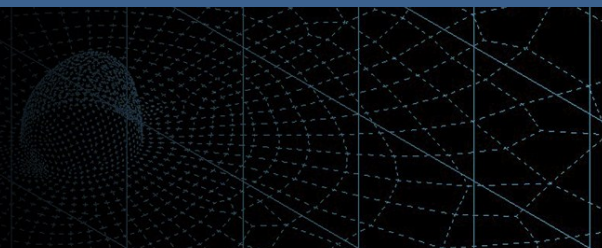


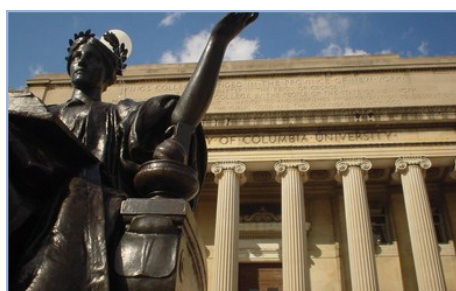


BIOMEDICAL ENGINEERING



GRADUATE STUDENT HANDBOOK

2011-2012 Academic Year



Welcome to Columbia BME!

The evolution of biomedical engineering and the development of a strong knowledge base and principles have shaped the foundation for the academic programs of Columbia University's Department of Biomedical Engineering. Focusing on the areas of biomechanics, cell and tissue engineering, and biomedical imaging, the programs offered by the BME department emphasize the confluence of basic engineering science and applied engineering with the physical and biological sciences.

This handbook contains information about the graduate program, with course and program requirements for both master's and doctoral students. Information about faculty within the department is provided for those students considering research. We have also included an introduction to the graduate student group, GraBME, as well as other BME student groups, so you are aware of the many opportunities that exist for student engagement and you know what exciting events to expect in the upcoming year.

We want your transition to graduate study to be as smooth as possible, and this handbook is meant to help you along the way. Enjoy and welcome to Columbia!

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Interim Department Chair
Andreas H. Hielscher

Department Vice-Chair
Gordana Vunjak-Novakovic

Chair of Graduate Studies Affairs Committee
Helen H. Lu

For more information about the BME program, research laboratories, announcements, departmental events, faculty and student biographies, visit our website at bme.columbia.edu.



Columbia's Graduate Biomedical Engineering Student Group



GraBME was founded to provide a network for students within BME to come together. As a social organization, GraBME focused primarily on enhancing the social and academic lives of students by serving as advocates for student needs in the department.

Today, these same principles are reflected in the two-fold nature of the group. Faculty representatives on the GraBME executive board serve as links between the graduate student body and the faculty, communicating student concerns and ideas. GraBME is also largely involved in departmental functions such as new student recruiting and orientation.

In addition, GraBME hosts a variety of social events throughout the year, including interdepartmental happy hours, barbeques, game and movie nights, holiday

potluck dinners, Dave & Buster's outings, and beach and ski trips. These events aim to bring together students from the different tracks as well as the various engineering disciplines.

GraBME also organizes a number of sports teams for Columbia's intramural athletics, including soccer and volleyball, and we boast the fall 2006 and fall 2007 co-ed football championship teams.

GraBME welcomes all graduate BME students and encourages ideas for social activities as well as any concerns that may be brought to the faculty. For more information, join our facebook group, Columbia GraBME, and keep an eye on our bulletin board outside the department office!

Message from the board

Welcome to the Biomedical Engineering Department! As you start on this exciting journey, GraBME would like to welcome you to the department and invite you to come explore the many activities, research opportunities, and possibilities here.

We understand that this period of transition is exciting yet filled with questions: What courses should I take? How do I choose an advisor? How do I find a research lab?

These questions, and many more, are the focus of this handbook, and we encourage you to contact us if you have any concerns or questions that are not addressed here. Our contact information is located on the bulletin board. You can also find our upcoming events there, and we encourage you to come to our fall kickoff meeting and be more involved in GraBME.

We look forward to meeting you this fall!

*Genevieve Brown, Gwen Effgen, Elise Gill, Venkatesh Hariharan,
Chris Hue, Andrew Kang, Zen Liu*





SOCIETY FOR BIOMATERIALS



The Society for Biomaterials (www.biomaterials.org) is a professional society which promotes advances in biomedical materials research and development by encouragement of cooperative educational programs, clinical applications, and professional standards in the biomaterials field. Biomaterials scientists and engineers study cells, their components, complex tissues and organs and their interactions with natural and synthetic materials and implanted prosthetic devices, as well as develop and characterize the materials used to measure, restore, and improve physiologic function, and enhance survival and quality of life.

The student chapter of the Society for Biomaterials at Columbia University was formed in 2008 with the purpose of enriching the academic experience for students involved in biomaterials-related research. Our chapter's mission focuses on enhancing personal and professional development while also educating the next generation of scientists and engineers through community outreach.

We have organized a number of events to accomplish this mission including:

- Seminars led by representatives from medical device and pharmaceutical companies
- Discussions with distinguished faculty members
- Biomaterials workshops with local middle schools and high schools

In addition, we have begun focusing on planning university-wide events in order to provide more diverse opportunities for graduate BME students and also in-

crease the scope of our events. Most recently, our chapter organized a Biotechnology Networking Social, a campus-wide event with over 100 registered attendees and representatives from several prominent biotechnology companies, including LifeCell and Covidien. The event was highly successful and allowed students to broaden their understanding of scientific opportunities available to graduate degree-holders in industry. Previously, our chapter also hosted the 2010 Northeast Biomaterials Day as part of the 2010 Northeast Bioengineering Conference (NEBEC). This event consisted of a symposium focusing on biomaterials-related research and attracted over 300 faculty and student members from throughout the northeast region. Our chapter is excited to host similar events during the upcoming semesters in order to enhance your experience here at Columbia University!

The Columbia SFB chapter is open to all graduate students in SEAS. Please contact the current president, Siddarth Subramony (sds2156@columbia.edu) or visit our website (www.columbia.edu/cu/sfb/), if you would like more information or are interested in getting involved with the organization.

Siddarth Subramony, President

Nora Khanarian, Vice President

Avital Medelson, Treasurer

Philip Chuang, Secretary

Maggie Boushell, Outreach Chair

Andrea Tan, Public Relations Chair

The EMBS Student Club is part of the IEEE Engineering in Medicine and Biology Society (EMBS) organization and welcomes both undergraduate and graduate students to help plan and participate in our events. Each year we host a number of events that range from field trips to fundraisers.

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A pair of black, textured gloves, likely made of a synthetic material, shown against a white background. The gloves are laid flat, with the fingers spread out. They have a ribbed cuff at the wrist and small, dark, circular details at the tips of the fingers.

COLUMBIA UNIVERSITY
IEEE EMB

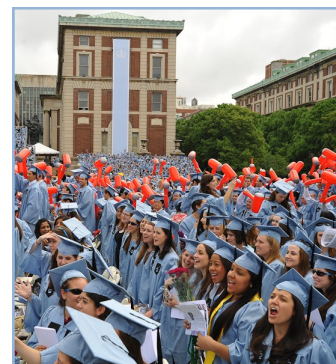
DEGREE REQUIREMENTS

Graduate study in biomedical engineering is designed to enhance one's knowledge in biomechanics, cell and tissue engineering, or biomedical imaging. The confluence of these areas is necessary for the increasingly interdisciplinary nature of the field.

For more detail on graduate programs and courses please visit the department website at bme.columbia.edu/pages/academics/grad/index.html or the Columbia Engineering bulletin at bulletin.engineering.columbia.edu/.

The graduate programs at Columbia (M.S., Ph.D., M.D./Ph.D.) prepare students to apply engineering principles to problems in biology and medicine, improve our understanding of living systems, and develop novel biomedical systems and devices.

The graduate curriculum in biomedical engineering has three main areas of concentration: cell and tissue engineering, biomedical imaging, and biomechanics. There is a strong trend of research at the boundaries of disciplines, with collaboration with specialists from other scientific, medical, and engineering disciplines. Our collaborations with Columbia Medical School and numerous research labs within Columbia, nationwide and abroad, facilitate interdisciplinary research and access to top-of-the-line resources.



Master's Program

Master's candidates are required to complete 30 credits of approved graduate-level course work (4000 level or above), including required courses in quantitative physiology and advanced mathematics.

In consultation with their faculty advisor, master's students select courses appropriate to their career goals, in addition to those needed to fulfill the core requirements. The Master's degree requirements include computational modeling of physiological systems (BMEN 6003), two semesters of BME seminar (BMEN 9700), one graduate level mathematics course (for example, APMA 4001 or APMA 4200), and elective credits.

Elective credits are fulfilled by enrolling in courses offered through the Biomedical Engineering Department, or any other department included in the School of Engineering and Applied Science (SEAS). Laboratory research may also supplement elective credits (more information below). Masters students should select courses appropriate to their career goals. It is recommended the student consult with their respective faculty advisor when considering how to tailor their program. Please see the included track-specific sample curricula as well as www.bme.columbia.edu/pages/academics/grad/masters.html for further details on course requirements.

Master's students interested in pursuing research can choose up to 6 credits (2 semesters) of research under the guidance of a BME faculty member. It is the responsibility of the student to contact individual faculty to find research opportunities. Research can be done for either credit or stipend, but not both simultaneously. If a Master's student is interested in conducting research, it is in their best interest to begin contacting research advisors as early as possible in the semester.

Master's candidates are self-funded and must complete the aforementioned coursework with a minimum GPA of 2.5 to be eligible for degree conferral. After completion of the M.S. degree requirements, students must apply for graduation through the registrar's office. Please see www.columbia.edu/cu/registrar/docs/forms/app-for-deg-or-cert.html for the form.

DEGREE REQUIREMENTS

Master's Leading to Ph.D. Program

Students entering the program without a masters degree must complete all masters requirements before entering the doctoral program. Graduate courses should be selected to prepare the student for the doctoral qualifying examination and include two semesters of *master's* research.

Following completion and successful application for graduation with a master's degree, students are transferred to the Graduate School of Arts and Science (GSAS) to continue with the doctoral program. It is recommended that M.S. diplomas be picked up immediately once they become available, as the transition between schools can affect tuition payments.

Doctoral Program

Doctoral candidates are required to complete a program of 30 credits beyond the M.S. degree, pass an oral and written qualifying examination, propose and defend their doctoral dissertation, which is based on individual research. More details regarding these requirements are discussed in "Doctoral Requirements" on page 8.

At least one graduate level mathematics course must be taken in addition to the course required for the M.S. degree. Remaining courses should be selected in consultation with the student's advisor to prepare for the qualifying exam and develop expertise in an area of biomedical engineering. Up to 12 credits of *doctoral* research may be applied toward the doctoral degree course requirements.



M.D./Ph.D. Program

The Department of Biomedical Engineering is the only engineering department that offers Ph.D. training to M.D./Ph.D. students. These candidates complete their Ph.D. program within 3.5 years, with otherwise the same requirements as all Ph.D. students.

SAMPLE CURRICULA

The following sample curricula for the M.S. degree includes core BME courses as well as electives based on the three major focus areas of the department. (*Denotes BME core courses.)

BIOMECHANICS	CELL AND TISSUE ENGINEERING	BIOMEDICAL IMAGING
Semester I—Fall	Semester I—Fall	Semester I—Fall
BMEN E9700x: <i>Biomedical Engineering Seminar (0 credits)*</i>	BMEN E9700x: <i>Biomedical Engineering Seminar (0 credits)*</i>	BMEN E9700x: <i>Biomedical Engineering Seminar (0 credits)*</i>
BMEN E4001x: <i>Quantitative Physiology I: Cells and Molecules (3 credits)</i>	BMEN E4001x: <i>Quantitative Physiology I: Cells and Molecules (3 credits)</i>	BMEN E4001x: <i>Quantitative Physiology I: Cells and Molecules (3 credits)</i>
MECE E6422x: <i>Introduction to the Theory of Elasticity (3 credits)</i>	BMEN E4501x: <i>Tissue Engineering I: Biomaterials and Scaffold Design (3 credits)</i>	BMEN E4894x: <i>Biomedical Imaging (3 credits)</i>
BMEN E4340x: <i>Biomechanics of Cells (3 credits)</i>	BMEN E6500x: <i>Tissue and Molecular Engineering Laboratory (4 credits)</i>	BMEN E6400x: <i>Analysis and Quantification of Medical Images (3 credits)</i>
BMEN E9100x: <i>Master's Research (3 credits)</i>	BMEN E9100x: <i>Master's Research (2 credits)</i>	BMEN E9100x: <i>Master's Research (3 credits)</i>
Total: 12 credits	Total: 12 credits	Total: 12 credits
Semester II—Spring	Semester II—Spring	Semester II—Spring
BMEN E9700y: <i>Biomedical Engineering Seminar (0 credits)*</i>	BMEN E9700y: <i>Biomedical Engineering Seminar (0 credits)*</i>	BMEN E9700y: <i>Biomedical Engineering Seminar (0 credits)*</i>
BMEN E4002y: <i>Quantitative Physiology II: Organ Systems (3 credits)</i>	BMEN E4002y: <i>Quantitative Physiology II: Organ Systems (3 credits)</i>	BMEN E4002y: <i>Quantitative Physiology II: Organ Systems (3 credits)</i>
BMEN E4300y: <i>Solid Biomechanics (3 credits)</i>	BMEN E4502y: <i>Tissue Engineering II: Biological Tissue Substitutes (3 credits)</i>	BMEN E4410y: <i>Ultrasound in Diagnostic Imaging (3 credits)</i>
APMA E4011y: <i>Principles of Applied Mathematics (3 credits)*</i>	APMA E4011y: <i>Principles of Applied Mathematics (3 credits)*</i>	APMA E4420y: <i>Biomedical Signal Processing and Signal Modeling (3 credits)*</i>
BMEN E9100y: <i>Master's Research (3 credits)</i>	BMEN E9100y: <i>Master's Research (3 credits)</i>	BMEN E9100y: <i>Master's Research (3 credits)</i>
Total: 12 credits	Total: 12 credits	Total: 12 credits
Semester III—Fall	Semester III—Fall	Semester III—Fall
BMEN E6003x: <i>Computational Modeling of Physiological Systems (3 credits)*</i>	BMEN E6003x: <i>Computational Modeling of Physiological Systems (3 credits)*</i>	BMEN E6003x: <i>Computational Modeling of Physiological Systems (3 credits)*</i>
BMEN E4301x: <i>Structure, Mechanics, and Adaptation of Bone (3 credits)</i>	BMEN E6001x: <i>Advanced Scaffold Design and Engineering (3 credits)</i>	APMA E4200x: <i>Partial Differential Equations (3 credits)*</i>
Total: 6 credits	Total: 6 credits	Total: 6 credits

DOCTORAL REQUIREMENTS



Doctoral candidates are expected to complete 30 credits beyond the master's degree, pass an oral and written qualifying examination, and successfully propose and defend their doctoral dissertations, which are based on individual research. In addition, all doctoral students must demonstrate teaching competence as part of their training.

Qualifying Examination

Doctoral candidates are required to pass a qualifying examination. The written examination is given once a year in January. It should be taken after the student has completed 30 credits, but before completing 45 credits of graduate study. A GPA of at least 3.2 is required to take the exam.

Students must declare a track (biomechanics, cell and tissue engineering, or imaging) at the time of registration. The examination consists of a written component and an oral exam. The written exam covers applied mathematics, quantitative physiology, and a track-specific examination.

The oral examination consists of the analysis and preparation of assigned scientific papers in the student's thesis research area.

A candidate who fails any part of the examination may be permitted to repeat it once at the time of the next examination.

Doctoral Committee and Thesis

Each student is expected to submit a research proposal and present it to a thesis committee of at least four faculty members. This committee considers the scope of the proposed research, its suitability for doctoral research and the appropriateness of the research plan.

In accord with regulations of the School of Engineering and Applied Science, each student is expected to submit a thesis and defend it before a committee of five faculty, two of whom hold primary appointments in another department.

Every doctoral candidate is expected to have had accepted at least one full-length paper for publication in a peer-reviewed journal prior to recommendation for award of the degree.

Teaching Assistant Requirements

All doctoral students are required to be a teaching assistant for three semesters in order to demonstrate teaching competence as part of their training. The TA requirement for M.D./Ph.D. candidates is one semester only, due to the extensive clinical duties.

BME FACULTY

The Department of Biomedical Engineering is currently home to 21 full-time faculty. As a result, our department hosts an exceptional range of cutting-edge and world-class research laboratories housed in over 50,000 square feet of space in the Morningside Heights and Health Sciences campuses. Mirroring our graduate curriculum, our research areas are generally associated with three research tracks, among which the faculty are equally divided. However, it is in the overlap between these broad and diverse areas that our true strength lies.

BIOMECHANICS	CELL AND TISSUE ENGINEERING	BIOMEDICAL IMAGING
Gerard A. Ateshian <i>Musculoskeletal Biomechanics Laboratory</i>	Helen H. Lu <i>Biomaterials and Interface Tissue Engineering Laboratory</i>	Andreas H. Hielscher <i>Biophotonics and Optical Radiology Laboratory</i>
Hayden Huang <i>Biomechanics and Mechanotransduction Laboratory</i>	Jeremy J. Mao <i>Tissue Engineering and Regenerative Medicine Laboratory</i>	Elizabeth M. C. Hillman <i>Laboratory for Functional Optical Imaging</i>
Christopher R. Jacobs <i>Cell and Molecular Biomechanics Laboratory</i>	Samuel K. Sia <i>Molecular and Microscale Bioengineering Laboratory</i>	Elisa E. Konofagou <i>Ultrasound and Elasticity Imaging Laboratory</i>
Van C. Mow <i>Liu Ping Laboratory for Functional Tissue Engineering</i>	Edward F. Leonard <i>Artificial Organs Research Laboratory</i>	Paul Sajda <i>Laboratory for Intelligent Imaging and Neural Computing</i>
X. Edward Guo <i>Bone Bioengineering Laboratory</i>	Clark T. Hung <i>Cellular Engineering Laboratory</i>	Andrew F. Laine <i>Heffner Biomedical Imaging Laboratory</i>
Henry Hess <i>Molecular Engineering Laboratory</i>	Lance C. Kam <i>Microscale Biocomplexity Laboratory</i>	
Elizabeth S. Olson <i>Fowler Memorial Laboratory</i>	Barclay Morrison, III <i>Neurotrama and Repair Laboratory</i>	
	Kenneth L. Shepard <i>Bioelectronic Systems Laboratory</i>	

BME FACULTY

Where these fields intersect, we have established particular expertise and resources dedicated to a growing number of research fields.

Cardiac research

Cardiac biomechanics, cardiac tissue engineering and state-of-the-art in vivo cardiac imaging

Neuroengineering

Computational modeling of neural systems, in vivo clinical and pre-clinical neuroimaging, neurotrauma and repair research, neuronal tissue engineering

Stem cell research

Functional tissue engineering and regenerative medicine research using stem cells

Microscale engineering and nanotechnology

Cell positioning and molecular design, MEMs and lab-on-a-chip diagnostic devices, micro- and nano-fabrication techniques combined with advanced microscopy

Orthopedics research

Musculoskeletal biomechanics, cellular and molecular bone biomechanics, bone and tissue interface tissue engineering, in vivo imaging of osteoarthritis



BME FACULTY

The Department of Biomedical Engineering has two adjunct faculty and numerous affiliates and collaborators. Some of the faculty even hold joint appointments in other departments within the engineering and medical schools. These affiliations contribute to the multi-disciplinary nature of biomedical engineering research here at Columbia and represent a strength of our program.

For more information about faculty in the department, please visit bme.columbia.edu/directory/faculty.

Aaron Matthew Kyle

Lecturer in Biomedical Engineering

Nicolas W. Chbat

*Adjunct Associate Professor of
Biomedical Engineering*

Philips Research North America

Ernest J. Feleppa

*Adjunct Professor of
Biomedical Engineering*

Riverside Research Institute

Many BME faculty hold appointments in other departments. Gerard Ateshian is also a Professor and Department Chair of Mechanical Engineering. Andreas H. Hielscher, Elisa E. Konofagou, Andrew F. Laine, and Paul Sajda also hold appointments in Radiology. Edward F. Leonard is also a Professor of Chemical Engineering, and Kenneth L. Shepard is also a Professor of Electrical Engineering. Helen H. Lu holds an appointment in Dental and Craniofacial Bioengineering, and Van C. Mow is also a Professor of Orthopedic Bioengineering. Lastly, Elizabeth S. Olson holds another appointment in Auditory Biophysics in the Department of Otolaryngology/Head and Neck Surgery at the College of Physicians and Surgeons.

STAFF

Shila Maghji

Department Administrator

Jarmaine Lomax

*Administrative Assistant for
Student Affairs*

Robert J. Foster

*Associate Research Scientist
Computer Systems Administrator*

Michelle Cintron

Financial Assistant

Paulette Louissaint

*Administrative Assistant to
the Chair*

Keith Yeager

*Senior Staff Associate
Laboratory Manager*

Kidest Shenkoru

Business Manager

IMPORTANT DATES

August 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

BME ORIENTATION
ORIENTATION PARTY!

September 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
	FIRST DAY OF CLASSES					
4	5	6	7	8	9	10
11	12	13	14	15	16	17
		FALL SEMESTER FEES DUE				
18	19	20	21	22	23	24
25	26	27	28	29	30	

GRABME EVENT AT
HARLEM LANES

STUDENT SERVICES

We have included some pertinent information regarding registration, medical insurance, and gym memberships here. More comprehensive information about student services can be found at www.columbia.edu/cu/studentservices/welcome/.

Registration

Registration for courses can only be completed during the assigned registration appointments found on SSOL (ssol.columbia.edu).

All doctoral students must be registered full time (≥ 12 credits) every semester while at Columbia. If you are not taking enough course-work credits to be considered a full-time student, you must also register for a residence unit each semester to maintain full-time status, after which you will register for extended residence units until you graduate.

Health Services

All incoming students are required to meet the NY state public health immunization requirements before registration: documentation of immunity to measles, mumps, and rubella (MMR) and a decision regarding the meningococcal meningitis vaccination.

The Primary Care Medical Services (PCMS) at Columbia provides comprehensive care for routine, urgent, and chronic needs. Additionally, PCMS provides sexual health, reproductive and gynecological services, travel medicine, LGBTQ health care, immunizations, and referrals.

There are two health insurance plans available to all students: *basic* or *comprehensive* (please refer to the Columbia Student Health brochure for details). Students who fail to sign up will be automatically enrolled in the basic plan.

The basic plan is fully covered by the department for Ph.D. students enrolled in the program. Students may choose to enroll in the comprehensive plan by paying the difference of the two plans.

Students may also request a waiver from Columbia coverage as long as proof of enrollment in an equivalent plan that meets specific coverage criteria is provided.

Dental care is included as a part of the Columbia insurance plan, providing a discounted rate at Morning-side Dental Associates. Dental insurance is available at an additional cost not covered by the department for a primary care dentist within the tri-state area.

For further details, please visit health.columbia.edu/.

Gym and Athletics

The Dodge Fitness Center is the most comprehensive wellness facility on the Upper West Side. The Fitness and Recreation Facilities include an indoor running track, 25-yard pool, Scandinavian Sauna, multi-sport gymnasium, and a tri-level fitness center with the latest cardiovascular and strength training equipment. Additionally, a number of instructional classes are offered including yoga, kickboxing, kayaking, and squash. For a more personal approach, there is a qualified staff of personal trainers that can tailor an individualized program to suit your needs. Finally, in addition to the teams GraBME organizes, the extensive intramural league and clubs offer over 45 different sports.

Basic access membership fees are automatically added to your student bill each semester. Towel and locker rentals are also available at an additional fee. Further details can be found at www.gocolumbiaions.com/ViewArticle.dbml?DB_OEM_ID=9600&ATCLID=319176.



TUITION BILL

...some notes regarding the fees for which you are responsible

All students are responsible for the following fees:

1. *Transcript fee (one time only, \$95.00)*
2. *Facilities fees (three times per year, ~\$390.00)*
3. *Student activity fee (\$25.00 per semester)*

Doctoral students are automatically enrolled in the Basic healthcare plan, but may upgrade to the Comprehensive plan at half the cost. Students who wish to do this should contact Dean Tiffany Simon (tms26@columbia.edu).

There is also an *initial tuition deposit of \$500* that can be waived by M.S. leading to Ph.D. and Ph.D. students by submitting a copy of your department funding letter. Master's students are responsible for this initial deposit, but will be reimbursed once the semester begins.

Master's only students are also responsible for:

1. *Medical insurance (Basic plan—\$1,935.00 annual premium, Comprehensive plan—\$2,816.00 annual premium)*
2. *Graduate engineering tuition (\$1480.00/credit)*

Healthcare for Master's students is optional—if students do not elect coverage there is no fee outside of Health Services.

International students must also pay an *international student fee (\$50.00 per semester)*.

These fees should be viewable on your student account detail through SSOL, and an electronic bill will be sent to you by the office of Student Financial Services. *You are responsible for paying the previously mentioned fees by the deadline indicated on the Student Financial Services website, which is currently September 15, 2011.* If these fees are not paid on time, you will be responsible for late fees. Doctoral students are not responsible for late fees on their tuition.

...some helpful tips

Taking care of your student bill can feel like a hassle, so we have some practical information to help you get through this process as painlessly as possible. This is particularly useful for Master's students managing student loans.

- Everything but tuition should be paid for by the requisite date.
- Federal loans often come in faster than private loans, so these should be used to pay any fees outside of tuition as soon as possible.
- Private loans may come in post-deadline, but you should be able to get late fees waived once your bill has been settled by contacting your financial advisor in the Educational Financing office (see Student Account Servicing on the following page for more information).

STUDENT ACCOUNT SERVICING

There are two offices at the university that contribute to managing your student account.

Undergraduate Financial Aid and Educational Financing

Lerner Hall 6th Floor West
(212) 854-3711

The Educational Financing office is not just for undergraduate students—every student is assigned a financial advisor. This office handles the engineering school. Your financial advisor can determine whether you qualify for federal aid and serves as a liaison when receiving and approving loan requests based on the school's calculated cost of attendance. *If this office does not confirm your loan, the payment will never be posted to your student account!* Each student in need of help with their student account should seek their personal financial advisor as soon as possible. Advisors will not recommend private lenders, as they are not allowed to give financial advice, but will communicate with lenders once you designate one.

Student Financial Services

205 Kent Hall
(212) 854-4400

Mailing Address:
205 Kent Hall, Mail Code 9202
1140 Amsterdam Avenue
New York, NY 10027

This office handles billing, and any payments made on your student account should be made to this office. The cashier's office will collect funds to pay your account and then process any remaining funds as a refund. This can go directly to your checking account if you elect to participate in the Automatic Refund Process. If you are paying your tuition and fees 100% out-of-pocket, you should go to this office to pay the debt on your student account. As previously mentioned, the Educational Financing office funnels loan requests and cost of attendance approvals to Student Financial Services. Once approved by Student Financial Services, the confirmation will go back to Educational Financing to complete the processing, but eventually all funds arrive at Student Financial Services.

All students should visit this office to pay the fees for which they are responsible, or mail their payment. Student Financial Services no longer accepts credit card payments, but fees may be paid using checks or the office's online billing system.

FINANCIAL AID AND FELLOWSHIPS

All Master's to Ph.D., M.D./Ph.D. and Ph.D. students are provided with research assistantships covering a yearly stipend and tuition. Terminal master's students need to cover all their expenses, as there is no mechanism for funding through BME.

Doctoral students are strongly encouraged to apply for external funding such as those awarded by the National Science Foundation (NSF). Students in the department have been successful in obtaining these awards - in 2008, 10% of NSF fellowships awarded to BME students went to BME graduate students. The department provides help with applications for graduate scholarships.

Additional fellowship opportunities are listed on the department website at bme.columbia.edu/pages/academics/grad/financial_aid_fellowships.html.

Graduate School of Arts and Sciences (GSAS) Financial Aid Office

107 Low Library
(212) 854-3809

This office interprets and implements policy regarding GSAS fellowships and student financial aid. The staff administers departmental and outside fellowships, calculates financial aid for both incoming and continuing students. The staff supplies information to students and departments on fellowship and financial aid programs from Columbia and outside sources.

Contacts

TBD, Assistant Dean

Kerry Gluckmann, Director (kag1@columbia.edu)

Tom Tarduogno, Director (tt22@columbia.edu)

USEFUL INFORMATION

A list of contact information for health and safety resources, as well as locations of nearby markets and pharmacies.

Health Services and Emergency Resources

Columbia University Health Services

John Jay Hall, 3rd and 4th Floors

519 West 114th St., Mail Code 3601

General Information: (212) 854-2284

After-hours urgent health concerns: (212) 854-9797

CU-EMS (Ambulance): (212) 854-5555

Rape Crisis/Anti-Violence Support Center:

(212) 854-HELP

Counseling and Psychological Services

Alfred Lerner Hall, 8th Floor

2920 Broadway, Mail Code 2606

Appointments: (212) 854-2878

After-hours clinician-on-call: (212) 854-9797

Additional Emergency Resources

St. Luke's-Roosevelt Hospital

1111 Amsterdam Avenue at 114th Street

General Information: (212) 523-4000

Emergency Room: (212) 523-3335

Psychiatry Emergency Room: (212) 523-3347

Safety

Columbia University Department of Public Safety:

(212) 854-5555

Non-emergency number: (212) 854-2797

26th Police Precinct

520 West 126th Street

(212) 678-1311

Point-to-Point After-Hours Shuttle Service:

(212) 854-SAFE

Grocery Stores

Westside Market

2840 Broadway

(212) 222-3367

D'Agostino's Supermarket

2828 Broadway

(212) 663-9895

Morton Williams Supermarket

2491 Broadway

(212) 666-4190

M²M Korean Grocery

2935 Broadway

(212) 280-4600

Pharmacies

Duane Reade

2864 Broadway

(212) 316-5113

Rite-Aid

2833 Broadway

(212) 663-3135

COLUMBIA BME

With three major BME student groups, as well as numerous clubs throughout the College of Engineering (Engineering Graduate Student Council and GradSWE, to name a couple), there is always something fun to take part in here at Columbia.

We are excited you are here!



2011-2012 Department Statistics

65 Males

46 Females

83 Ph.D. students

28 Master's students

10 Biomechanics

38 Cell and Tissue Engineering

36 Biomedical Imaging

27 Undecided



Columbia University in the City of New York



BIOMEDICAL ENGINEERING



Columbia University in the City of New York Department of Biomedical Engineering

351 Engineering Terrace
1210 Amsterdam Avenue
New York, NY 10027