Defense	13
Gastrointestinal, Endocrine, and Reproduction	10
Cardiovascular, Renal, and Respiratory	13
Brain, Mind and Behavior	11
<b>Total</b>	<b>63 credits</b>

## CORE AND ADVANCED CLINICAL MEDICINE

The 3rd (Core Clinical Year) and 4th year (Advanced Clinical Year) include a required longitudinal experience in primary care. Beginning in 2016, the following requirements will be added to the 4th year: 4 weeks of emergency medicine (instead of 2 weeks), 4 weeks of a diagnostic imaging rotation, 2 weeks of critical care, and 4 weeks of translational science selectives.

CORE AND ADVANCED CLINICAL YEARS	NUMBER OF WEEKS IN ROTATION	CREDITS
Transition to Clerkships	1	1
Internal Medicine	8	8
Peri-operative Care, Anesthesia, & Surgery	10	10
Pediatrics	6	6
Women’s Health	6	6
Psychiatry	6	6
Neurology	4	4
Primary Care I: (includes Longitudinal Experience)	4	4
Primary Care II: Geriatrics/Palliative Care	4	4
Emergency Medicine	4	4
Subinternship (Medicine or Pediatrics)	4	4
Diagnostic Imaging	4	4
Critical Care	2	2
Translational Science Selectives	4	4
<b>Totals</b>	<b>67</b>	<b>67</b>

### ELECTIVES

Number of Required Clinical Elective Weeks/Credits	18	18
Total Foundations of Medicine		63 credits
Total Clinical Requirement (Core and Advanced Clinical Medicine and Clinical Electives)		85 credits
<b>Total Requirement for Graduation</b>		<b>148 credits</b>

## Course Descriptions

### FOUNDATIONS OF MEDICINE

The six interdisciplinary units in the Foundations of Medicine portion of the curriculum use a multidisciplinary, systems-based approach to teach the normal structure and function of the body while introducing students to basic clinical skills and abnormal structure and function. The disciplines (i.e., gross anatomy, biochemistry, etc.) are integrated and organized into units based either on foundational concepts (Units 1–3) or on organ systems (Units 4–6).

Each unit incorporates multiple teaching modalities including lectures, case-based learning, problem-oriented patient sessions (POPS), laboratories, and patient-skill laboratories. Students begin to spend half days in physician’s offices during Unit 2 and continue to do so throughout the year. Students are expected to take responsibility for ensuring that they obtain a conceptual understanding of subject matter as well as knowledge of factual information. Weekly formative assessments, similar to those used at the end of unit summative assessments, will help students track their progress.

### UNIT 1. SYSTEMS OVERVIEW: HUMAN STRUCTURE AND FUNCTION

Unit 1 begins with an overview of major organ systems that allows students to begin learning and practicing clinical skills, such as listening to heart and lung sounds, palpating major organs, and measuring pulse and respiration rates. Students begin to learn the structure of the human body by examining dissections and then performing dissections intended to demonstrate the musculoskeletal systems and consequences of injury to these systems. This learning will be supplemented by the use of medical imaging, such as radiographs and ultrasound. Students will also gain a grounding in concepts such as homeostasis.

This unit also includes: introduction to the doctor-patient relationship, the biopsychosocial model, and patient-centered communications skills; the seven dimensions of a symptoms as part of the history of present illness; learning the physical exam and its correlation to anatomy; and introduction to evidence-based medicine.

## **UNIT 2. MOLECULES TO CELLS**

In Unit 2 students develop an understanding of the biochemical, molecular, cellular, and genetic basis for disease. Progressing from a visual understanding of the musculoskeletal system, they explore cell and tissue structure and function based on diseases with both genetic and environmental origins. Among topics to be covered are the expression of genetic information, differences in structure and function of differentiated cells, protein and enzyme structure and function, energy generation by metabolism of basic foodstuffs and the role of nutrition in health and disease, early embryonic development, the cellular basis of neoplasia, and the life cycle and function of red blood cells. Students will continue to practice and develop clinical skills related to the diseases under study.

This unit also includes: Taking a family history and a pedigree, medication history, empathy and building a doctor-patient relationship, introduction to medical ethics, biostatistics probability, fundamentals of measurement, introduction to study design, principles of screening, public health, and human development with a focus on newborns and toddlers. Students begin to spend half days in doctors' offices.

## **UNIT 3. INFECTION AND HOST DEFENSE**

Unit 3 introduces students to infectious diseases, the biology of the causative agents and the defense systems that protect against them, both as defenders of the human body and as causes of disease when regulatory systems fail. Students extend their knowledge of blood cells by studying white blood cells and their role in defense against pathogens. They study the role of lymphocytes and antigen-presenting cells in humoral and cell-mediated immune responses, and the body-wide distribution of lymphoid tissues and organs. Principles of neoplasia learned in Unit 2 will be extended by studying cancers of the lymphoid system (leukemias and lymphomas) and their treatment. To understand the anatomical distribution of defense mechanisms and the sensitivity of respiratory passages to infectious agents, students will explore the anatomy of the head and neck and the susceptibility of these structures to infections by respiratory viruses. Diseases caused by disorders

of the immune system, such as allergies, inflammation, HIV infection, and auto-immunity will be examined. The role the immune system plays in diseases of skin, muscles, bones, and joints will also be a focus of this unit.

This unit also includes: Taking a sexual history, making a problem list and summary, introduction to clinical reasoning, the hypothesis-driven physical exam, study design, patient safety, public health, human development with a focus on pre-school and school-age children. Students continue their experiences in the doctors' offices

## **UNIT 4. GASTROINTESTINAL, ENDOCRINE, AND REPRODUCTIVE SYSTEMS**

Unit 4 is the first of three units focused on defined organ systems. Fundamental knowledge acquired in Units 1 to 3 will be applied to disorders and diseases that affect the gastrointestinal system, endocrine, and reproductive systems. Initially, students explore the structure and physiology of the gastrointestinal. Imaging techniques will help students relate the anatomy of the organs to their microscopic structure and the mechanisms underlying functionality. Interrelationships between organs (e.g., bowel and liver) will be explored to understand digestion and uptake of nutrients and the role of nutrition in normal health or disease. The study of the endocrine system naturally follows learning about the gastrointestinal tract as students learn about diabetes, the thyroid, and other hormonal systems. Finally, students will examine the structure and function of male and female reproductive systems and the control mechanisms that regulate their functioning. In an integrated fashion, students will become familiar with diseases and disorders that affect these systems, including breast and uterine cancer and dysfunctions of the endocrine systems that regulate such organs.

This unit also includes: Explaining and planning with patients; health literacy; review of systems and relevant physical exam for endocrine, gastrointestinal, and reproductive systems; study design; statistical measurement; medical ethics, and Journal Club. Students continue experience in doctors' offices.

## **UNIT 5. CARDIOVASCULAR, RENAL, RESPIRATORY SYSTEMS**

After the summer, Unit 5 begins the second year of Foundations. Students will learn about the structure and function of the cardiovascular system and the diseases that can affect it. Later, students will explore the functioning of the lungs and kidneys and their roles in maintaining homeostasis, as well as the consequences and treatment of diseases affecting these organs. Students will learn how these organs act together to regulate normal conditions within the body and what happens when this normal state is disrupted. Throughout the unit, students will apply their clinical skills and incorporate new information related to examination of the patient, including EKG data interpretation and imaging techniques. Students will continue to practice and develop clinical skills related to the diseases under study and begin to practice taking a medical history and performing a physical exam in the hospital setting.

This unit also includes: Geriatric interview; behavior modification and motivational interviewing; focused history and physical exam relevant to cardiac, respiratory, and renal diseases; problem lists including bio-psycho-social needs; preventive and therapeutic plan of care; post-encounter notes; evaluating commercial pharmaceutical and diagnostic literature; fundamentals of study design; and oral presentations. Students go to inpatient settings to practice taking medical histories, performing physical exams, and preparing a differential diagnosis and an initial diagnostic and treatment plan for a hospitalized patient.

## **UNIT 6. BRAIN, MIND AND BEHAVIOR**

Unit 6 is the last component of the Foundations of Medicine and is focused on understanding the central nervous system and its disorders. Initially, students will examine the gross and microscopic structures of the various regions of the human brain using dissections, imaging, and virtual microscopy. These studies will be combined with recognizing the effects of tumors and infections on the brain. Students will then apply concepts of central neural pathways to the neurological aspect of the physical examination and the effect of disorders, such as epilepsy, stroke, and demyelinating dis-

eases. Finally, students will explore how the brain determines aspects of human behavior and consciousness and the consequences of defects that lead to abnormal function and behavior (e.g., dementia, delirium, psychosis, and anxiety or depression). Students will continue to practice and develop clinical skills related to the diseases under study.

This unit also includes: Patient-centered interviewing with the difficult patient, delivering bad news, palliative care and death and dying, focused history and physical exam relevant to neurology and psychiatric diseases, write-ups including assessment and plan, evaluating therapeutic literature, search strategies, oral presentations, shared decision making, and diagnostic strategies. Students go to inpatient settings to take medical histories, perform physical exams, and prepare a differential diagnosis and an initial diagnostic and treatment plan for a hospitalized patient.

Following the assessment week for Unit 6, students will have an interval to study for and pass the Step 1, United States Medical Licensing Exam (USMLE), one of the three exams required for licensure and also required for promotion to our next level of Core Clinical Medicine.

### CORE CLINICAL MEDICINE (CLERKSHIPS) — 12 MONTHS

Clerkships are paired during the Core Clinical Medicine year to support integration of relevant basic science knowledge.

Transition to Clerkships	1 week (precedes clerkships)
Women's Health	6 weeks
Pediatrics	6 weeks
Psychiatry	6 weeks
Neurology	4 weeks
Career Exposure Elective	2 weeks
Internal Medicine	8 weeks
Primary Care Block	4 weeks
Perioperative Care, Anesthesia, & Surgery	10 weeks
Career Exposure Elective	2 weeks
Longitudinal Primary Care Rotation	½ day over 24 weeks of Medicine and Surgery Clerkships

Clerkships are paired during the Core Clinical Medicine year to support integration of relevant basic science knowledge.

### Transition to Clerkships—1 week

This mini-course provides an overview of skills, knowledge and attitudes required for clinical clerkships. Through lecture and small group exercises, students learn about the continuum of care of patients from hospital admission through discharge and follow-up, the medical student's role in patient care, the learning habits and attitudes required to succeed in clinical settings, and methods of assessment and evaluation used in the clinical years. Precedes clerkships.

1 credit

### Women's Health—6 weeks

A wide variety of clinical experiences provide learning opportunities in the area of women's health from menarche to menopause and beyond. Students gain experience in procedures such as collecting and interpreting a cervical cytology, participating in delivery and postpartum care, and counseling patients on health issues such as contraception, pregnancy, and breastfeeding. Both outpatient and inpatient experiences are used.

6 credits

### Pediatrics—6 weeks

The pediatric clerkship is designed to provide students with the basic knowledge and skills necessary to evaluate and manage patients from birth through adolescence. Students are expected to acquire an understanding of history-taking skills (including interviewing parents), basic procedures, and physical diagnosis techniques as they apply to pediatric patients of various ages. Students spend four weeks in an in-patient setting and two weeks in a combined nursery/ambulatory setting.

6 credits

### Psychiatry—6 weeks

Students work on in-patient psychiatric units in evaluation, treatment, and management of patients under supervision. In-patient work is supplemented with selected outpatient clinical experiences and a program of formal didactic instruction.

6 credits

### Neurology—4 weeks

This clerkship provides experience in the physical examination, diagnosis, and management of patients with neurological diseases. Students are assigned patients for whom they assume responsibility under the supervision of resident and attending neurologists. Students participate in weekly clinical conferences and outpatient clinics, and are introduced to the use of neurological tests, such as EEG, EMG, CT scans, MRI scanning, cerebral angiography, and myelography.

4 credits

### Career Exposure Elective—2 weeks

Students are required to complete one 2-week Core Year elective during the Core Clinical year (MS3). These Selectives are designed to give students an opportunity to see and participate in fields of Medicine that they may not be exposed to at all during clerkships, e.g. ophthalmology, neurosurgery, radiation oncology. There are other fields like radiology where they may have some exposure during clerkships but may still not get a good understanding of what the field is like as a career choice. During the Selectives students should have a chance to see what the field is like and to think about whether their interests and personality are suited to it. The course objectives are mainly designed to help analyze the essential features of the specialty.

A typical example of course objectives (for nephrology) is as follows:

- Describe the range of clinical conditions diagnosed and treated in nephrology
- List typical patient presentations encountered
- Name two indications for a generalist to refer a patient to a nephrologist
- Describe the major procedures performed by nephrologists
- Take an appropriately focused history
- Perform an appropriately focused physical exam
- Discuss the diagnostic approach to a common patient presentation in nephrology
- Discuss the management of a common disease in nephrology
- Describe specific communication skills nephrologists must develop
- List the other members of a typical health care team in nephrology

- Discuss an ethical issue specific to the field of nephrology
- Identify environmental, social, or behavioral determinants of kidney diseases
- Explain the relevance of preventive measures in nephrology
- Describe the training path required to practice nephrology and its subspecialties
- Name two major nephrology journals and the types of papers they publish
- Identify an active area of research in nephrology

2 credits.

### **Internal Medicine Clerkship—8 weeks**

Students are introduced to clinical medicine; develop skills and knowledge needed to evaluate patients; learn the principles underlying therapy; and develop an appreciation of their role as a member of a health-care team, a sense of responsibility for the well-being of their patients, and an understanding of the effort and dedication required of a caregiver.

8 credits

### **Primary Care Block—4 weeks**

(Select either PRIM 3801 or FAMP 3802. Both PRIM 3801 and FAMP 3802 have a continuity component that extends one afternoon per week for 24 weeks. This continuity experience can be a clinical placement, an individual distance-learning assignment, or a community outreach experience.)

#### **PRIM 3801**

Students spend four consecutive weeks in a functioning clinical ambulatory care setting in medicine, medicine/pediatrics, pediatrics, or family medicine. Students expand existing skills in medical interviewing, and physical diagnosis while developing additional skills in differential diagnosis, health maintenance, patient counseling, and follow-up. In addition to direct patient-care responsibility, small group case discussions and topic reviews of particular importance to primary care form the core of the teaching. Students present an in-depth review of one primary-care topic during the course, and in addition may elect to do a special project in ambulatory or community health to receive an Honors grade. Students spend one afternoon a week

at the SUNY Downstate campus taking Essentials of Clinical Medicine III, which reemphasizes and extends skills and knowledge acquired in the first two years of the ECM sequence.

#### **OR, FAMP 3802**

Students spend four consecutive weeks participating in a variety of activities designed to expose them to the challenge of providing care to non-hospitalized patients. The main goal of this experience is to develop basic clinical and procedural skills for common presenting problems in each of six core areas: Adult Health, Child Health, Women's Health, Geriatrics, Behavioral Medicine, and Preventive Medicine and Well Care. Students work one-to-one with physicians, physician assistants, and resident physicians in the role of primary "student" physicians in an office-based setting in the care of children, families, and adults with a range of acute and chronic problems. Students also spend one afternoon a week at the SUNY Downstate campus taking Essentials of Clinical Medicine III, which reemphasizes and extends skills and knowledge acquired in the first two years of the ECM sequence.

4 credits in either course.

### **Perioperative Care, Anesthesia, & Surgery—10 weeks (2 weeks Perioperative Care/Anesthesia, and 8 weeks Surgery)**

#### **Perioperative Care/Anesthesia Component:**

The anesthetized patient provides an excellent model for students to learn how to recognize and treat individuals whose respiratory, cardiovascular, and central nervous system have been electively depressed. Students are able to apply basic-science principles to understand the pathophysiology of the patient with CNS, cardiovascular, and respiratory depression. Students become knowledgeable about the risks and hazards of anesthesia and the problems unique to the specialty. Students are expected to take an active part in the perioperative care of patients presenting for surgery and anesthesia. In addition to participating in clinical care, students attend rounds, conferences, and lectures.

#### **Surgery Component:**

The student follows patients on a variety of surgical services throughout their illnesses and takes an active part in the therapy, including the performance of minor

technical procedures, assisting at operations, and following results. Emphasis is placed on the clinical, rather than the technical, aspect of surgery. Instructional venues include rounds, teaching conferences, and an audiovisual laboratory in addition to clinical teaching at the bedside. 8 weeks.

10 credits for both components.

### **Longitudinal Primary Care Rotation**

This component consists of one-half day over 24 weeks of Medicine and Surgery Clerkships.

### **ADVANCED CLINICAL MEDICINE — 14 MONTHS**

Advanced Clinical Medicine year requires students to take the following:

Sub-Internship in Medicine or Pediatrics	4 weeks
Diagnostic Imaging Rotation	4 weeks
Translational Science Selectives (two, 2 week selectives)	4 weeks
Critical Care Rotation	2 weeks
Geriatrics and Palliative Care	4 weeks
Emergency Medicine Rotation	4 weeks

Students will have 4 additional months of elective time and 4 months for vacation, Step 2 studying, and residency interviews.

### **Sub-Internship in Medicine or Pediatrics – 4 weeks**

The goals of the subinternships are to: (1) assist the student in the recall, synthesis and application of knowledge at the bedside, (2) gain experience in the delivery of medical care and develop clinical judgment, and (3) emphasize the importance of professional behavior and humanistic attributes in daily patient care.

#### **Internal Medicine Subinternship:**

The sub-intern functions as an integral part of the medical delivery team which includes senior and junior medical residents, as well as 3rd year students. The sub-intern assumes the primary care responsibility for approximately six patients from the time of admission until discharge. They are responsible for the initial evaluation and daily care of patients including admitting and follow-up orders (which must be counter-signed), daily progress notes and diagnostic/therapeutic procedures.



Or,  
**Pediatrics Subinternship:**

As a subintern, the student will assume the role of an intern on the pediatric inpatient service at either UHB or KCHC or SIUH. The student will have all the responsibilities of an intern in providing direct patient care under the supervision of senior residents and attending faculty and serve as part of the inpatient team. The student will participate fully in daily morning work rounds, daily attending rounds, sign-out rounds and all departmental conferences. Goals: To learn the principles of managing hospitalized children and to learn common disorders of children requiring hospitalization.

**Course Learning Objectives:**

1. Admit and work up new patients.
2. Follow and take responsibility for hospitalized patients.
3. Participate and observe during attending rounds.
4. Learn to take individual responsibility working as part of the ward team.

**Student's Performance Assessment Methods:**

Direct observation by a) Attending Physician, b) Senior Resident.

*4 credits.*

**Diagnostic Imaging Rotation – 4 weeks (effective April 2016)**

Highly structured, full-time, one-month course for 3rd and 4th year medicine students at SUNY Downstate Medical Center. Self-instruction online interactive clinical scenarios and tutorials in hospital Radiology Department, radiology rotating exhibits, round table discussions, seminars, film reading sessions, all clinically orientated. No international visiting medical students are accepted. U.S. visiting medical students are accepted.

**Learning Objectives:**

1. Explain the physical basis and imaging principles for the five major modalities employed in diagnostic radiology: radiography, computerized tomography (CT), magnetic resonance imaging (MRI), ultrasound (US) and nuclear medicine.
2. Interpret patient studies of the five imaging modalities mentioned above, evaluating whether each study is normal or abnormal.
3. For studies deemed abnormal, compose a reasonable differential diagnosis based on student's appraisal of the pattern of

abnormality and integration of the clinical information provided.

4. Formulate an appropriate diagnostic imaging work-up to confirm or rule out a variety of diseases and abnormal conditions.

**Methods used to assess student's performance:**

Observation, case presentations by individual students, student participation in round-table discussions, written mid-term exam, written final exam, practical final exam.

*4 credits.*

**Translational Science Selectives—4 weeks (two 2-week selectives)**

Four weeks of the advanced clinical year are devoted to an intensive focus on basic or translational science. These Basic and Translational Science Selectives (B sels and T sels) are focused on either (1) mechanisms of disease, (2) specific areas of translational research, or (3) research methodology, interpretation of data, or critical appraisal of literature. B sels and T sels are designed to ensure that students reach their fourth and final benchmark, and thus achieve Downstate's curricular goals, in the domains of medical knowledge and practice-based learning and improvement. These selectives also prepare students to perform at a high level in their chosen residency, since trainees are expected, from the beginning of internship, to understand the science underlying their clinical work and to read, analyze, and appraise the scientific and medical literature pertinent to their disciplines.

*4 credits.*

**Critical Care Rotation – 2 weeks**

The critical care experience may be taken in a variety of units so there will be differences in patient population and prevalent conditions that will result in different teaching topics and recommended reading. The basic topics students should gain familiarity with regardless of unit are these:

- Respiratory failure and mechanical ventilation
- Acute Respiratory Distress Syndrome
- Sepsis/SIRS
- Hypotension/shock
- Coma

Required reading is from Harrison's *Principles of Internal Medicine* (available electronically in the library), chapters 267 – 271 and 274.

*2 credits.*

**Geriatrics/Palliative Care— 4 weeks**

The curriculum ensures a foundation in attitudes, knowledge and skills required for competent and compassionate care of older patients. It is focused on acquiring proficiencies in the attitudes, knowledge, and skills needed for elder care. Knowledge and experience are gained of the common geriatric syndromes, including altered mental status, iatrogenesis, mobility including falls, sensory deficits, failure to thrive, sleep disorders, pressure ulcers, incontinence, and nonspecific presentation of disease. Risk-reduction and preventive care are emphasized. The Clerkship includes a lecture series on Palliative Care with emphasis on the EPEC, a site visit to Calvary Hospital, and direct clinical experiences at the individual sites. A palliative care website is available for student participation and will be an additional requirement for completion of this segment.

*4 credits*

**Emergency Medicine Rotation— 4 weeks (effective April 2016)**

Students will evaluate patients as they initially present with a variety of acute illnesses and injuries. A major goal of the clerkship is that students learn the importance of establishing priorities in the care of acutely ill patients. Particular emphasis is placed on assessing and stabilizing respiratory, circulatory and basic metabolic functions. In addition, students will be

exposed to the unique medical needs of an inner city population, including primary and preventive care. During their clinical shifts, students will develop and refine their skills in the following areas:

1. Acquiring a chief complaint driven history, physical examination and forming differential diagnosis.
2. Appropriate use and analysis of laboratory and radiological data,
3. Performing some basic emergency procedures under close supervision.
4. Rapidly establish an alliance with patients and their families as they cope with the emotional trauma of emergencies, critical illness, and death.

*At the end of the clerkship students are expected to achieve the following:*

1. Understand the role an emergency department (ED) plays in the healthcare system regardless of your chosen medical specialty.
2. Understand the nature of the ED in terms of appropriate patient management and flow; its impact on patient expectations and societal needs; its collaborative nature with other medical specialties.
3. Develop focused chief-complaint driven history taking and physical exam skills.
4. Develop clinical reasoning skills including appropriate differential diagnosis and management plans.
5. Recognize critical and potentially life-threatening medical conditions and know the initial interventions needed to stabilize the patient.

*Grading is based on the following criteria:*

1. Mandatory attendance to all assigned clinical shifts. There are sixteen (16) 8-hour shifts (days/ evenings/ overnights) rotating through various areas of the ED.
  2. Mandatory attendance to all scheduled educational activities.
  3. Clinical Performance (participation, professionalism and development of clinical competence, self-directed learning).
  4. One complete case presentation and write-up.
  5. Final written exam (NBME or equivalent).
  6. Oral exam -- OSCE format.
  7. Completion of course-log requirements.
- 4 credits.*

## MD/PhD Program

The College of Medicine and the School of Graduate Studies jointly sponsor a program leading to a combined MD/PhD degree. This program combines a medical education with an intensive research experience, and is designed for students who are interested in pursuing a career in academic medicine. Students are supported with a stipend and a tuition scholarship throughout the duration of the program.

## MD/MPH Program

Medical students at SUNY Downstate can earn a master's degree from the School of Public Health at the same time as earning their MD degree. The MPH program focuses on the health of immigrant and urban populations. Students may choose to complete the MPH degree in one of five core areas:

- Biostatistics
- Community Health Sciences
- Environmental and Occupational Health Sciences
- Epidemiology
- Health Policy and Management

MD/MPH students are given preference for selection in the overseas elective for medical students: Healthcare in Developing Countries.

## Research Opportunities

Medical students are encouraged to participate in basic and/or clinical research starting as early as their first year. Significant basic science and clinical faculty support is provided to those students interested in specific research training and experience in order to connect/match them to the appropriate research mentor.

The range of opportunities for students includes:

- 1) summer research projects, usually after the first year of medical school;
- 2) a "year-out" program to perform a full year of research; and
- 3) the MD/PhD program

Students conducting summer research projects are encouraged to apply for national fellowships or for campus fellowships funded by the Alumni Association and the College of Medicine. Top student research is acknowledged/rewarded at Downstate through annual competitive awards sponsored by the Robert F. Furchgott Society and the Alumni Association. Students conducting significant research through the summer or "year out" programs are eligible for special recognition at graduation, when the dean of medicine grants Distinction in Research and Commendation in Investigative Scholarship awards.

Annual Research Day is a significant event on campus. Student research is acknowledged in a global poster session.

# Clinical Training Facilities

Medical students receive their clinical training at University Hospital of Brooklyn; Kings County Hospital Center (located directly across Clarkson Avenue); and at affiliated institutions and sites throughout the metropolitan area. Current information is posted on the institutional website ([www.downstate.edu](http://www.downstate.edu)).

## **UNIVERSITY HOSPITAL OF BROOKLYN**

University Hospital of Brooklyn is the teaching hospital of SUNY Downstate Medical Center. Fully accredited in all medical subspecialties, it provides primary and advanced medical care to more than 300,000 patients annually.

UHB's main facility is located on campus, with 376 beds, 8 intensive care and step-down units, 12 operating rooms, an adult and pediatric ER, a diagnostic and ambulatory surgery facility, a transplant center, and 75 outpatient clinics. Its Children's Hospital offers specialized pediatric services. UHB is a designated Regional Perinatal Center.

UHB also has two community-based centers in East New York and Midwood; a Dialysis Center; and an Urgent-Care Center and Ambulatory Surgery Center in Bay Ridge.

University Hospital's integration with the College of Medicine has made it possible to assemble a full-time staff of

clinicians, basic scientists, and other health-care professionals who have strong academic backgrounds in their fields of specialization. The staff is enriched by a part-time faculty of voluntary attending physicians from the community who devote time to Downstate. Faculty members closely supervise the care of patients while instructing medical students and other future health professionals.

## **KINGS COUNTY HOSPITAL CENTER**

One of the largest acute-care hospitals in the country and the largest municipal hospital in New York City, with 43 acres and 23 buildings, Kings County Hospital Center offers clinical opportunities of every description. It is operated by the Health and Hospitals Corporation of the City of New York. Kings County's facilities include one of the country's busiest emergency rooms, a nationally recognized Level I trauma center, and more than one hundred ambulatory care services. Kings County averages 23,000 admissions, 140,000 emergency room visits, and more than 543,000 outpatient visits annually.

## **CLINICAL AFFILIATES**

Complementing the clinical experiences available at University Hospital of Brooklyn and Kings County Hospital are a wide variety of hospitals and clinical settings throughout the metropolitan area. The list of clinical sites used in the teaching program may vary from year to year and is updated annually in the *Course Selection Book* and other university information

sources.

*Affiliated clinical sites have included:*

Bedford Stuyvesant Family Health Center  
Brookdale Hospital Medical Center  
Brooklyn Hospital Center  
Coney Island Hospital  
Cumberland Diagnostic and Treatment Center  
Downstate Mental Health Associates  
East New York Diagnostic & Treatment Center  
Flushing Hospital Medical Center  
Interfaith Medical Center  
Kingsboro Psychiatric Hospital  
Kingsbrook Jewish Medical Center  
Lutheran Medical Center  
North Shore-LIJ Health System, including Lenox Hill Hospital  
Parker Jewish Institute for Health Care and Rehab  
Richmond University Medical Center, Staten Island  
Sephardic Home for the Aged  
St. John's Episcopal Hospital  
South Nassau Communities Hospital  
Staten Island University Hospital  
Susan Smith McKinney Nursing Home  
VA New York Harbor Healthcare System - Brooklyn Campus  
Woodhull Medical and Mental Health Center

# Support Services for Students

## **ACADEMIC ADVISEMENT**

During the first two years of medical school, students are encouraged to seek academic assistance from their course directors or faculty instructors regarding how to improve their academic performance in a particular course. Students in academic difficulty should also seek early assistance from the Office of Academic Development and the director of student counseling (for anxiety reduction and relaxation techniques).

Students who have questions regarding academic policies or their academic status, or seek information regarding academic support services, may seek assistance from the deans in the Office of Student Affairs.

During the clinical years, students in academic difficulty in a particular course are encouraged to seek assistance from their clerkship course director or faculty preceptors/attendings, the Office of Academic Development, and the director of student counseling. Students who have questions regarding academic policies or their academic status in the clinical years, or who seek information regarding academic support services, may seek assistance from their clinical assistant dean or from the deans in the Office of Student Affairs.

## **OFFICE OF ACADEMIC DEVELOPMENT**

The mission of the Office of Academic Development is to enhance students' academic performances. During each year of study and training, medical students are confronted by a range of new challenges. For example, incoming students must rapidly adapt to exacting time constraints, a challenging level of detail in the knowledge required for passing, and to the vast volume of information presented during each course.

Even outstanding students may find it daunting and difficult to adapt to the new study and learning environment.

To make medical studies less stressful and more enjoyable, the Office of Academic Development offers a variety of services. These include group and individual tutorials; review sessions and workshops; and support for licensing exam preparation. The director and assistant director also provide individual academic advising and counseling for all students in the following areas:

- Study strategies
- Test taking
- Time management
- Resource management
- Memory and retention

For current contact information, consult the *Student Handbook*.

## **OFFICE OF MINORITY AFFAIRS**

The Office of Minority Affairs directs several programs specifically targeted to furnish needed information and support for students who are underrepresented in medicine—African Americans, Native Americans, Mexican Americans, and Hispanics. One such program, Operation Success, is a six-week summer program designed to provide a sampling of course content scheduled for the first academic semester. A skills-development component helps to improve basic study and time-management skills. The program also offers students the chance to meet and develop relationships with faculty and classmates, helping them feel comfortable in the new environment.

The office also administers several programs that encourage and assist students to enter medicine, allied health, or basic science. An undergraduate Summer Research Fellowship is available in either the basic sciences or clinical specialties. The PATH program works with students from several local colleges to prepare them to enter the healthcare professions.

The Office of Minority Affairs provides support to two student organizations: the Daniel Hale Williams Society, Downstate's chapter of the Student National Medical Association (SNMA), is named for an African American physician who was the first to perform surgery on the heart and have the patient survive. Its goals are educational, social, and service-oriented. SALUD, Downstate's chapter of the National Boricua Latino Health Organization (NBLHO), promotes health awareness and provides information relating to illnesses that primarily affect the Latino community.

## **RESIDENCY INFORMATION AND ADVISEMENT**

Information about residency advisement resources is available on the institutional website. These resources are supplemented through class meetings and programs throughout the four years.

Careers in Medicine is an on-line program: [www.aamc.org/careersinmedicine](http://www.aamc.org/careersinmedicine). It is designed to assist medical students in understanding options for choosing a specialty and applying to residency programs.

A shadowing program is available through the College of Medicine Alumni Association; career exposure opportunities and noncredit electives are also available. Specialty oriented student organizations provide additional information and exposure to the specialties.

The Alpha Omega Alpha (AOA) Medical Honor Society organizes a Subspecialty Forum in the spring. Faculty representatives from the academic departments come and talk to first- and second-year students about their field of medicine. During Transition to Clerkships, faculty panelists describe their careers.

A list of Specialty Advisors is distributed to students annually. This is a list of individuals designated by each department who are prepared to offer specialty counseling and advisement to students.

### **Residency Information Resources**

The Student Affairs website has a section titled “Residency Application Guidance” that has helpful resources for students.

### **STUDENT COUNSELING**

The Student Counseling Service is part of the Student Health Service and provides counseling and psychological services to matriculated students in the Colleges of Medicine, Nursing, Health Related Professions, School of Graduate Studies and School of Public Health. All information revealed to the counselor is strictly confidential and cannot be shared with another person without the student’s consent. It is staffed by a licensed clinical psychologist who has extensive academic and professional experience in the field of academic counseling.

The Student Counseling Service has been established to help students deal with academically related stress as well as with any other personal problem that can interfere with their performance in school. These problems can include anxiety and fear, depression, low self-esteem, interpersonal difficulties, family problems, and habit-control problems (e.g., overeating, alcoholism, and drug abuse). Additional information regarding programs and services is detailed in the *Student Handbook*.

### **STUDENT HEALTH**

The Student Health Service provides primary care for acute conditions, illnesses, and injuries to the more than 1,700 full-time and part-time matriculated students at SUNY Downstate. It also provides routine health clearances, immunizations, and tuberculin testing when needed. Services are not available to students who have not paid the Student Health fee, students on leave of absence, or families of matriculated students. Student Health includes, at no extra charge, a student counseling service for all matriculated students.

All students must submit a completed health form that includes, among other things, documentation of a tuberculin test (or chest x-ray if tuberculin is positive) and immunity to measles, mumps, rubella, varicella, and hepatitis B. Students not complying with this requirement will not be permitted to register for classes.

### **Purpose and Functions**

The Student Health Service makes available to matriculated students preventive, therapeutic, and consultative medical care. The coverage provided by Student Health does not include hospitalization, laboratory fees, radiology fees, psychiatric care (other than initial evaluation and counseling by an on-campus psychologist), dental care, or consultation with physicians other than Downstate physicians. Students in the School of Graduate Studies who are covered by the SUNY Graduate Student Employee Health plan use Student Health for primary care and referral to network physicians.

SUNY Downstate and its affiliated hospitals have protocols for exposure to blood and body fluids. This is detailed in the Student Health information pamphlet and in the *Student Handbook*.

Additional information regarding programs, hours, services, and policies is available in a brochure published by the Student Health Service and also in the *Student Handbook* as well as on the institutional website ([www.downstate.edu](http://www.downstate.edu)).

### **Student Health Advisory Committee**

The Student Health Advisory Committee includes members of the faculty, the director of the Student Counseling Service, the director of the Student Health Service, administrators, and students. The role of the Committee includes making recommendations regarding health services, counseling, health insurance, utilization of the yearly student health fee, and any other student health issues. The committee serves as an advisory body. Students with questions or suggestions are encouraged to speak to the director of the Student Health Service or the Office of Student Affairs.

### **Student Health Insurance**

Student health insurance is mandatory for all students. Information about the health-insurance plan currently available may be obtained from the Office of Student Affairs.

# Other Campus Organizations

## **ALUMNI ASSOCIATION— COLLEGE OF MEDICINE**

Every medical student and graduate of the College of Medicine is a member of the Alumni Association. Annual dues finance alumni office costs and alumni publications and provide for record maintenance, archives, and services to alumni and students.

The charitable mission of the Alumni Association is accomplished through the Alumni Fund and administered by the Board of Trustees. Contributions to the Alumni Fund support a variety of programs for medical students, including scholarships, research fellowships and scholarly pursuits, travel stipends for electives abroad, the White Coat Ceremony, and many other student activities.

## **MENTORING PROGRAM**

The Mentoring Program is sponsored jointly by the Alumni Association and the Dean's Office. Its purpose is to provide personal attention and advisement to first-year students and to create an environment that eases their adjustment to medical school. First-year students are matched to clinical faculty on the basis of their specialty interests, and to second-year student co-mentors. Mentors strive to establish supportive relationships with their students by engaging them in social, clinical, and research activities that satisfy their needs and offer a perspective on medicine as a career.

## **PARENTS ASSOCIATION**

### *Purpose*

- To introduce parents to the College of Medicine and help them become acquainted with it.
- To acquaint parents with the College's academic program through guest speakers from the College (faculty and administration) and to learn about various medical specialties.
- To assist parents in learning how to cope with the emotional needs of medical students.

### *History*

The parents of the students at the Long Island College of Medicine began working as a group in 1943. They assisted in a fundraising campaign to expand the College's physical plant and to help meet its annual deficit. In 1947, the group was formally organized as the Parents' Society of the Long Island College of Medicine by adopting a constitution and bylaws. The Parents Association is committed to having a "better understanding among parents, professional staff, students, the school, and the community."

### *Membership*

Meetings are held on the third Thursday of each month. These membership meetings provide an opportunity for parents to meet each other and share students' common concerns and problems.

# School of Graduate Studies

## **PhD MD/PhD**

Graduate Study

Admissions

Programs of Study

Courses of Instruction

Joint Doctoral Program in  
Biomedical Engineering

## **Graduate Study**

Founded in 1966, the School of Graduate Studies is one of five colleges that make up the State University of New York Downstate Medical Center, and is accredited by the Middle States Association of Colleges and Commission on Higher Education. The School of Graduate Studies offers three PhD degree-granting programs: Molecular and Cellular Biology, Neural and Behavioral Science, and a joint PhD program in Biomedical Engineering in collaboration with the Polytechnic Institute of New York University. Students are reviewed by program-specific admissions committees, which rank students for the admissions process. Students are admitted into one of the three PhD programs, but they are permitted to change their affiliation up until the end of their first year (special circumstances may necessitate a program change at a later time).

The interdepartmental organization of Downstate's graduate programs reflects the interdisciplinary nature of modern biomedical research. Neural and Behavioral Science research ranges from molecular and cellular neurobiology to systems and behavioral neuroscience and computational neuroscience. Downstate's neuroscientists study single cells, in vitro brain and nerve preparations, intact animal models, and human subjects. Specific areas of research strength include the molecular mechanisms of learning and memory; the neuronal circuits and synchronous brain activity patterns underlying spatial navigation; the cellular, synaptic, network, and molecular mechanisms of seizure activity and epilepsy, Alzheimer's disease, brain injury, and stroke; the cellular and molecular basis of pain and addiction, the neurodevelopmental consequences of drug exposure, and brain activity biomarkers for

alcoholism; imaging of brain activity; gender differences in neurotransmitter receptors and neuronal circuit properties; and neuroimmunology.

The breadth of Molecular and Cellular Biology is even greater. Strengths include genetic regulation of the development of the cardiovascular system; lipid metabolism and its role in atherosclerosis; the genetic and molecular basis for diseases such as skin cancer, pancreatic cancer, and myeloma; the regulation of transcription and translation in eukaryotic systems; the roles of RNA and proteins regulating RNA in various cells, including tumor cells and neurons; and the fundamental control of the cell cycle. There is substantial research on immunology that focuses on cells important for host defense against infections and tumors, evolution, and the generation of antibody diversity; regulation of B-cell differentiation related to immunodeficiency and cancer using a transgenic mouse model, and a novel tissue culture system. In fact, examples of research areas that cross the boundaries of the programs include our very active opioid research program, in which investigators study dependence, tolerance, and sex-steroid regulation of opioid pathways and of pain, and studies of anxiety induced during estrous-cycle progesterone withdrawal.

Given its emphasis on applied research, the Biomedical Engineering Program is home to many clinically relevant research projects. This includes cutting-edge research aimed to elucidate the cellular and molecular mechanisms of stroke and epilepsy, neuroengineering methods and neurorobotics to control sensory and motor neuroprosthetic devices, and novel optical-tomography imaging systems that use light at near-infrared wavelengths to image pathophysiological tissue specimens of brain and breast.

A fourth option, available only as an MD/PhD option, is a joint program focused on nanomedicine with the College of Nanoscale Science and Engineering, a division of the University at Albany. In this program, students perform their MD studies at Downstate and their PhD studies at the College of Nanoscale Science and Engineering. With the development of nanotechnology for diagnostic and therapeutic options, this degree option is intended to train physicians who will be the first to deploy a broad range of technologies in the clinics. The PhD in Nanoscale Science or Nanoscale Engineering will be broadly useful as the variety of early stage applications expands, including cancer diagnostics and treatment, artificial cellular environments to support tissue repair and stem cell applications, tools for imaging and detection of specific cell types, and specialized materials for implants useful in orthopedics and neuroscience.

The interdepartmental structure of Downstate's graduate programs fosters research collaborations and consolidates educational and scientific resources. An atmosphere conducive to scholarship and research is fostered, focusing on understanding the basic biological processes that underlie human health and disease. One of the chief objectives of the School of Graduate Studies is to educate those students who will become teachers and investigators in the biomedical sciences. Our campus and system-wide resources in technology development and entrepreneurship are leveraged for interested students. Students are introduced to biomedical scientists in non-academic careers, e.g., those working in biotech start-up companies in Downstate's Advanced Biotechnology Park.

### **MD/PhD PROGRAM**

The MD/PhD Program, which leads to the conferral of both MD and PhD degrees, is designed for students who intend to enter a career of research and teaching in academic medicine. In general, MD/PhD students are supported with both a stipend and a tuition scholarship throughout the medical and graduate school years.

Graduates of this program differ from most basic scientists in having had the extensive medical training required to investigate problems of disease. They also differ from most clinicians in having the detailed background, fundamental knowledge, and intensive research experience required for applying biomedical sciences techniques to clinical investigation.

The general aim of the program is to provide education in pre-clinical and clinical aspects of medicine equivalent to that obtained by regular medical students, along with intensive research experience in the basic medical sciences equivalent to that obtained by graduate students. Thus, students are expected to complete all requirements for an MD degree and a PhD degree, including a doctoral thesis. The entire program takes at least six years but usually more.

During the program's first two years, students are enrolled in the standard curriculum of the College of Medicine. They are expected to work in research laboratories at the medical center during the summer months following completion of first- and second-year classes in the College of Medicine. The final choice of sponsoring graduate program may be deferred until the end of the second year. The supervision of a student's research program is the responsibility of the sponsoring PhD program.

After completing the first two basic science years in the College of Medicine, students pursue full-time graduate work. Following their thesis defense, they return to the third year of the College of Medicine. Credit for courses taken in the College of Medicine are transferable up to a maximum of 24 credits toward the PhD degree.

### **POSTDOCTORAL FELLOWS**

All basic science and clinical departments may sponsor postdoctoral fellows who are involved in basic science or clinical investigation. In general, several years of postdoctoral experience are required for those intending to pursue an academic career. The fellowship period provides an opportunity to obtain the breadth of experience required for a successful career in research and teaching.

More usually, postdoctoral fellows are sponsored by individual faculty members who agree to provide support and the requisite facilities. There are no formal regulations governing acceptance, duration of study, or allocation of support from Downstate's resources, although general guidance may be obtained from the Office of the Dean of the School of Graduate Studies. Fellows are notified of all Downstate events and are invited to participate in the three graduate programs' biweekly seminar series, special symposia, meetings, lectures, and conferences.



# Admissions

Current admissions information and policies appear on the institutional website: [www.downstate.edu](http://www.downstate.edu).

Applicants are selected on the basis of their qualifications, without regard to sex, age, race, creed, national origin, or handicap. The School of Graduate Studies strongly welcomes and encourages applicants from underrepresented minority groups. Decisions regarding admission are based on a number of factors including, but not limited to, research experience, academic records, results of standardized tests, letters of recommendation, and a personal interview. Qualities such as interest, intellectual curiosity, perceptivity, and ability to reason are strongly considered in addition to the academic record.

The School of Graduate Studies, as a unit of the State University of New York, gives preference for admission to residents of New York State. However, applications from out-of-state residents are very much encouraged. The school is also authorized under federal law to enroll non-immigrant foreign students with appropriate visas. Admission to the School of Graduate Studies is limited to students seeking the degree of PhD or MD/PhD for research in basic biological sciences and biomedical sciences.

Candidates are considered by a school-wide admissions committee and admitted mostly in September, but occasionally in January. Candidates for a doctoral degree are only admitted on a full-time residence basis. Members of the graduate faculty sponsor students in their own fields of expertise, and application to the School of Graduate Studies implies willingness on the part of the candidate to work on subject matter that is relevant to ongoing faculty research at Downstate.

## REQUIREMENTS FOR ADMISSION

### Graduate Students

Applicants should submit the following documents to the:  
Office of the School of Graduate Studies  
Box 41  
SUNY Downstate Medical Center,  
450 Clarkson Avenue  
Brooklyn, NY 11203-2098

1. Completed application for admission from the Graduate School website: [www.downstate.edu/grad](http://www.downstate.edu/grad)
2. Official transcripts of all undergraduate and graduate courses. Applicants are expected to have a bachelor's degree from an accredited institution.
3. Letters of recommendation from two or more persons familiar with the applicant's academic background and potential for research.
4. Results of the Graduate Record Examinations. Applicants to the MD/PhD Program may instead submit results of the Medical College Admission Test. Graduates of U.S. medical schools may submit results of the United States Medical Licensing Examination.

The completed application is reviewed by a school-wide admissions committee of multidisciplinary faculty. Before acceptance, an applicant is invited for a personal or telephone interview. Students are expected to specify a particular graduate program at the time of application, but may change their mind up until the end of their first year of study at the School of Graduate Studies—after they have completed at least one laboratory rotation. There is rolling admission; however, the absolute deadline for September matriculation is January 15. Stipends as well as tuition scholarships are available to graduate students.

### MD/PhD Program

Students in this program work toward a combined MD/PhD degree, and they are alternately enrolled as students in either

the College of Medicine or in the School of Graduate Studies. Applicants to this program must first apply for admission to the College of Medicine, and they are then considered for the combined MD/PhD program as part of the admissions procedure. Students who are already enrolled in the College of Medicine may apply for admission to the MD/PhD program at any time during their first two years of study. In evaluating applicants for the program, considerable emphasis is placed on prior research experience, such as that gained during summers or through appropriate electives, and on demonstrated potential for a research career. Applications should be submitted as early as possible during the preceding academic year, no later than the deadline date of December 15.

### Nonmatriculated Graduate Students

A graduate student enrolled at another institution may be admitted to take a course given by a particular program if acceptance is recommended by the program director and approved by the dean; the specific courses must be approved by the home institution. Postdoctoral fellows and research assistants at Downstate may also register as nonmatriculated students to take courses offered by the School of Graduate Studies upon recommendation by their faculty supervisor and approval by the dean. Credits earned as a nonmatriculated student are limited to 12.

### Transfer Credit

Transfer credit toward the doctorate will be granted for graduate level work at accredited institutions, in accordance with the regulations of the Commissioner of Education, Section 52.2(e)(3). Up to 24 credits may be transferred. Any advanced credit must be approved by the dean and must be in keeping with the candidate's academic objectives. Program requirements, however, may only be waived by the executive committee of the program.

# Programs of Study

Enrollment in other than registered or otherwise approved programs may jeopardize a student's eligibility for student-aid awards.

Courses are numbered as follows:

## 0100 – 0900

Core courses in School of Graduate Studies

## GRSC 0100 – GRSC 0900

Courses offered by individual graduate programs

## GBME 0100 – GBME 0900,

## GMCB 0100 – GMCB 0900,

## GNBS 0100 – 0900, etc.

## CIP CODES

### School of Graduate Studies Programs CIP Codes

Molecular and Cellular Biology	26.0204
Neural and Behavioral Science	30.2401
Biomedical Engineering	14.0501

## MOLECULAR AND CELLULAR BIOLOGY: PROGRAM OF STUDY

Fundamental Courses	Credits	Program Requirements
Molecular and Cellular Biology 1 .....	6	Mandatory
Molecular and Cellular Biology 2 .....	6	Mandatory
Graduate Biochemistry.....	4	Mandatory
Responsible Conduct in Research .....	1	Mandatory
<b>Major Courses (choice of 2 required)</b>		
Developmental Biology .....	3	Major Elective
Virology .....	3	Major Elective
Molecular Genetics .....	3	Major Elective
Advanced Molecular Immunology .....	3	Major Elective
Genomics and Proteomics .....	3	Major Elective
<b>Electives</b>		
Human Immunology .....	2	Elective
<b>Seminars, Journal Clubs, and Other Requirements</b>		
Seminar Series in Molecular and Cellular Biology .....	0.5 - 1.0	Mandatory, all years
Research Topics in Biomedical Science .....	0	Mandatory, first year
Current Topics in Cell and Developmental Biology (Journal Club) .....	1	Elective
Lipid and Vascular Biology .....	1	Elective
Microbiology and Immunology Seminar Series .....	1	Elective
Research Techniques (laboratory rotation) .....	3	2 rotations required
Teaching .....	0	50 hours required
Work in Progress Seminars .....	0.5 - 1.0	Attendance and annual presentation required
<b>Total Credit Requirement:</b> .....	<b>46 Credits</b>	

## NEURAL AND BEHAVIORAL SCIENCE: PROGRAM OF STUDY

<b>Fundamental Courses</b> .....	<b>Credits</b> .....	<b>Program Requirements</b>
Graduate Biochemistry.....	4 .....	Mandatory
Introduction to Cellular and Molecular Neuroscience .....	5 .....	Mandatory
Neuroscience Block of First-Year Medical Course (includes lab) .....	6 .....	Mandatory
Responsible Conduct in Research .....	1 .....	Mandatory
<b>Major Courses (choice of 2 required)</b>		
Molecular and Cellular Biology 1 .....	4 .....	Major Elective
Molecular and Cellular Biology 2 .....	4 .....	Major Elective
Gross and Cellular Neuroanatomy .....	3 .....	Major Elective
Mathematical Modeling in Life Sciences .....	2 .....	Major Elective
Cellular Physiology and Biophysics .....	3 .....	Major Elective
Membrane Function and Junctional Transmission .....	2 .....	Major Elective
Principles of Instrumentation in Neuroscience.....	2 .....	Major Elective
Dendritic Spines: Structure, Function, and Plasticity .....	2 .....	Major Elective
Developmental Biology .....	3 .....	Major Elective
<b>Electives Grouped by Theme</b>		
<b>Biophysics</b>		
Current Topics in Physiology and Biophysics.....	2 .....	Elective
Directed Readings in Electrophysiology .....	3 .....	Elective
<b>Developmental Neurobiology</b>		
Current Concepts in Developmental Neuroscience .....	2 .....	Elective
<b>General Neuroscience</b>		
Selected Topics in the Limbic System.....	3 .....	Elective
Directed Readings in Neuroscience .....	2 .....	Elective
Discussions in Behavioral Neuroscience .....	1 .....	Elective
<b>Molecular Neuroscience</b>		
Reverse Genetics for Neuroscientists .....	3 .....	Elective
(includes lab component).....	4 .....	Elective
Current Topics in Experimental Pathology (Neuropathology) .....	1 .....	Elective
Human Immunology .....	3 .....	Elective
Proteomics and Genomics .....	1 .....	Elective
Biochemistry: Protein Structure and Function .....	4 .....	Elective
Advanced Immunology .....	3 .....	Elective
<b>Neuropharmacology</b>		
Directed Readings in Neuropharmacology .....	2 .....	Elective
Current Topics in Neuropharmacology .....	1 .....	Elective
Pharmacology Methods and Experimental Pharmacology .....	2 .....	Elective
Selected Topics: Pharmacology of Cell Death.....	1 .....	Elective
<b>Seminars, Journal Clubs, and Other Requirements</b>		
Seminar Series in Neuroscience .....	0.5 - 1.0 .....	Mandatory, all years
General Neuroscience Journal Club .....	1 .....	Choice of journal club, mandatory, all years
Molecular and Cellular Neuroscience Journal Club .....	1 .....	Choice of journal club, mandatory, all years
Research Techniques.....	3 .....	2 lab rotations required
Teaching.....	0 .....	50 hours required
Work in Progress Seminars .....	0.5 - 1.0 .....	Attendance and annual presentation required
<b>Total Credit Requirement: .....</b>		
<b>46 Credits, 14 Credits Mandatory</b>		
<b>(exclusive of seminar, journal clubs)</b>		

# Courses of Instruction

## **GMCB 0201**

### **Molecular and Cellular Biology I**

*Stacy Blain, PhD*

This course provides the molecular foundation for students in the MCB Doctoral Program. Each week there are two 2-hour lectures and one 2-hour discussion period. Topics include DNA chemistry, replication and repair; transcriptional machinery in prokaryotes and eukaryotes; regulation of transcription; RNA processing; protein synthesis; gene regulation in prokaryotes; chromatin structure, function and remodeling; genetics in the age of genomics; epigenetic regulation of gene expression in higher eukaryotes; molecular immunology; site-specific recombination; lambda; VDJ and class switching; gene conversion; and hypermutation. Discussion sessions constitute an important part of the course and introduce students to the critical reading of research papers. Course instructors will assign 1-2 research articles the week before the corresponding lectures. Students should read the articles thoroughly before the session and be prepared to discuss them. The level of participation will be noted.

Exam questions are taken from material covered in both lectures and discussion sessions. Essay questions are designed to test integrative knowledge rather than knowledge of simple, factual details. Students should be prepared to propose experiments that will test a given hypothesis or idea.

Reference text: It is recommended that students purchase the latest edition of either *Molecular Biology of the Cell*, Alberts, et al. (Garland Publishing Inc.), or *Molecular Cell Biology*, Lodish, et al, (W. H. Freeman and Co.). Offered annually in the fall semester.

*6 credits.*

## **GMCB 0202**

### **Molecular and Cellular Biology II**

*William Chirico, PhD*

This first-year graduate-level course is designed to provide students in the MCB Doctoral Program with a broad background in cellular biology. The course is divided into three sections: cell structure/function, cell signaling, and cell development. Each week there are two 1.5-hour lectures and one 1.5-hour journal discussion period. The lectures cover topics and experimental approaches used in cell biology.

The purpose of the discussion groups is to reinforce the information and concepts presented during the lectures. Students critically review at least one representative publication during each discussion period. The paper, which is chosen by the instructor, is available one week before the class meeting. Each student is responsible for all aspects of the discussion paper. Students are selected at random to describe the purpose of the experiment, present the methods and results, and critically evaluate the paper.

An exam is given at the end of each section of the course. Questions may have different formats, including but not restricted to short answer, essay, and experimental design. Exam questions may cover lecture and discussion material. Students are evaluated on their contributions to the discussions as well as on their performance on exams.

Reference text: It is recommended that students purchase the latest edition of either *Molecular Biology of the Cell*, Alberts, et al. (Garland Publishing Inc.), or *Molecular Cell Biology*, Lodish, et al, (W. H. Freeman and Co.). Offered annually in the spring semester, meets twice per week for 1.5 hours each session.

*6 credits.*

## **MCB 0203**

### **Research Seminars in Molecular and Cellular Biology**

*Ming Zhang, MD, PhD; Ed Quadros, PhD; William Chirico, PhD*

Research seminars are presented by Downstate faculty and visiting speakers. Once every other week in the fall and spring semesters. Mandatory attendance. *½ -1 credit per semester.*

## **GBIO 0203**

### **Graduate Biochemistry**

*Greg Gick, PhD*

Graduate Biochemistry is one of two courses in the Graduate School Core Curriculum. It is a lecture course that meets three times a week for 1.5-hours per session. Topics include proteins, protein purification and analysis, enzymes and kinetics, bioenergetics, carbohydrate chemistry, lipid metabolism, amino-acid metabolism, nucleotide metabolism, metabolic integration, and hormone signaling. Grades are based on the results of four written examinations and one oral presentation. The topic of the oral presentation is selected at random by the instructor from eight assigned topics, all of which must be prepared.

There is no required text; individual lecturers suggest a written source of information to supplement the lecture material.

Offered annually in the fall semester; MCB students take the course in the first year; NBS students take the course in the second year.

*4 credits.*

**GRSC 0500**  
**Responsible Conduct in Research**

*Kathleen Powderly, CNM, PhD*

This course is designed to acquaint PhD and MD/PhD candidates in the sciences with the ethical and legal principles and practices that will guide the manner in which they conduct and report scientific research now and in the future. The goals of the course are to provide an ethical framework from which to identify and consider dilemmas arising in the course of their or other's research, to create an appreciation of the importance and value of ethical principles to science, and to become sensitive to the ethical and legal implications and questions that surface in the pursuit of new and untried scientific discoveries.

To assure a better fusion of science and ethics, the course is taught by a team consisting of an attorney/ethicist and a scientist. The ethicist, Dr. Kathleen Powderly, provides the continuity and consistency of material while the scientist, a faculty member, brings the scientific perspective, methodology, and context. Experts in areas such as patent law may be invited as guest lecturers.

The course is planned to begin at a point that would be most logical—the beginning of a research project—and proceed along the continuum of scientific research: how a project is developed and structured; if and how it gets funded; who gets credit; what, where, and how it gets published; what can go wrong; what the implications of the research may be to human subjects and animal subjects; and what the implications of the research itself may be in a socioeconomic context. (Example: the Human Genome Project.) Instruction is both didactic and interactive. For each session, students are expected to read the assignment, reflect, and write a one-page paper on the material and be prepared to engage in in-depth discussions. The cultural diversity of the student body is not only acknowledged, but special efforts are made to explain differing cultural values. Spring semester.

*1 credit.*

**GRSC 0520**  
**Entrepreneurship in Academia**

*David Schoenhaut, PhD*

In this series of presentations, guest speakers representing several areas of expertise in biomedical technology entrepreneurship have been recruited to give students (all members of the Downstate community are also welcome) a first-hand view of the principles and challenges of beginning a biotechnology business venture. The focus is on information and experiences relevant to how laboratory research and clinical investigators at Downstate might proceed to commercialize concepts and discoveries emerging from their academic work. Presentations include personal narratives of the pathways taken by several biomedical entrepreneurs to start and grow their companies. Other topics covered will include: principles and protection of intellectual property, funding through the SBIR/STTR program, strategic business partnering, financing and structuring a biotechnology company, obtaining FDA approval for new clinical products, and the role of the University Technology Transfer Office in facilitating technology commercialization. Spring semester.

*1 credit.*

**GRSC 0700**  
**Scientific Writing**

*Richard Kollmar, PhD*

The objectives of this course are:

1. To understand the differences between thesis documents, scientific papers, and grant applications;
2. To develop strategies for planning and writing each type of scientific document;
3. To understand the review process for papers and grants;
4. To become familiar with resources that will offer detailed specific guidance for grant applications to the National Institutes of Health and other funding agencies; and
5. To understand how to locate funding opportunities, including those for students, postdoctoral fellows, and new investigators. Fall semester.

*1 credit.*

**GACB 0109**  
**Seminar Series in Lipid and Vascular Biology**

*M. Mahmood Hussain, PhD*

This seminar series is intended to expose graduate students to state-of-the-art developments in the fields of lipid, vascular biology, and atherosclerosis. World-famous investigators are invited to present their latest developments. Students get a chance for informal discussion with the speakers. Weekly, fall and spring semesters.

*½ - 1 credit per semester.*

**ANCB G-512**  
**Developmental Biology**

*Faculty*

The course is expected to broaden the students' exposure to current research in developmental biology. This advanced course combines faculty lectures and student presentations. Students introduce the topics by providing background information on the specific organ systems whose development is covered by the faculty lecture.

The required textbook is *Developmental Biology* (6th Edition), Scott Gilbert. For all student background sessions, appropriate chapters and sections from Gilbert are the primary source from which students should draw, followed by other textbooks or reference books that may have more in-depth information on a specific topic.

Each student confers with the faculty member for whom he or she is presenting background material, in order to obtain guidance on what information should be presented. Offered annually, the class meets once a week for 2 hours.

*3 credits.*

**GBME 0518**  
**Genomics and Proteomics**

*Faculty*

This course is designed to introduce students studying molecular and cellular biology to the emerging fields of functional and comparative genomics and proteomics. The course consists of 12 lectures given by various SUNY faculty, and student literature presentations based on the lectures. Genomics topics include microbial genomes, small eukaryotic genomes, the human genome, and metagenomics. Proteomics topics include functional and structural genomics, chemical genomics, principles of protein crystallization, and analytical methods and applications. Reading and homework

are assigned for each lecture. Each student is expected to present two 20- to 30-minute PowerPoint presentations on assigned journal articles. The course meets once a week for 2.5 hours for 12 weeks. Fall semester.

*3 credits.*

### **GBME 0610 Cellular and Molecular Neuroscience**

#### *Faculty*

This course provides a comprehensive overview of cellular neuroscience and consists of 20 lectures and two exams. The course is roughly divided into three parts. The first part concentrates on the physiology and biophysics of neurons and includes topics such as bioelectricity, ion channels, and membrane potentials. The second part concentrates on neuronal signal transduction, gene expression, and transport of RNA and protein, and includes such topics as second messengers and regulation of mammalian adenylyl cyclases. The third part is an in-depth look at synaptic transmission and plasticity, including such topics as neurotransmitters and neuropeptides, neurotransmitter receptors, presynaptic activity, and the neuromuscular junction.

Recommended textbooks are *Essentials of Neural Science and Behavior*, 1st edition, Eric R. Kandel, James H. Schwartz, Thomas M. Jessell (Appleton & Lange); *Principles of Neural Science*, 4th edition, Eric R. Kandel, James H. Schwartz, Thomas M. Jessell, (Appleton & Lange), and *Basic Neurochemistry*, 6th edition, editor-in-chief: George J. Siegel, MD (Lippincott, Williams & Wilkins). Fall semester.

*3 credits (or 5 credits, including a mini-course on hippocampal circuitry).*

### **GBME 0620 Biomedical Imaging I**

#### *Faculty*

The objective of the course is to provide a thorough grounding in the mechanisms and concepts related to image acquisition and subsequent image processing in various biomedical imaging modalities. Course material falls into two broad principal areas: an extensive overview of mathematical and physical considerations in instrumentation common to all forms of biomedical imaging, and an in-depth treatment of specific modalities. The latter includes imaging based on interactions of tissue with ionizing radiation (x-ray; CT; single-photon emission-computed tomog-

raphy, or SPECT; and positron emission tomography, or PET; or with acoustic energy; i.e., ultrasound imaging).

In depth treatment of the physical and mathematical considerations specific to magnetic resonance imaging (MRI) is taken up in the second half of the course: Biomedical Imaging II. A single 3-hour lecture session takes place once a week in the evening. Sets of homework problems are assigned every other week for evaluating students' comprehension of lecture topics on an ongoing basis, and also for determining a fraction of the students' final course grades. Supplemental readings are supplied by the instructors as needed. Spring semester.

*3 credits.*

### **GBME 0621 Biomedical Imaging II**

#### *Faculty*

This course introduces the mechanisms and concepts related to image acquisition and subsequent image processing and image formation in various biomedical imaging modalities. Building on material covered in Biomedical Imaging I, the second semester of the imaging sequence focuses on advanced topics such as functional magnetic resonance imaging (fMRI), ultrasound imaging, biomagnetic imaging, and optical tomographic imaging (OTI).

The goals of the course are to introduce students to basic instrumentation and physical processes underlying biomedical imaging and to make them aware of data collection in basic biomedical imaging modalities and how to obtain cross-sectional images from tomographic data sets for various imaging modalities. The course demonstrates the importance of general signal-processing tools for biomedical image processing. The class meets once a week for 3 hours. Fall semester.

*3 credits.*

### **GBME 0650 Signals, Instrumentation and Systems in Bioengineering: Models and Application**

#### *John N. Carter, PhD*

This course covers how to understand the design of systems for interrogating, stimulating, and augmenting biological systems. The course will endeavor to show the connection between mathematical engineering models and real-world applications. Wherever possible, the application will be demonstrated. Fall semester.

*2 credits.*

### **GBME 0655 Biomedical Instrumentation II**

#### *John N. Carter, PhD*

A project-driven course, specifically geared to the future needs or hopes of the students in signal acquisition, processing and control. The course is based on instrumentation amplifiers, analog-to-digital convertors and either desktop computers or micro controllers. This might include IR spectra collection from skin for metabolite concentration profiling. One element driving the decision will be what resources are available to carry out the curriculum. Biomedical Instrumentation (GBME 0650), a background in computer signal processing or permission of the instructor will be the prerequisites for the new course. Spring semester.

*2 credits.*

### **GBME 0660 Microcontroller Practicum**

#### *John N. Carter, PhD*

Hands-on course on micro-controllers, their programming and use in real-world applications: Assembly language programming; C language programming; micro-controller fundamentals; programming micro-controller for applications: serial devices, EEPROM use, analog-to-digital conversion and timers/pulse-width modulation; and real-time programming (real-time operation/communications: how a real-time executive/scheduler functions). The C programming is based on ANSI C (plus micro-controller extensions) and once learned can be applied to any application and/or environment that supports the language. Assembly language is at the level of machine code, where the user has direct control over all operations of the computing engine. Again, once you learn assembler you can learn the assembler for another platform by studying some specific rules such as addressing-modes and instruction types. This, however, is not that difficult—once you have seen one assembler you have seen them all. Micro-controllers are essentially microcomputers that can interface with the real world. Most of what you learn could be useful in your lab work, as a solid introduction into programming and will give you a leg-up in evaluating electronics hardware you may need to buy or have made in the future. Spring semester.

*2 credits.*

**GBME 0945**  
**Recombinant DNA Technology:  
A Practical Approach**

*Faculty*

The course consists of lectures and demonstrations given one evening a week for two hours. It covers practical aspects of recombinant DNA technology, including fundamental aspects of gene expression, restriction enzyme cleavage, plasmids, cloning, genetic transformation of bacteria, protein expression vectors, basic principles of protein purification, and manipulation of cloned genes (site-directed mutagenesis).

Laboratory demonstrations illustrate the following methodologies: digestion of DNA with restriction endonucleases and resolution of DNA fragments by gel electrophoresis; cloning vectors; genetic transformation of bacteria; screening of recombinant plasmids by protein expression; purification of recombinant fusion proteins by affinity chromatography. Spring semester.

*3 credits.*

**GMCB 0101**  
**Advanced Virology**

*Faculty*

The course offers an in-depth consideration of the replication and biology of the 17 major animal virus groups. In addition to molecular aspects of viral replication, the following topics are covered: interferons, vaccines, virus-cell interactions, and host response to viral infections. Spring semester alternate years.

*3 credits.*

**GMCB 0120**  
**Work-in-Progress Seminars**

*Stacy Blain, PhD*

Each MCB student is required to present a research seminar to members of the program annually. Mandatory attendance. Weekly, fall and spring semesters.

*½ - 1 credit per semester.*

**GMIC 0105**  
**Seminar Series in Microbiology  
and Immunology**

*Christopher Roman, PhD*

A series of presentations by invited scientists and Downstate faculty. Ongoing research is discussed to keep the audience abreast of current developments. Fall and spring semesters.

*½ - 1 credit per semester.*

**GMIC 0113**  
**Molecular Genetics**

*Faculty*

Molecular Genetics is one of the designated courses that satisfies the MCB doctoral program requirement of two advanced courses. The course comprises three main topics. The first topic, DNA chips and microarrays, concerns the development and application of DNA assays in molecular biology. After the introductory lecture, individual students present assigned papers from a list of source documents. The second topic is an exploration of in vivo and in vitro aspects of translational control in prokaryotic cells. After an initial review of the current state of the field, subsequent lectures explore translational initiation; mRNA determinants; ribosomes and ribosomal protein S1; mRNA higher-order structure; and diverse mechanisms for translational regulation. The third topic, in vivo and in vitro chromatin remodeling, explores aspects of the mechanisms of ATP-dependent chromatin remodeling by Snf-Swi and Snf-Swi-related complexes in yeast, *Drosophila*, and human cells. The research papers that are discussed describe in detail the genetic screens in which Snf and Swi mutants were first identified, the molecular, genetic, and biochemical evidence for a direct link between Snf-Swi and alterations in chromatin structure, and the biochemistry of ATP-dependent nucleosome remodeling. The class meets twice a week for 2 hours. Spring semester.

*3 credits.*

**GMIC 0520**  
**Advanced Molecular Immunology**

*Faculty*

The goal of this course is to familiarize the student with the body of research that forms the foundation of our present understanding of the molecular basis of the immune response and the cellular interactions that regulate it. The principal tool for learning this material is the reading and discussion of research papers in immunology. A small group of students is supervised by a faculty member active in the specific research area. Topics to be studied include antibody structure; B-cell development; T-cell structure and development; T-cell-MHC interaction; MHC structure and antigen processing; complement chemistry; complement and Fc receptor structure and function; transplantation; immunogenetics; mucosal immunology; and allergic reactions.

Students are given research papers and complementary review articles on these topics to study for one week. The papers are then discussed in a two-hour session with the purpose of integrating the scientific findings and enhancing the students' insight into fundamental immunological processes and knowledge of research techniques and experimental approaches. Students become familiar with the need to develop model systems to address certain scientific problems. The final exam, in essay form, tests students' ability to develop a research protocol for a posed problem in at least two of the topics discussed during the course. Prerequisites for this course are completed courses in Biochemistry, Cell and Molecular Biology, and a solid knowledge of Basic Immunology. Spring semester.

*3 credits.*

**GNBS 0102**  
**Neural and Behavioral Science  
Seminars**

*Faculty*

An outstanding series of advanced research seminars that exposes students to world leaders in their respective fields from other institutions as well as to faculty who participate in the Neural and Behavioral Science Program. Weekly, fall and spring semesters.

*½ - 1 credit.*

**GNBS 0120**  
**Work-in-Progress Seminars**

*Faculty*

Student participation in a work-in-progress seminar in which each student presents an annual seminar on his or her research to other students and faculty of the program. Weekly, fall and spring semesters.

*½ - 1 credit per semester.*

**GNBS 0209**  
**Principles of Instrumentation in  
Neuroscience**

*Faculty*

This course reviews the theory, design, and use of instruments for neuroscience research (emphasis on neurophysiology). Instruments for recording electrical activity from single neurons and populations, stimulation of excitable cells, signal processing, and data reduction and analysis are covered by faculty. Also included are clinical contributions on neurorobotics applications in surgery and neuroengineering aspects of orthopedics. Spring semester.

*3 credits.*

**GNBS 0210****Dendritic Spines: Structure, Function, and Plasticity***Ilham Muslimov, MD, PhD; Henri Tiedge, PhD*

Dendritic spines are protrusions along the surface of dendrites that receive synaptic input from axonal terminals. Although discovered over a century ago by Santiago Ramon y Cajal, it has become clear only in recent years that dendritic spines, in their capacity as postsynaptic microcompartments, are focal points for long-term structural and functional modulations of synaptic transmission. With tens of thousands of spines per dendritic arbor of a typical principal neuron (e.g., a pyramidal cell), the potential for input-specific modulation is immense. Novel experimental approaches, using techniques ranging from molecular to imaging, have now provided remarkable insights into structural and functional spine plasticity. The goal of this advanced course is for the student to develop an in-depth understanding of the mechanisms as well as the biological relevance of such plasticity. The course begins with introductory lectures and moves on to discussions of specific recent papers on the subject matter. Successful participation will be evaluated based on the presentation of papers, active participation in the discussions, and completion of a mini-review of a selected topic that was discussed in the course. Fall and spring semesters.

*2 credits.***GNBS 0220****Mathematical Modeling in Life Sciences: Computational Neuroscience***William Lytton, PhD*

This course offers an introduction to mathematical modeling of the nervous system. Basic concepts in computer science, linear algebra, and numerical analysis are reviewed for insights they can bring to the understanding of the brain. Central concepts are presented from computer science (pointer manipulation, software/hardware dichotomy), artificial neural networks (Hopfield networks, error learning, back-propagation), and realistic neuron modeling (compartment modeling, Hodgkin-Huxley equations). A goal of the course is to teach students how to use linear algebra and differential equations to model neural activity, and how to use the neural modeling software NEURON. The course should enable students to read and understand basic literature concerning neural modeling. Annually.

*3 credits.***GNBS 0230****Reverse Genetics for Neuroscientists***Ellen Hsu, PhD*

This course introduces students to the applications of recombinant DNA technology for gene cloning and for the study of gene structure and function. Selected papers on specific techniques or approaches are presented and discussed, beginning with gene isolation and gene characterization, followed by functional studies using transfection, transgene, and gene-replacement techniques. Some limited laboratory work is included. The course is offered when sufficient numbers of students demonstrate an interest by writing to the course director.

*4 credits.***GNBS 0240****Gross and Cellular Neuroanatomy Faculty**

An advanced neuroanatomy course that reviews specific methods for fixation, staining, and imaging tissue. A particular method or small set of related methods is chosen at the course outset for review during the semester. Lectures are supplemented with text and original literature readings. Actual use of techniques and microscopy as available.

*3 credits.***GNBS 0250****Cellular Physiology and Biophysics***Faculty*

This course covers the basic concepts of equilibrium thermodynamics, molecular-interactions, and kinetics. Basic membrane processes, including membrane potentials, channels, active transport, and exocytosis are covered, with special emphasis on excitable cells. Ligand-receptor interactions, second messenger systems, and other signaling mechanisms are reviewed.

*2 credits.***GNBS 0504****Membrane Function and Junctional Transmission***Faculty*

A reading and discussion course that traces the development of the understanding of fundamental signaling mechanisms within and between cells in the nervous system. Original papers (both historic and current) are used as focal points for discussion.

*2 credits.***GNBS 0100****Neuroscience***John Kubie, PhD*

The course consists of lectures, neuroanatomy laboratory exercises, neurophysiology labs, and conferences. It is taught in conjunction with the Neuroscience Block (MS 101) that is given in the first year of the medical school curriculum. Therefore, most course activities are taught to a mix of graduate and medical students. The 38 lectures survey cellular neuroscience, but focus on systems and behavioral neuroscience. In the six sessions (18 hours) of neuroanatomy gross lab, students use whole brains, sections, and dissections to guide learning. In the two sessions (6 hours) of neurohistology lab, students are taught the general properties and histological appearance of nervous tissues as well as the microscopic anatomy of the cerebral cortex, eye, and ear. In the three sessions (6 hours) of pathway review, students use myelin-stained material to review brain connectivity. There are two neurophysiology lab sessions, one focusing on membrane physiology and the other on reflexes. Students are evaluated with two practical exams and a written exam. The practical exams, identical to the ones given to medical students, cover gross brain anatomy, neurohistology, and myelin-stained human brain sections. The written exam is an essay exam. Spring semester.

*6 credits.***GPTH 0110****Human Immunology***Faculty*

The objective of this course is to provide a thorough understanding of human immunology in the context of human disease and clinical laboratory immunology. Course material includes immunological mechanisms of disease, including allergy, atrophy connective tissue diseases (rheumatoid arthritis, systemic lupus erythematosus, psoriasis), immunodeficiency states, neuroimmunology, and immune response to infections. The course also covers principles, methods, and interpretation of diagnostic immunology tests. The course covers two weeks of intense training, with lectures and discussion sessions, student presentations, and "hands-on" experience in clinical laboratories. There are daily morning sessions (2-3 hours) and afternoon lecture/discussion sessions (2-3 hours). Spring semester.

*2 credits.*



# Joint Doctoral Program in Biomedical Engineering (BME) with Polytechnic Institute of New York University

## INTRODUCTION

This interdisciplinary doctoral program is jointly administered by both SUNY Downstate's School of Graduate Studies and Polytechnic Institute of New York University. It is a product of the Strategic Alliance for Fostering Research and Education in Biomedicine and Bioengineering. The first BME PhD students entered in 2006. The doctoral program builds on Polytechnic Institute's successful MS program in Biomedical Engineering in which Downstate faculty members mentor student research projects on their own campus. The two campuses are located only 20 minutes apart by either subway or car.

The following two thesis tracks are offered: i) Biomaterials and Polymer Therapeutics, and ii) Bioimaging and Neuroengineering. These tracks reflect areas of research in which the two institutions have been strong for many years. Faculty members' interdisciplinary research includes neurorobotics; neuroengineering, using wireless technology for "search and rescue" rats; optical tomography, a new method of imaging biological tissue using light at near infrared wavelengths; computational neurobiology and brain modeling; bioresorbable material synthesis and processing for applications in tissue engineering, drug delivery, bone screws and more; biosensors for rapid detection and analysis of biological markers; liposome and polymeric drug delivery systems; and new glycolipids that function as effective modulators of the immune response, anticancer agents and adjuvants in vaccine formulations.

## PhD DEGREE

The PhD Biomedical Engineering (BME) program accommodates students from diverse academic backgrounds by offering three entry-level pathways that ensure a solid foundation in both biology and engineering. Advanced PhD BME students select one of the two the-

sis tracks: i) Biomaterials and Polymer Therapeutics, or ii) Bioimaging and Neuroengineering.

Students are required to take at least one Management of Technology course and to participate in a short course called Responsible Conduct in Research. BME students are obliged to attend a BME Seminar Series (at Downstate) or a Colloquium (at Polytechnic). A total of 46 course credits is required.

BME PhD students are expected to pursue at least one semester of experience in wet lab and cell culture. Thesis research is conducted under the supervision of a member of the PhD BME program faculty from Downstate or Polytechnic. Students are broadly trained, with opportunities for exposure to various potential career paths through laboratory rotations at industrial sites in i) Downstate's Advanced Biotechnology Incubator, located adjacent to the campus; ii) the BioBAT, a biotechnology center in the Brooklyn Army Terminal, developed by collaboration between the New York City Economic Development Corporation and SUNY Downstate; and iii) Polytechnic's Center for Biocatalysis and Bioprocessing of Macromolecules, a National Science Foundation Industrial/University Cooperative Research and Education Program, located on that campus. Full tuition fellowships and stipends are available.

## MD/PhD DEGREES

In the case of students who are candidates for both the MD in the College of Medicine, and the PhD in Biomedical Engineering, requirements for the PhD are similar to those for students who are candidates for the PhD in Biomedical Engineering only. In the first two years of the program, students follow the standard curriculum of the College of Medicine. MD/PhD

students usually spend four years in the School of Graduate Studies taking required courses and pursuing research leading to a PhD thesis. Upon completion of the PhD degree, students return to the College of Medicine to complete their clinical training. As in all SUNY degree-granting programs, academic credits for courses taken in the College of Medicine are transferable up to a maximum of 24 credits toward the PhD degree.

All MD/PhD students are expected to work in research laboratories during the first two summers of their medical school tenure. Members of the MD/PhD committee as well as individual faculty members are available to discuss these options and offer constructive advice to help students select a sponsor. Students may complete their PhD work in either of the two tracks.

In general, MD/PhD students are supported with both a stipend and a tuition scholarship throughout the medical and graduate school years.

## ADMISSIONS

PhD BME program applications are reviewed by an admissions committee composed of faculty from both the SUNY Downstate School of Graduate Studies and Polytechnic Institute of New York University. Course requirements for admission to the PhD BME program are the following: at least two appropriate level courses in advanced mathematics and biochemistry, plus courses in physics, biology and/or computer science that are consistent with the candidate's intended research area. Experience with LABVIEW and MATLAB programs is desirable. In general, other admissions policies and procedures are similar to those for the other two doctoral programs administered by the School of Graduate Studies.

## BIOMEDICAL ENGINEERING: PROGRAM OF STUDY

### A. Bridge Courses

Biomedical Science:	Credits
BME G 650..... Biomedical Instrumentation .....	3.0
BME G 945..... Recombinant DNA Technology: A Practical Approach .....	3.0
BME G 950..... Principles of Biological Systems .....	3.0
Computer Science Engineering:	
CS 530..... Introduction to Computer Science .....	3.0
CS 580..... Computer Architecture and Organization .....	3.0
Chemical Engineering:	
CH 900..... Selected Topics in Chemical Engineering I .....	variable
CH 901..... Selected Topics in Chemical Engineering II .....	variable
Electrical Engineering:	
EL 536..... Principles of Communication Networks .....	3.0
EL 547..... Introduction to VLSI System Design .....	3.0
EL 641..... Analog & High Frequency Amplifier Design .....	3.0

### B. Core Engineering Courses:

#### Biomaterials and Polymer Therapeutics Track:

BE 670..... Materials in Medicine .....	3.0
BE 952..... Natural Polymers and Materials .....	3.0
BE 6103..... Human Anatomy & Physiology I .....	3.0
BE 6113..... Anatomy, Physiology & Biophysics II .....	3.0
CM 771..... Introduction to Polymer Science .....	3.0
CM 782..... Macromolecules in the Solid State .....	3.0
MT 600..... Structure-Property Relationships in Materials .....	3.0
MT 620..... Plastic Deformation and Fracture .....	3.0
BE 660..... Drug Delivery .....	3.0
BE 650..... Tissue Engineering .....	3.0
BE 9433..... Protein Engineering .....	3.0
BE 6753..... Orthopedic Biomechanics & Biomaterials .....	3.0
CH 633..... Transport Phenomena .....	3.0
CH 773..... Thermodynamics I .....	3.0
CH 781..... Chemical Reactor Analysis and Design .....	3.0

#### Bioimaging and Neuroengineering Track:

CS 667..... Neural Network Computing .....	3.0
EL 501..... Wireless Personal Communication Systems .....	3.0
EL 536..... Principles of Communication Networks .....	3.0
BE 6103..... Human Anatomy & Physiology I .....	3.0
BE 6113..... Anatomy, Physiology & Biophysics II .....	3.0
BE 6223..... Image Processing .....	3.0
BE 6403..... Signals, Systems, Transforms .....	3.0
EL 522..... Sensor Based Robotics .....	3.0
BME G 220..... Mathematical Modeling in Life Sciences: Computational Neuroscience .....	3.0
BME G 620..... Biomedical Imaging I .....	3.0
BME G 621..... Biomedical Imaging II .....	3.0

### C. Core Biomedical Science Courses:

#### Biomaterials and Polymer Therapeutics Track:

MCIM G 105..... Seminar Series in Microbiology and Immunology .....	1.0
ANCB G 109..... Seminar Series in Lipid and Vascular Biology .....	1.0
MCB G 113..... Molecular Genetics .....	4.0
MCB G 120..... Work in Progress Seminars .....	0.5 - 1.0
MCB G 201..... Molecular and Cellular Biology I .....	6.0
MCB G 203..... Molecular and Cellular Biology Seminar Series .....	0.5 - 1.0
BIOC G 203..... Graduate Biochemistry .....	4.0
CM 941..... Biochemistry I (graduate level) .....	3.0

CM 942.....	Biochemistry II (graduate level) .....	3.0
CORE G 300 .....	Research Techniques (laboratory rotations) .....	3.0
MCB G 500.....	Directed Readings in Molecular and Cellular Biology .....	1.0 – 3.0
MCB G 510.....	Current Topics in Cellular and Developmental Biology .....	1.0
MCB G 512.....	Developmental Biology .....	3.0
BME G 518.....	Genomics and Proteomics .....	3.0
BME G 945.....	Recombinant DNA Technology: A Practical Approach .....	3.0

#### Bioimaging and Neuroengineering Track:

NBSC M 100-N.....	Neuroscience .....	6.0
NBSC G 100 .....	Journal Club in Neural and Behavioral Science .....	0.5 - 1.0
NBSC G 102.....	Neural and Behavioral Science Seminar Series .....	0.5 - 1.0
NBSC G 105.....	Journal Club Molecular and Cellular Neuroscience .....	1.0
BME G 610.....	Cellular and Molecular Neuroscience .....	3.0
NBSC G 120.....	Work in Progress Seminars .....	0.0
NBSC G 200.....	Discussions in Behavioral Neuroscience .....	2.0
NBSC G 202.....	Selected Topics in the Limbic System .....	3.0
NBSC G 210.....	Dendritic Spines: Structure, Function, Plasticity .....	2.0
CORE G 300 .....	Research Techniques (laboratory rotations) .....	3.0
NBSC G 500.....	Directed Readings in Neuroscience .....	3.0
MCB G 520.....	Advanced Immunology .....	3.0
BME G 620.....	Biomedical Imaging I .....	3.0
BME G 621.....	Biomedical Imaging II .....	3.0

#### D. Other Courses

CORE G 500 .....	Responsible Conduct in Research .....	1.0
CORE G 301 .....	Advanced Topics in Responsible Conduct in Research .....	3.0
.....	SUNY/Poly BME Seminars .....	0.5 - 1.0

#### E. Elective Courses

PATH G 103.....	Current Topics in Experimental Pathology .....	1.0
PATH G 106.....	Immunological Aspects of Atopic and Related Diseases .....	3.0
PHRM G 106.....	Current Topics in Neuropharmacology .....	1.0
CM 753.....	Bioinformatics I: Sequence Analysis .....	3.0
CM 754.....	Bioinformatics II: Protein Structure .....	3.0
MCB G 202.....	Molecular and Cellular Biology II .....	6.0
MCB G 203.....	Molecular and Cellular Biology Seminar Series .....	0.5 - 1.0
BE 601.....	Molecular Immunology .....	3.0
BE 630.....	Transport Phenomena in Biological Systems .....	3.0
BE 6753.....	Orthopedic Biomechanics & Biomaterials .....	3.0
CM 905.....	Enzyme Catalysis in Organic Synthesis .....	3.0
CM 906.....	Combinatorial Chemistry .....	3.0
CORE G 520 .....	Entrepreneurship in Academia .....	1.0
PATH G 508.....	Immunopathology of Virus Infections .....	2.0
PATH M 110 .....	Human Immunology .....	2.0
PHRM G 100.....	Pharmacology Methods and Exp. Pharmacology .....	2.0
BME G 640.....	Modern Drug Discovery .....	3.0
BME G 650.....	Biomedical Instrumentation .....	3.0

#### F. Management of Technology Courses

MG 865.....	Managing Innovation .....	3.0
MG 603.....	Organizational Behav. and Mgmt. Processes in Innovative Corps .....	3.0
MG 693.....	Information Technologies, Systems and Mgmt. in Organizations .....	3.0
MG 786.....	High-Technology Entrepreneurship .....	3.0
MG 775.....	Operations Mgmt. for Knowledge-based Enterprises (1/2 semester) .....	3.0
MG 795.....	Global Innovation (1/2 semester) .....	3.0
MG 820.....	Project Management and Assessment for Technology Managers .....	3.0
MG 785.....	High-Technology Leadership .....	3.0
MG 784.....	Negotiation in Technology-Intensive Sectors .....	3.0
MG 787.....	Intellectual Property for Technology and Information Managers .....	3.0
MG 797.....	Financing the Value Creation .....	3.0

#### G. Thesis Research

G999.....	Ph.D. Thesis Research in Biomedical Engineering @ Downstate	
	PhD. Thesis Research in Biomedical Engineering @ Polytechnic	

# University Resources

Facilities for Instruction

University Services

Student Life

Student Organizations

## Facilities for Instruction

### **PUBLIC HEALTH/ACADEMIC BUILDING**

Downstate's Public Health/Academic building is scheduled to be completed in 2016. The building will house Downstate's School of Public Health, classrooms and lecture halls for the College of Medicine and other academic units, and several floors of research labs. The architecture will reflect changing approaches to the teaching of medicine: classrooms will be designed to facilitate multidisciplinary instruction of small groups, as well as take advantage of new technology, including a simulation center.

### **BASIC SCIENCES BUILDING**

The Basic Sciences Building houses the School of Graduate Studies, with space for research, education, and administrative functions. The facility supports basic and clinical research and is used by students in both the School of Graduate Studies and the College of Medicine.

The 541,000-square-foot facility has laboratories for both basic and clinical research, as well as offices for faculty and four lecture halls. The Basic Sciences Building gives students and faculty access to highly specialized research equipment, including, for example, a DNA sequencing facility, electron microscopy, computer-based gel documentation and image analysis, phosphorimaging, and a protein-sequencing center.

### **HEALTH SCIENCE EDUCATION BUILDING**

The campus's Health Science Education Building (HSEB) houses classrooms, laboratories, a 500-seat auditorium, and the Medical Research Library of Brooklyn. Included in the HSEB are two floors of study carrels

with lockable storage, which serve as "home base" for medical students during their first two years. The carrels are located in multidisciplinary laboratory sites. This arrangement fosters small-group learning. The carrels are equipped with power and data lines.

### **MEDICAL RESEARCH LIBRARY OF BROOKLYN**

Downstate's library occupies three floors of the Health Science Education Building and is accessible from the 395 Lenox Road entrance.

The 24/7 Library Information Commons provides comfortable seating for individual and groups; computers and ports, power, printing, and reference service while staff are present.

### **Resources**

The nucleus of the library was formed when the Academy of Medicine of Brooklyn and SUNY Downstate merged in the 1960s.

The collections date from the early eighteenth century, and include an archive of historical materials relating to the history of medicine in Kings County and at the Long Island College Hospital, SUNY Downstate's predecessor institution. These materials are cataloged and the holdings may be searched on the publicly accessible website: [library.downstate.edu](http://library.downstate.edu).

The library's website also provides access, both local and remote, to many other resources, including a significant number of electronic journals in full-text. Other resources include FirstSearch, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PubMed, InfoShare, NetLibrary, Info-Trac, and Lexis-Nexis. Remote access is validated through a proxy server.

All computers within the library are connected to the Internet. The library supports wireless connectivity to the Internet, and appropriately configured laptops may be checked out at the Access Services desk for two hours of in-house use.

### Services

- Access Services requires you to complete registration in the library's management system in order to take out materials from the library's collections. This unit also maintains the General Reserve collection, the Special Reserve, which is course-specific and may be available electronically as an E-Reserve item on the library web page. Group study rooms are also available from this unit.
- Inter-Library Loan will procure materials that are not available in the library. These materials may be requested through Illiad, which is found on the library's web page. Articles requested may be delivered in pdf format to clients' desktops.
- The Reference unit will conduct generic orientations or customized orientations upon request (718-270-7453). Course- or program-specific orientation or classes may be arranged. Librarians are on duty five days a week, and an online reference chat room that allows a real time chat with a librarian is also available along with e-mail reference. Print reference resources are available on the lower floor of the library.
- The Institute of Evidence-Based Practice serves all of the colleges, as well as the residency programs through curriculum-integrated sessions. The library has created internationally recognized EBM tutorials, which are available on the library's web page. Customized instruction is available.
- Learning Resource Services, located on the lower level of the library, comprises the Advanced Learning Resource Center (ALRC), Classroom Services, and the Audiovisual unit. A wide array of computer software and audiovisual programs is available.

The ALRC has over 100 seats configured in group and individual viewing rooms, carrels, and three computer-training rooms. Computer application tutorials are available on CDs.

- Classroom Services provides room scheduling and audiovisual services, as well as technical assistance to operate audiovisual equipment such as over-head, slide, and video projectors. Student requests for space and equipment are done through the Student Center. Reservations are preferred by fax (270-7471) or online submission: classrooms.downstate.edu.
- Self-service photocopiers or scanners are available on all floors of the library. Copies for a fee may be made if a print services card is used. Fee-based photocopying services are also available (see Access Services desk for details).
- Printing is available via networked printers located on all floors of the library and also in the ALRC.

For more information please go to the library's website at: library.downstate.edu.

## STUDENT COMPUTING

### Teaching Labs

The Health Science Education Building houses the following teaching labs:

6th floor labs - 200 computers distributed through the 8 teaching labs (24 per lab) are used for computerized examinations and virtual microscopy, and are available for individual student use.

5th floor labs - each carrel has an Ethernet port to enable students to use their laptops for virtual microscopy and other high-bandwidth applications.

5th and 6th floor labs - all labs have a computer connected to a smart board, as well as a projector for use by faculty and students within the lab. There are two access points in each room with additional access points strategically located on the floors that provide wireless access at high speed ("N").

### Laptop Requirement

Medical students are required to have a personal laptop meeting the specifications listed at [sls.downstate.edu/mydownstate](http://sls.downstate.edu/mydownstate) (under the computer help section) for use in the second year. This requirement is expected to change to more mobile devices over time.

### MyDownstate (Educational and other Academic Software)

Access to the main applications used by students can be found on the MyDownstate page located at [sls.downstate.edu/mydownstate/](http://sls.downstate.edu/mydownstate/).

The main applications accessible through MyDownstate are:

*Prime* - This Learning Management System is used at SUNY Downstate to put educational materials and activities online. Most courses/blocks use Prime to make documents available for download, host Discussion Forums, upload student submissions into DropBoxes, and host computerized exams.

*New Innovations* - Software used for clinical evaluations and capture of student experience related to patient encounters, used primarily in the third and fourth years of medical education.

*Banner Student Information System* - Students can register online for upcoming courses, view final course grades, and update their personal information inside Banner.

MyDownstate also includes links to other software and information resources available to students.

More detailed information about other resources and assistance can be found in the Student Computing section of the *Student Handbook*.

# University Services

Current and more detailed information appears annually in the *Student Handbook*.

## **BANKING**

Automated teller machine (ATM) services from JP Morgan/Chase are located in the main lobby of the Basic Sciences Building, near the 450 Clarkson Avenue entrance. A customer-service window adjacent to the ATMs is open Wednesdays, 10 am-3 pm (day and time are subject to change). Students are eligible for free checking during their first year, with no minimum balance requirement.

## **BOOKSTORE**

The University Bookstore, operated by the Faculty Student Association, is located on the main level of the Student Center. It carries books, stamps, office supplies, clothing, and novelty items. Hours: 9:30 am-5 pm on Tuesday, Wednesday, and Friday, and 9:30 am-6 pm on Monday and Thursday. For more information, call 718-270-2486 or go to [www.downstate.edu/bookstore](http://www.downstate.edu/bookstore).

## **BURSAR'S OFFICE**

Cashier's window hours:  
10 am-4 pm, Monday, Tuesday, Thursday, and Friday

10 am-5:30 pm Wednesday

The Bursar's Office is responsible for reporting and dispersing to the state comptroller all monies received at SUNY Downstate, except hospital patient receipts. These collections include tuition, dormitory rents, registration deposits, library fines and fees, and dormitory damage fees. The office also disperses all checks made available through all federal loan and scholarship programs, state scholarships and TAP awards, local Center loans and scholarships, and guaranteed loans.

The Bursar's Office accepts Visa, MasterCard, and the Discover cards for payment of tuition, fees, and dormitory-rent charges. The deadline for registration and tuition payment

(to avoid late charges) is generally the last business day before the first day of classes in that semester.

Returning or continuing students who wish to change their out-of-state residency status to in-state residency for tuition purposes must file the appropriate application and supporting documentation with the Registrar's Office two weeks prior to the mailing of the subsequent semester's registration packet (approximately one month prior to the start of the semester). Therefore, change of status from out-of-state to in-state must be initiated six weeks prior to the date of registration for the next term. Registration dates are indicated on the academic calendars.

## **CHAPLAIN SERVICES**

The Office of Pastoral Care of University Hospital of Brooklyn offers religious and other support services to patients, families, staff, and members of the Downstate community. The Interfaith Chapel (Room A1-347, University Hospital) is open 24 hours a day for use by all. Times and dates of religious services are posted on the chapel bulletin board. For more information, call (718) 270-2594; in an emergency, (718) 270-2121.

## **CHILDREN'S CENTER**

Located at 440 Lenox Road, this is an on-site day-care center that offers developmentally appropriate early-childhood education for children from age eight weeks to five years. Its director and staff are fully qualified to teach young children. The Children's Center has a sliding fee scale, and there is a \$20 non-refundable application fee. Center hours are 7:30 a.m. to 5:30 p.m. For more information call the Children's Center, (718) 221-6165.

## **FACULTY-STUDENT ASSOCIATION**

The Faculty Student Association (FSA) provides many student services as well as business and accounting services to campus members. It is an independent, not-for-profit IRS 501(c)(3) corporation with a board of directors comprised of administrative, faculty, and student representatives. FSA administers all

Student Activity Fee finances and Student Health Insurance. It operates the University Bookstore, Hospital Gift Shop, ATM Banking, Café 101, and vending and laundry machines. Go to: [www.downstate.edu/FSA](http://www.downstate.edu/FSA).

FSA has partnered with Zipcar to provide car rentals. Two Zipcars are available in the State Garage at discounted rates. Go to: [www.downstate.edu/zipcar](http://www.downstate.edu/zipcar).

## **FOOD SERVICES**

A cafeteria, open to students, faculty, staff, and visitors, is located on the first floor, between the Basic Sciences Building and University Hospital.

The Faculty Student Association oversees Cafe 101, a catering facility located in Room 2-20 of the Student Center. Cafe 101 offers a special catering menu for student club-funded events. Go to: [www.downstate.edu/cafe101](http://www.downstate.edu/cafe101).

## **OFFICE OF DIVERSITY AND INCLUSION**

The Office of Diversity and Inclusion ensures compliance with federal and state nondiscrimination laws and regulations:

- Title VI and VII of the U.S. Civil Rights Act of 1964 as amended. Prohibits discrimination on the basis of race, color, or national origin in admissions, access to courses of programs, and student policies.
- Title IX of the U.S. Educational Amendments of 1972. Prohibits exclusion from participation in, or denial of benefits, or subjection to discrimination on the basis of sex in any education program or activity receiving federal financial assistance.
- Section 504 of the Vocational Rehabilitation Act of 1973. Prohibits discrimination on the basis of physical or mental handicap in any federally assisted program or activity.
- Age Discrimination Act of 1975. Prohibits discrimination on the basis of age in programs or activities receiving federal financial assistance.

- Americans with Disabilities Act of 1990 (Titles II-V) including Amendment Act of 2008. Prohibits discrimination on the basis of disability in public service and public transportation, public accommodations, telecommunications, and miscellaneous provisions.
- New York State Human Rights Law. Prohibits discrimination by educational institutions, based on age, race, national origin, gender, sexual orientation, marital status, disability, and military status.

Students have the right to consult with the Office of Diversity and Inclusion if they believe they have been subjected to discriminatory treatment or behavior. For more information on how to file a complaint of discrimination, contact Chief Diversity Officer Kevin Antoine, JD, (718) 270-1738 or 3058, or go to: [www.downstate.edu/diversity](http://www.downstate.edu/diversity)

### OFFICE OF STUDENT AFFAIRS

The Office of Student Affairs serves as a general help and information office to students in all five schools. Student health-insurance information, international students' immigration forms, and Commencement are only a few of the areas handled through this office. More information is in the *Student Handbook* and on the institutional website.

### International Student Services

Assistance is provided only for immigration forms, and only for matriculated F-1 students. J-1 students are assisted in the Department of Human Resources. Additional information is in the *Student Handbook*.

### OFFICE OF THE REGISTRAR

The office is responsible for class schedules, registration, course selection, course adds/drops, grades, transcripts, certification of student status, certification of academic good standing, loan deferments, veterans' affairs, and the maintenance of all academic records. Current information and more detailed information is available on the institutional website ([www.downstate.edu](http://www.downstate.edu)) and in the *Student Handbook*.

Current students may review their academic folders by requesting to do so and providing proper identification. It is usually possible to review the folder immediately upon request; however, it may be necessary to make an appointment and return the following day.

Progress reports of academic performance (grades) are available online to students in the School of Graduate Studies and the School of Public Health approximately four weeks after the end of each semester of attendance. Progress reports are available online to students in the College of Medicine at the end of the academic year.

Allow a minimum of two weeks for processing when requesting transcripts, completion of licensure forms, and certification. Overnight or express mail is available at student expense. Arrangements for an overnight mail envelope and prepayment of associated charges may be made through the Bursar's Office and SUNY Downstate Medical Center's mailroom.

Changes in local mailing address, including phone number, must be made online. Changes in permanent address must be reported promptly to the Office of the Registrar.

### PARKING

#### State University Garage Lenox Road between 34th and 35th Streets

Since parking at SUNY Downstate is limited, it has been divided as fairly as possible among faculty, staff, students, and visitors. Reserved parking privileges are available for handicapped individuals.

#### Temporary Parking

Students with a valid ID may park in the State Garage on Monday–Friday from 2:30 pm–5:30 am and all day on weekends and holidays.

Cost: \$1 for the first 12 hours and \$1/hr or any part thereafter.

Cost without a valid ID: \$3/hour or any part thereafter.

For additional information, contact the Parking Office at 825 New York Avenue, 1st floor, Monday–Friday, 9 am–4 pm, 718–270–3163.

### Parking Lot

Located at 404 Winthrop Street between Nostrand and New York Avenues, the parking lot is a non-state facility owned and operated by the HSCB Foundation, Inc. Parking privileges are available to SUNY Downstate employees and students who place their names on the waiting list in the Faculty Student Association Office located in the Student Center, Room 2-09, (718) 270-3187.

The parking lot is open Monday– Friday from 6 am–10 pm. It is closed on Saturdays, Sundays, and holidays. A limited number of transient parking spaces are available at a daily rate. Go to: [www.downstate.edu/fsa/parking.html](http://www.downstate.edu/fsa/parking.html)

### RESIDENTIAL LIFE AND SERVICES

Upon acceptance to SUNY Downstate, students are sent housing information and application forms by the Office of Admissions. For additional information concerning housing, write or telephone: Residential Life and Services  
SUNY Downstate Medical Center  
811 New York Avenue  
Brooklyn, NY 11203  
Telephone: (718) 270-1466  
Fax: (718) 270-1467  
[sls.downstate.edu/residential\\_life](mailto:sls.downstate.edu/residential_life)  
Email: [residentiallife@downstate.edu](mailto:residentiallife@downstate.edu)

A residence hall is a continually changing environment in which resident students can explore the varied relationships and lifestyles in the process of their development as well-rounded individuals. The residence hall is a place where students live, learn, and relax in an environment that emphasizes both individual freedom and community responsibility. Downstate's Residence Life Program is designed to enhance these experiences.

Two residence halls, located at 811 and 825 New York Avenue, accommodate approximately 400 students. Assignments for the academic year are made each summer on the basis of computerized lotteries. Students may upgrade their assignment as space becomes available during the course of the year. Upgrades are decided based on availability.

### **Residence Hall Rooms**

Offered as a single or double occupancy. Each residence hall room contains a bed, desk, dresser, closet and lamp for each occupant. Toilet facilities are shared with students in the adjoining room. Community shower rooms are provided for the occupants of the floor. Community kitchens are provided for residence hall occupants in various locations.

### **Studio Apartments**

Offered as a single or double occupancy as well as for married couples and domestic partners. Each studio apartment contains a bed, desk, dresser, and closet for each occupant, plus a standing floor lamp. Each apartment contains a complete compact kitchen and private bathroom.

### **One-Bedroom Apartments**

A unit for two individuals, with a separate bedroom for each student. Each one-bedroom apartment contains a full-size bed, desk, dresser, and closet, plus a standing floor lamp. The apartment also contains a complete compact kitchen unit and private bath. Assignments to one-bedroom apartments are based on a lottery held for all Downstate students.

### **Off-Campus Housing**

The Off-Campus Housing Office provides interested students with information on available housing options outside of the residence halls. An off-campus housing list is maintained by the Housing Office as a service to Downstate students and staff.

Downstate employees do not inspect, approve or supervise any off-campus premises. Downstate does not become a party to any private landlord-tenant matters.

## **UNIVERSITY POLICE**

The University Police Department maintains a proactive approach to reduction and suppression of crime on campus. More detailed information is published annually by University Police and in the *Student Handbook*.

Officers are assigned to:

- Entrances in each building
- Patrol each building
- Booths that are located in areas of high pedestrian traffic
- Radio-equipped motor vehicles

### **Identification/Facility Access**

There are systems in place that are designed to ensure that persons entering Downstate are authorized to do so. I.D. must be worn on campus.

### **Phones/Alarms**

A network of emergency (red) telephones is located throughout Downstate. In addition, a network of panic alarms is located in various places, including the corridors, laboratories, rest rooms, and on-call rooms. Both the red phones and panic alarms are linked directly with the University Police Department and are monitored 24 hours a day to ensure a quick response to any emergency.

### **Shuttle Service**

To enable personnel who commute by public transportation to get to their points of departure safely, the University Police Department provides transportation to subway stations and bus stops. There is also a shuttle service to and from the off-campus parking facilities and Downstate. Call 718-270-2626 to request these services.

### **Escort Service**

An unscheduled service designed to bring faculty, staff, and students to local destinations at off-peak hours. Call 718-270-2626 to request this service.

### **Closed Circuit Television System**

A CCTV system monitoring the interior and exterior of the Downstate campus is recorded 24 hours a day by the University Police Department.

### **Perimeter Lighting**

Additional high-intensity lighting has been installed on exterior areas of the campus in addition to that already provided by the City of New York.

### **Student Responsibilities**

Isolation can occur almost anywhere on campus, depending on the time of day, day of the week, or specific building.

To avoid isolation, students should:

- Walk and travel in groups, when possible
- Use University Police escort and shuttle services
- Be aware that University Police monitors its telephone switchboard (x2626) 24 hours a day, and that red telephones have direct contact with University Police without dialing
- Be aware that University Police has emergency alarm buttons throughout University Hospital, the Basic Sciences Building, the Health Science Education Building, the Student Center, and dormitories which, if activated, University Police staff are dispatched to investigate.

### **Residence Hall Security**

Downstate has two residential buildings available for students. The following security and safety systems are currently in place:

- 24-hour coverage by University Police officers at 811 New York Avenue.
- Service-desk coverage by professional and student staff (8:30 am-10 pm).
- Electronically locked entrance doors. I.D. cards are swiped for access.
- A panic alarm system on each floor (common areas) and in all public basement areas
- Surveillance cameras in common areas, laundry rooms, and outside entrances.

### **University Police Annual Report**

The Downstate Medical Center University Police/Public Safety Department prepares and publishes an annual security report that complies with the Crime Awareness on Campus Security Act, better known as the Clery Act. This report is available on line at [www.downstate.edu/police/report.html](http://www.downstate.edu/police/report.html). Printed copies are available upon request from University Police Administrative Office, 450 Clarkson Ave, Box 1201, Brooklyn, NY 11203 or call 718-270-3161.



# Faculty Alphabetical Listing

SUNY Downstate has attempted to verify the accuracy of the following faculty information, as of Fall 2015.

- Abaeva, Irina S., PhD**, Research Instructor of Cell Biology  
(Degree: *Lomonosov Moscow State University*)
- Abdallah, Marie, MD**, Clinical Assistant Professor of Medicine  
(Degree: *Lebanese University*)
- Abdelmalek, Ehab E., MD, PhD**, Clinical Assistant Professor of Obstetrics and Gynecology  
(Degree: *Yeshiva University*)
- Abdel-Wahab, Na, MD**, Clinical Assistant Professor of Psychiatry  
(Degree: *Eastern Virginia Medical School*)
- Abrams, Charles K., MD, PhD**, Associate Professor of Neurology and Physiology And Pharmacology  
(Degree: *Yeshiva University*)
- Abrigo, Lourdes, MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *University of Santo Tomas*)
- Abulafia, Ovadia, MD**, Professor and Chairman of Obstetrics and Gynecology  
(Degree: *Tel Aviv University*)
- Adebisi, Akinol, MD**, Clinical Assistant Professor of Psychiatry  
(Degree: *University of Ibadan*)
- Adeyemo, Ishola S., MD** Clinical Assistant Professor of Obstetrics and Gynecology  
(Degree: *University of Jos*)
- Adler, Andrew, MD**, Associate Professor  
(Degree: *SUNY Health Science Center at Brooklyn*)
- Adler, Esther H., MD**, Clinical Assistant Professor of Pathology  
(Degree: *Yeshiva University*)
- Agarwal, Sanjeev, MD**, Assistant Professor of Orthopedic Surgery and Rehabilitation Medicine  
(Degree: *Chhatrapati Shahu Ji Maharaj University*)
- Agoritsas, Konstantinos, MD**, Clinical Assistant Professor of Emergency Medicine  
(Degree: *SUNY Downstate Medical Center*)
- Aherne, Andrew, MD**, Clinical Assistant Professor of Emergency Medicine  
(Degree: *SUNY at Stony Brook*)
- Ahmad, Asma, MD**, Assistant Professor of Pediatrics
- Ahmadi, Ramin, MD**, Clinical Assistant Professor of Obstetrics and Gynecology  
(Degree: *SUNY Downstate Medical Center*)
- Ajayi, Olusegun, MD**, Clinical Assistant Professor of Obstetrics/Gynecology  
(Degree: *University of Ibadan*)
- Akivis, Alla, MD**, Clinical Assistant Professor of Family Practice  
(Degree: *Russian State Medical University*)
- Al-Adhamy, Nabil, MBCHB**, Clinical Assistant Professor of Medicine  
(Degree: *University of Baghdad*)
- Al-Ajam, Mohammad R., MD**, Clinical Assistant Professor of Medicine
- Alapati, Usha, MD**, Assistant Professor of Dermatology  
(Degree: *University of Health Science, Guntur, India*)
- Alarcon, Juan M., PhD**, Assistant Professor of Pathology  
(Degree: *Universidad De Chile*)
- Alexander, Robert G., PhD**, Research Assistant Professor of Ophthalmology  
(Degree: *SUNY at Stony Brook*)
- Alexeenko, Lada, MD**, Clinical Instructor of Psychiatry  
(Degree: *Novosibirsk State University*)
- Alexis, Georgette, MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *Faculty of Medicine and Pharmacy of Haiti*)
- Alfonso, Antonio, MD**, Distinguished Teaching Professor and Chair of Surgery  
(Degree: *University of The Philippines*)
- Allen, Edward, MD**, Clinical Assistant Professor of Family Practice  
(Degree: *SUNY Health Science Center at Brooklyn*)
- Altura, Burton M., PhD**, Professor of Physiology and Pharmacology  
(Degree: *New York University*)
- Amalanathan, Judy, MBBS**, Clinical Assistant Professor of Medicine  
(Degree: *Tanjore Medical College*)
- Amanbekova, Dinara M., MD**, Clinical Instructor of Psychiatry  
(Degree: *Krygys-American School*)
- Amend, James A., MD**, Clinical Assistant Professor of Radiology  
(Degree: *University of Notre Dame*)
- Amendolia, Lisa, MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *SUNY Downstate Medical Center*)
- Amin, Azad, MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *Dhaka University*)
- Amin, Shweta, BCh**, Clinical Assistant Professor of Psychiatry  
(Degree: *University of Mumbai [Bombay]*)
- Amodio, John B., MD**, Professor of Radiology  
(Degree: *New York Medical College*)
- An, Charlene, MD**, Assistant Professor of Emergency Medicine  
(Degree: *University of Michigan - Ann Arbor*)
- Ananthamoorthy, Renuka, MD**, Clinical Assistant Professor of Psychiatry  
(Degree: *University of Pakistan*)
- Anderson, Virginia M., MD**, Associate Professor of Pathology  
(Degree: *Medical University of South Carolina*)
- Anglade, Albert A., MD**, Clinical Assistant Professor of Family Practice  
(Degree: *Universite Detat Dhaiti [State University of Haiti]*)
- Angus, Lambros, MD**, Assistant Professor of Surgery  
(Degree: *Albert Einstein University*)
- Anjum, Fatima, BCh**, Clinical Assistant Instructor of Medicine  
(Degree: *University of the Punjab*)
- Anziska, Brian J., MD**, Associate Professor of Neurology  
(Degree: *University of Capetown*)
- Anziska, Yaacov, MD**, Assistant Professor of Neurology  
(Degree: *SUNY Downstate Medical Center*)
- Apfel, Stuart C., MD**, Assistant Professor of Neurology
- Apostol, Alexandru, MD**, Clinical Associate Professor of Anesthesiology  
(Degree: *University of Bucharest*)
- Aranda, Jacob V., MD**, Professor of Pediatrics  
(Degree: *McGill University*)
- Arbenz, Erick J., MD**, Clinical Assistant Professor of Anesthesiology
- Arica, Koray E., MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *SUNY Downstate Medical Center*)
- Arquilla, Bonnie, DO**, Associate Professor of Emergency Medicine  
(Degree: *NY College for Osteopathic Medicine*)
- Asfar, Tom Richa, MD**, Clinical Assistant Professor Psychiatry  
(Degree: *Hanemann University*)
- Asoma, Kichiemon, MD**, Clinical Assistant Professor of Ophthalmology  
(Degree: *SUNY Downstate Medical Center*)
- Augenbraun, Michael, MD**, Professor of Medicine  
(Degree: *University of Rochester*)
- Axiotis, Constantine A., MD**, Professor of Pathology  
(Degree: *University of Athens*)
- Aytaman, Ayse, MD**, Clinical Associate Professor of Medicine  
(Degree: *University of Vienna*)
- Babinska, Anna, PhD**, Research Associate Professor of Medicine  
(Degree: *University of Lodz*)
- Badero, Oluyemi, MBBS**, Clinical Assistant Professor of Medicine  
(Degree: *University of Ife*)
- Bailey, Shelley, MD**, Assistant Professor of Pediatrics
- Baird, Alison E., MD, PhD**, Professor of Neurology and Physiology and Pharmacology  
(Degree: *University of Melbourne*)
- Balogun, Lola, MD**, Clinical Assistant Professor of Anesthesiology  
(Degree: *SUNY Upstate Medical University*)

**Balucani, Clotilde, MD**, Research Instructor of Neurology  
(Degree: *University of Padua*)

**Bambola, Oluwatoyin, MD**, Associate Professor of Pediatrics  
(Degree: *University of Nigeria*)

**Banerji, Mary A., MD**, Professor of Medicine  
(Degree: *Temple University*)

**Bankole, Olusegum, MBBS**, Clinical Assistant Professor of Medicine  
(Degree: *University of Lagos*)

**Barbour, Randall L., PhD**, Professor of Pathology  
(Degree: *Syracuse University*)

**Baron, Bonny, MD**, Associate Professor of Emergency Medicine  
(Degree: *SUNY Downstate Medical Center*)

**Barone, Frank C., PhD**, Professor of Neurology and Physiology and Pharmacology  
(Degree: *Syracuse University*)

**Barrett, Chameeka, MD**, Clinical Assistant Professor of Emergency Medicine  
(Degree: *SUNY Downstate Medical Center*)

**Barth, Robert, MD**, Associate Professor Clinical Medicine  
(Degree: *Universita Di Bologna*)

**Bartley, Lorie, MD**, Clinical Assistant Professor of Obstetrics and Gynecology  
(Degree: *SUNY Downstate Medical Center*)

**Bartniczuk, Dorota, MD**, Clinical Assistant Professor of Emergency Medicine  
(Degree: *Medical Academy of Warsaw*)

**Basu, Prithwjit P., MD**, Clinical Assistant Professor of Medicine  
(Degree: *University of Calcutta*)

**Batuman, Olcay, MD**, Professor of Medicine  
(Degree: *Hacettepe University*)

**Baweja, Priyanka, MD**, Clinical Assistant Professor of Psychiatry  
(Degree: *Government College of India*)

**Bayol, Marcel G., MD**, Clinical Assistant Professor of Orthopedic Surgery and Rehabilitation Medicine  
(Degree: *Universite D'etat D'haiti*)

**Beal, Alice, MD**, Clinical Assistant Professor of Medicine  
(Degree: *Tufts University*)

**Beckles, Daniel L., PhD**, Visiting Associate Professor of Surgery  
(Degree: *SUNY Health Science Center at Brooklyn*)

**Beharry, Kay, BS**, Research Assistant Professor of Ophthalmology and Pediatrics  
(Degree: *Concordia University*)

**Bejarano Narbona, R., MD**, Clinical Assistant Professor of Medicine  
(Degree: *Universidad El Rosario Bogata, Columbia*)

**Benabe, Morgana, MD**, Clinical Assistant Professor of Psychiatry  
(Degree: *University of Pennsylvania Medical Center*)

**Bendo, Audree A., MD**, Distinguished Service Professor of Anesthesiology  
(Degree: *Rosalind Franklin University of Medicine*)

**Benker, Karen E., MD**, Clinical Assistant Professor of Family Practice  
(Degree: *University of Southern California*)

**Bentsianov, Boris L., MD**, Clinical Assistant Professor of Otolaryngology  
(Degree: *SUNY Downstate Medical Center*)

**Berger, Julius, MD**, Professor of Surgery  
(Degree: *New York Medical College*)

**Bergold, Peter J., PhD**, Professor of Physiology and Pharmacology  
(Degree: *Cornell University*)

**Berkowitz, Ellen, MD**, Clinical Assistant Professor of Psychiatry  
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# State University of New York

The State University of New York's geographically dispersed campuses bring educational opportunity within commuting distance of virtually all New Yorkers and make up the nation's most diverse system of public higher education.

The State University of New York's 64 campuses are divided into four categories, based on educational mission, the kinds of opportunities available, and degrees offered.

SUNY offers students a wide diversity of educational options: short-term vocational/technical courses, certificate programs, associate degree programs, baccalaureate degree programs, graduate degrees, and postdoctoral studies. SUNY offers access to almost every field of academic or professional study somewhere within the system—some 6,688 degree and certificate programs overall.

Students pursue traditional study in classrooms and laboratories or work from home, at their own pace, through such innovative institutions as the SUNY Learning Network and Empire State College.

SUNY's students are predominantly New York State residents, representing every one of the state's 62 counties. SUNY students also come from every other state in the United States, from four U.S. territories or possessions, and 171 foreign countries.

SUNY enrolls 40 percent of all New York State high-school graduates, and has a total enrollment of nearly 468,000 students.

SUNY students represent the society that surrounds them. More than 21 percent of all students are minorities.

SUNY numbers more than 3 million graduates on its rolls. The majority of SUNY's alumni resides and pursues careers in communities across New York State, contributing to the economic and social vitality of its people.

SUNY is committed to bringing its students the very best and brightest scholars, scientists, artists, and professionals. SUNY campuses boast nationally and internationally recognized figures in all the major disciplines. Their efforts are regularly recognized in numerous prestigious awards and honors.

# State University Campuses

## University Centers

University at Albany  
University at Binghamton  
University at Buffalo  
University at Stony Brook

## University Colleges

College at Brockport  
College at Buffalo  
College at Cortland  
Empire State College  
College at Fredonia  
College at Geneseo  
College at New Paltz  
College at Old Westbury  
College at Oneonta  
College at Oswego  
College at Plattsburgh  
College at Potsdam  
College at Purchase

## Health Science Centers

Health Science Center at Brooklyn (SUNY Downstate)  
Health Science Center at Syracuse  
(Upstate Medical University)  
Health Science Center at Buffalo\*  
Health Science Center at Stony Brook\*

## Colleges of Technology

College of Technology at Alfred  
College of Technology at Canton  
College of Agriculture and Technology at Cobleskill  
College of Technology at Delhi  
College of Technology at Farmingdale  
College of Agriculture and Technology at Morrisville  
Institute of Technology at Utica (SUNYIT)

## Specialized Colleges

College of Environmental Science and Forestry  
Maritime College  
College of Optometry

## Statutory Colleges \*\*

New York State College of Agriculture and Life Sciences  
at Cornell University  
New York State College of Ceramics at Alfred University  
New York State College of Human Ecology at  
Cornell University  
New York State School of Industrial and Labor Relations  
at Cornell University  
New York State College of Veterinary Medicine  
at Cornell University

## Community Colleges

Adirondack Community College at Glens Falls  
Broome Community College at Binghamton  
Cayuga County Community College at Auburn  
Clinton Community College at Plattsburgh  
Columbia-Greene Community College at Hudson  
Corning Community College at Corning  
Dutchess Community College at Poughkeepsie  
Erie Community College at Buffalo, Orchard Park,  
and Williamsville  
Fashion Institute of Technology at New York City  
Finger Lakes Community College at Canandaigua  
Fulton-Montgomery Community College at Johnstown  
Genesee Community College at Batavia  
Herkimer County Community College at Herkimer  
Hudson Valley Community College at Troy  
Jamestown Community College at Jamestown  
Jefferson Community College at Watertown  
Mohawk Valley Community College at Utica  
Monroe Community College at Rochester  
Nassau Community College at Garden City  
Niagara County Community College at Sanborn  
North Country Community College at Saranac Lake  
Onondaga Community College at Syracuse  
Orange County Community College at Middletown  
Rockland Community College at Suffern  
Schenectady County Community College at Schenectady  
Suffolk County Community College at Brentwood,  
Riverhead, and Selden  
Sullivan County Community College at Loch Sheldrake  
Tompkins Cortland Community College at Dryden  
Ulster County Community College at Stone Ridge  
Westchester Community College at Valhalla

## EDUCATIONAL RIGHTS\*

The Family Educational Rights and Privacy Act of 1974 protects the rights of students to inspect and review certain educational records and prohibits the nonconsensual release of personally identifiable information from such records which is not “directory information.” Students currently enrolled at Downstate may object to the release of certain categories of directory information pertaining to them by providing written notification to the Office of the Registrar of their college within 14 days following the first day of classes. The categories of directory information at Downstate are listed in the Student Handbook for more detailed information, see the *Handbook*.

- Name, address, telephone numbers, dates of attendance
- Previous institutions, major field of study, degrees conferred
- Past and present participation in officially recognized activities, student photo, date and place of birth

The failure of any student to object specifically to the release of certain or all categories of directory information within the time indicated is interpreted as approval. Please see policy “Family Education Right and Privacy Act” in the *Student Handbook* for further information.

## EDUCATION LAW

The following applies to students who are unable to attend classes on certain days because of their religious beliefs: Sect. 224-a. (New York State Education Law).

1. No person shall be expelled from or be refused admission as a student to an institution of higher education for the reason that s/he is unable, because of religious beliefs, to register or attend classes or to participate in an examination, study, or work requirement on a particular day or days
2. Any student in an institution of higher education who is unable, because of his or her religious beliefs, to attend classes on a particular day or days shall, because of such absence on the particular day or days, be excused from any examination or any study or work requirements.
3. It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school because of his or her religious beliefs an equivalent opportunity to register for classes or make up an exam-

ination, study, or work requirements which he or she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to the said student such equivalent opportunity.

4. If registration, classes, examinations, study, or work requirements are held on Friday after 4:00 p.m. or on Saturday, similar or makeup classes, examination, study, or work requirements, or opportunity to register shall be made available on other days, where it is possible and practicable to do so. No special fees shall be charged to the student for these classes, examinations, study, or work requirements or registration held on other days.

5. In effectuating the provisions of this section, it shall be the duty of the faculty and the administrative officials of each institution of higher education to exercise the fullest measure of good faith. No adverse or prejudicial effects shall result to any student because of his or her availing himself or herself of the provision of this section.

6. Any student who is aggrieved by the alleged failure of any faculty or administrative officials to comply in good faith with the provisions of this section shall be entitled to maintain an action or proceeding in the supreme court of the country in which such institution of higher education is located for the enforcement of his or her rights under this section.

6-a. It shall be the responsibility of the administrative officials of each institution of higher education to give written notice to students of their rights under this section, informing them that each student who is absent from school, because of his or her religious beliefs, must be given an equivalent opportunity to register for classes or make up any examination, study or work requirements which he or she may have missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to such student such equivalent opportunity.

7. As used in this section, the term “institution of higher education” shall mean any institution of higher education, recognized and approved by the Regents of the University of the State of New York, which provides a course of study leading to the granting of a post-secondary degree or diploma. Such term shall not include any institution which is operated, supervised or controlled by a church or by a religious

denominational organization whose education programs are principally designated for the purpose of training ministers or other religious functionaries or for the purpose of propagating religious doctrines. As used in this section, the term “religious belief” shall mean beliefs associated with any corporation organized and operated exclusively for religious purposes, which is not disqualified for tax exemption under section 501 of the United States Code.

\* See the Student Handbook for a full description of student rights.

SUNY Downstate Medical Center reserves the right to alter the existing rules and regulations, and academic programs, as deemed necessary by the institution. SUNY Downstate Medical Center expressly reserves the right, whenever deemed advisable: (1) to change or modify its schedule of tuition and fees; (2) to withdraw, cancel, or reschedule, or modify any course, program of study, degree or any requirement or policy in connection with the foregoing; and (3) to change or modify any academic or other policy.

Essential changes of information in this Bulletin concerning new academic regulations, policies, or programs will be published in newsletters or other University publications. It is the responsibility of each student to ascertain current information that pertains to the individual’s program, particularly with regard to satisfaction of degree requirements by consultation with the student’s advisor, the student’s program, the office of the student’s dean, the Office of Student Affairs, the Registrar’s Office, and other offices as appropriate. In preparing this Bulletin, every effort has been made to provide pertinent and accurate information; however, SUNY Downstate Medical Center assumes no liability for Bulletin errors or omissions.

The State University of New York Downstate Medical Center does not discriminate on the basis of race, sex, sexual orientation, color, creed, age, national origin, handicap, religion, marital status or status as a disabled veteran or veteran of the Vietnam era in the recruitment and employment of faculty or staff, in the recruitment of students, or the operation of any of its programs and activities, as specified by Federal and State laws or regulations. Applications are encouraged and welcomed from New York State residents, out-of-state students, and from members of underrepresented minority groups. New York State residents receive preference for admission.

# State University of New York Downstate Medical Center

## **SUNY DOWNSTATE MEDICAL CENTER**

450 Clarkson Avenue  
Brooklyn, NY 11203

- College of Medicine
- School of Graduate Studies
- School of Public Health
- College of Health Related Professions
- College of Nursing

## **WEBSITE**

[www.downstate.edu](http://www.downstate.edu)

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### **College of Medicine**

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### **School of Graduate Studies**

(718) 270-2740

[sgadmissions@downstate.edu](mailto:sgadmissions@downstate.edu)

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### **Residential Life and Services**

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\*The Health Science Centers at Buffalo and Stony Brook are operated under the administration of their respective university centers.

\*\*These operate as contract colleges on the campuses of independent universities.

# College of Medicine/School of Graduate Studies Index

## A

Accreditation, 5  
Administration, 4  
Admissions (see College of Medicine; School of Graduate Studies)

## B

Banking, 38  
Bookstore, 38  
Bursar, 38

## C

Chaplain, 38  
Children's Center, 38  
College of Medicine  
    Academic Advisement/Development, 20  
    Academic Program, 12-18  
    Admissions, 8-11  
    Alumni Association/Mentoring, 22  
    Clinical Training Facilities, 19  
    Contacts, 60  
    Course Descriptions, 13-17  
    Deferrals, 10  
    Domains of Competence and Integrated Pathways Curriculum, 12  
    Laptop Requirement, 37  
    MD/MPH Program, 18  
    MD/PhD Program, 10, 18, 25  
    Overview, 5  
    Parents Association, 22  
    Research Opportunities, 18  
    Residency Information and Advisement, 21  
    Support Services, 20-21  
    Transfer Admissions, 11  
Computing, Student, 37

## D

Deferrals (College of Medicine), 10  
Directions to SUNY Downstate, 2  
    By Automobile  
    Parking  
    By Railroad/Subway  
    By Bus  
Diversity and Inclusion, Office of, 38

## E

Education Rights and Education Law, 59

## F

Facilities for Instruction, 36-37  
Faculty, 41-56  
Faculty-Student Association, 38  
Financial Aid (visit [sls.downstate.edu/financial\\_aid/](http://sls.downstate.edu/financial_aid/))  
Food Service, 38

## H

History of SUNY Downstate, 6-7

## L

Library, 36

## M

MD/MPH Program, 18  
MD/PhD Program, 10, 18, 25  
Minority Affairs, Office of, 20  
Mission, 5

## P

Parking, 39

## R

Registrar, 39  
Residency Information and Advisement, 21  
Residential Life, 39

## S

School of Graduate Studies  
    Admissions, 25  
    Contacts, 60  
    Courses, 28-32  
    Non-matriculated Students, 25  
    Overview, 5  
    Programs of Study  
        Overview, 26  
        Biomedical Engineering (Joint Program) 33-35  
        Molecular and Cell Biology, 26  
        Neural and Behavioral Science, 27  
        Transfer Credit, 25  
Shuttle Service, 40  
State University of New York, 57-58  
Student Affairs, Office of, 39  
Student Counseling, 21  
Student Health, 21  
Student Life (see Student Handbook: [sls.downstate.edu/student\\_affairs/handbook.html](http://sls.downstate.edu/student_affairs/handbook.html))  
    Student Center  
    Student Activities

## T

Tuition and Fees  
(visit [sls.downstate.edu/bursar/tuition\\_fees.html](http://sls.downstate.edu/bursar/tuition_fees.html))

## U

University Police, 40  
University Resources, 36-37  
University Services, 38-40

## V

Vision and Values, 5

## W

Web Resources for More Information  
Academic Calendars  
[sls.downstate.edu/registrar/calendars.html](http://sls.downstate.edu/registrar/calendars.html)  
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[sls.downstate.edu/student\\_health/](http://sls.downstate.edu/student_health/)  
Student Counseling  
[sls.downstate.edu/student\\_counseling/](http://sls.downstate.edu/student_counseling/)  
Tuition and Fees  
[sls.downstate.edu/bursar/tuition\\_fees.html](http://sls.downstate.edu/bursar/tuition_fees.html)  
University Police  
[downstate.edu/police/](http://downstate.edu/police/)