Welcome to the Department of Biology, where research lies at the heart of the Ph.D. experience. We strive to provide our graduates with the technical and intellectual training needed for future success in a wide variety of careers.

Our department is well-equipped for modern molecular, cellular, genomic, proteomic, biochemical, imaging and bioinformatics research. We have core facilities with state-of-the-art instrumentation for fluorescence and high-resolution live-cell imaging and flow cytometry, excellent animal facilities and substantial computational resources. We continue to grow our faculty with new hires who further strengthen our core areas of study: examining fundamental problems in cell and developmental biology, microbiology and infection, and bioinformatics.

The Department of Biology is comprised of a close-knit group of graduate students, faculty, post-docs and researchers who collaborate to produce an atmosphere of congenial learning and discovery. Our robust department life facilitates graduate students’ entry into this community of scholars. The department hosts many activities that create a strong intellectual community and sense of collegiality amongst our students and faculty, including an annual Department of Biology Retreat, Data Club, Cell Biology Group meetings and Microbiology Group meetings.

Our program is committed to thorough training of our students. Incoming Ph.D. students begin their research by conducting three, seven-week rotations in laboratories of their choosing. To enhance students’ communication skills, each rotation concludes with students presenting the research from their rotation projects to the department. Upon completion of three rotations, students enter the laboratories where they will complete their thesis projects.

In addition to research, we aim to develop the communication skills necessary for the pursuit of a variety of potential careers. Most students gain practice in mentoring by working with undergraduate research assistants. Skills in the formal presentation of scientific data are honed at the Departmental Data Club. Our students are integrated into the scientific community by a number of mechanisms. On campus, students have the opportunity to have lunch with leading scientists who present their work in our Departmental Seminar Series. Our program is further enhanced by the opportunities to participate in the Greater Boston area topical research meetings and seminars. Additionally, the Department of Biology provides funding for students to attend and present their research at local, national and international meetings.

The city of Boston boasts a vibrant biomedical sciences research community, providing our students with many opportunities for collaboration and future employment opportunities in both academia and industry. For more information, please visit the Department of Biology website at bc.edu/biology.
PROGRAM OVERVIEW

Our Ph.D. program provides an in-depth training experience. Core course work is provided in cell biology, biochemistry, molecular biology, genetics, bioinformatics and scientific writing. Advanced electives are available in all areas of faculty expertise. Seminar courses provide students with ongoing training in critical thinking and oral presentation of scientific data. Research experience is provided by working in close cooperation with faculty members, postdoctoral fellows and senior students in a collaborative, supportive environment.

Focus on Research

Research lies at the heart of the biology experience at Boston College. The department offers a wide array of opportunities for scientific investigation within the areas of:

- Microbiology and Infection
- Cell and Developmental Biology
- Bioinformatics

For specific areas of research in the department, please refer to our faculty profiles.

GRADUATE FACULTY PROFILES

ANTHONY T. ANNUNZIATO
Professor
Ph.D., University of Massachusetts, Amherst

RESEARCH INTERESTS
Molecular biology, chromatin assembly and histone modifications in human cells and fission yeast

SELECTED PUBLICATIONS

DAVID R. BURGESS
Professor
Ph.D., University of California, Davis

RESEARCH INTERESTS
Cytokinesis and the polarization of the cytoskeleton

SELECTED PUBLICATIONS

THOMAS C. CHILES
Professor, The DeLuca Chair in Biology, Vice Provost for Research
Ph.D., University of Florida

RESEARCH INTERESTS
B lymphocyte growth and survival, metabolomics, nanodiagnostics

SELECTED PUBLICATIONS
**FACULTY PROFILES**

**PETER CLOTE**  
Professor  
Ph.D., Duke University  
Doctorat d’Etat de l’Université Paris VII

**RESEARCH INTERESTS**  
Computational design of RNA molecules, RNA thermodynamics-based algorithms, folding kinetics and network properties of RNA, machine learning in bioinformatics

**SELECTED PUBLICATIONS**  

**ERIC S. FOLKER**  
Assistant Professor  
Ph.D., University of Notre Dame

**RESEARCH INTERESTS**  
Cellular organization, mechanisms of nuclear movement and the role of nuclear movement in muscle development

**SELECTED PUBLICATIONS**  

**MARC-JAN GUBBELS**  
Associate Professor  
Ph.D., Utrecht University, The Netherlands

**RESEARCH INTEREST**  
Genetic and cellular biological basis of Toxoplasma gondii cell division and host cell invasion

**SELECTED PUBLICATIONS**  

**CHARLES HOFFMAN**  
Professor and Graduate Program Director  
Ph.D., Tufts University, The Sackler School

**RESEARCH INTERESTS**  
Cyclic nucleotide signaling, small molecule screening and transcriptional regulation in the fission yeast Schizosaccharomyces pombe

**SELECTED PUBLICATIONS**  

**WELKIN JOHNSON**  
Professor and Department Chairperson  
Ph.D., Tufts University School of Medicine

**RESEARCH INTERESTS**  
Retroviruses, primate lentiviruses, endogenous retroviruses (ERV), virus-host coevolution

**SELECTED PUBLICATIONS**  


**DANIEL KIRSCHNER**

Ph.D., Harvard University

**RESEARCH INTERESTS**

Structural analysis of myelin sheaths, neurodegenerative diseases, peripheral demyelinating neuropathies

**SELECTED PUBLICATIONS**


**LAURA ANNE LOWERY**

Assistant Professor

Ph.D., Massachusetts Institute of Technology

**RESEARCH INTERESTS**

Cytoskeletal dynamics during cell migration, axon outgrowth, development of the nervous system

**SELECTED PUBLICATIONS**

FACULTY PROFILES


JUNONA MOROIANU
Associate Professor
Ph.D., Rockefeller University

RESEARCH INTERESTS
Nuclear import pathways for human papillomavirus (HPV) proteins and genomic DNA

SELECTED PUBLICATIONS

THOMAS N. SEYFRIED
Professor
Ph.D., University of Illinois

RESEARCH INTEREST
Gene-environmental interactions in epilepsy and brain cancer

SELECTED PUBLICATIONS

TIM VAN OPIJNEN
Assistant Professor
Ph.D., University of Amsterdam, The Netherlands

RESEARCH INTERESTS
Microbial systems biology, drug/gene interaction networks and the development of new antimicrobials, the development of genome-wide next generation sequencing strategies to link genotypes to phenotypes, the engineering of bacteria with new traits and novel applicability, microfluidics and antimicrobial discovery

SELECTED PUBLICATIONS

KENNETH C. WILLIAMS
Professor
Ph.D., McGill University

RESEARCH INTERESTS
Central nervous system macrophages, neuroAIDS, AIDS pathogenesis, monocyte/macrophage biology

SELECTED PUBLICATIONS
COURSES

FALL 2017

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>Virus Infections and Cell Transport</td>
<td>Moroianu</td>
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<tr>
<td>Cancer/Metabolic Disease</td>
<td>Seyfried</td>
</tr>
<tr>
<td>Advanced Lab in Cell Imaging</td>
<td>Judson</td>
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<tr>
<td>Advanced Genetics</td>
<td>van Opinjen</td>
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<tr>
<td>Graduate Biochemistry</td>
<td>Folker</td>
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<tr>
<td>Graduate Bioinformatics</td>
<td>Henzy</td>
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<tr>
<td>Literature for Neurological Diseases</td>
<td>Kirschner</td>
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<tr>
<td>Viruses and Evolutionary Theory</td>
<td>Johnson/Henzy</td>
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SPRING 2018

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>Recombinant DNA Technology</td>
<td>Hoffman</td>
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<td>Immunity and Infectious Disease</td>
<td>Williams</td>
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<tr>
<td>Viruses, Genes and Evolution</td>
<td>Johnson</td>
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<tr>
<td>Literature for Neurological Diseases</td>
<td>Kirschner</td>
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<tr>
<td>Genomics and Personalized Medicine</td>
<td>Connolly/Chiles</td>
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<td>DNA Viruses and Cancer</td>
<td>Moroianu</td>
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<td>Graduate Molecular Biology</td>
<td>Annunziato</td>
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<td>Advanced Cell Biology</td>
<td>Lowery</td>
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<td>Scientific Proposal Writing</td>
<td>Gubbels/Williams</td>
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<td>Synthetic Biology</td>
<td>Meyer</td>
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<td>Environmental Disruptors of Development</td>
<td>Hake</td>
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<tr>
<td>Biomolecules</td>
<td>Clote</td>
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<tr>
<td>Cancer/Metabolic Disease</td>
<td>Seyfried</td>
</tr>
<tr>
<td>Advanced Lab in Cell Imaging</td>
<td>Judson</td>
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OUTCOMES

Recent Dissertations

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>Betty Lou Slinger</td>
<td>“Insights into the Co-Evolution of Ribosomal Protein S15 with its Regulatory RNAs”</td>
</tr>
<tr>
<td>Michelle Archibald</td>
<td>“Novel Nanoarchitectures for Electrochemical Biosensing”</td>
</tr>
<tr>
<td>Juan Garcia Martin</td>
<td>“RNA Inverse Folding and Synthetic Design”</td>
</tr>
<tr>
<td>Lauren Meyer</td>
<td>“Meiosis Specific Regulation of Centromere Chromatin and Chromosome Segregation by a Transposase Derived Protein”</td>
</tr>
<tr>
<td>Joshua Walker</td>
<td>“The Role of Monocytes and Macrophages in Pathogenesis of HIV and SIV-Associated Cardiovascular Disease”</td>
</tr>
<tr>
<td>Shermin Pei</td>
<td>“Identification of Functional RNA Structures in Sequence Data”</td>
</tr>
<tr>
<td>Shannon Heyse Argueta</td>
<td>“The nutrients L-glutamine and Glucose Have Unique Roles in B Lymphocyte Growth and Proliferation Responses”</td>
</tr>
<tr>
<td>Jessica Lakritz</td>
<td>“Monocyte/ macrophage Activation and Traffic Mediates HIV and SIV-Associated Peripheral Neuropathy”</td>
</tr>
<tr>
<td>Sudeshna Saha</td>
<td>“Functional Analysis of Putative Calcium Signaling Proteins in Toxoplasma Invasion”</td>
</tr>
<tr>
<td>Rashmi Dubey</td>
<td>“Deciphering the Mechanism and Function of Stage-Specific Protein Association with the Membrane Cytoskeleton of Toxoplasma Gondii”</td>
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</table>

Recent Placements

ACADEMIC PLACEMENTS

<table>
<thead>
<tr>
<th>Institution</th>
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<tbody>
<tr>
<td>Baylor College of Medicine</td>
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<tr>
<td>Beth Israel Deaconess Medical Center</td>
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<tr>
<td>Boston University School of Medicine</td>
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<tr>
<td>Broad Institute of Harvard and MIT</td>
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NON-ACADEMIC PLACEMENTS

<table>
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<tr>
<th>Company</th>
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<tbody>
<tr>
<td>AstraZeneca</td>
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<td>BERG Health</td>
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<tr>
<td>Biogen</td>
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<tr>
<td>Cell Signaling Technology</td>
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<td>Dovetail Genomics</td>
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<td>Excelimmune</td>
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<td>Facebook</td>
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<td>Fenway Community Health</td>
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<tr>
<td>Google</td>
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<tr>
<td>Human Metabolome Technologies</td>
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<td>Illumina</td>
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<tr>
<td>Jackson Laboratories</td>
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<tr>
<td>Maine Medical Center</td>
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<td>Momenta Pharmaceuticals</td>
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<tr>
<td>Nektar Therapeutics</td>
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<tr>
<td>Novartis</td>
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<tr>
<td>Perkin Elmer</td>
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<tr>
<td>Renovo Neural, Inc</td>
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<tr>
<td>Sanofi/Genzyme</td>
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<tr>
<td>Seven Bridges Genomics</td>
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<tr>
<td>Trinity Partners</td>
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The oldest and largest of the University’s eight schools and colleges, the Morrissey College of Arts and Sciences offers graduate programs in the humanities, social sciences and natural sciences, leading to the degrees of Doctor of Philosophy, Master of Arts and Master of Science. In addition, numerous dual-degree options are offered in cooperation with the Carroll School of Management, the Boston College Law School, the Lynch School of Education and the Graduate School of Social Work.

With approximately 1,000 students and 400 full-time faculty, the Graduate School is small enough to know you as a person, but large enough to serve you and prepare you for a rewarding life and satisfying career.

Research Facilities

The Department of Biology, in Higgins Hall, is well-equipped for modern molecular, genomic and proteomic research, biochemistry, imaging and bioinformatics.

Departmental genomics and proteomics infrastructure includes two new Illumina sequencers capable of sequencing over half a billion DNA molecules per day, DNA/RNA and protein quantification instruments, several qRT-PCR systems, 2D gel proteomic analysis, a multi-color analytical FACS and FACS cell sorter. Additionally, we possess state-of-the-art cell culture and animal facilities, a liquid handling robot, a Microplate fluorescence reader with robotic stacker, a 3-D printer, various imaging capabilities, including a Typhoon FLA9500 laser scanner, and protein purification systems, including HPLC, FPLC and preparative isoelectric focusing.

In addition to lab-dedicated microscopes, we offer a professionally staffed imaging facility that includes a Leica laser scanning confocal microscope, a Nikon spinning disk confocal microscope, a Zeiss Axioplan microscope fit with an ApoTome and additional wide-field fluorescence microscopes.

The departmental bioinformatics computing platform consists of a 132 CPU-core cluster. It is available free of charge to faculty, graduate students and other researchers. Additionally, faculty, students and staff have access to the University central computing cluster, and individual laboratories may have their own dedicated computing systems.

Academic Resources

BOSTON AREA CONSORTIUM

The Boston Area Consortium allows graduate students to cross-register for courses at Boston University, Brandeis University and Tufts University.

BOSTON COLLEGE LIBRARIES

The University is home to eight libraries, containing 2.95 million volumes; more than 700 manuscript collections, including music, photos, art and artifacts; 625,000 e-books; and more than 600 electronic databases. O’Neill Library, Boston College’s main library, offers subject-specialist librarians to help with research, to set up alerts to publications in areas of interest and to answer any research- and library-related questions.

THE BOSTON LIBRARY CONSORTIUM

The Boston Library Consortium allows Boston College students access to millions of volumes and other services at 19 area institutions in addition to the world-class resources available through the Boston College Library System.
Boston College is located on the edge of one of the world’s most vibrant cities. Just six miles from downtown Boston—an exciting and dynamic place to live and learn—Boston College is an easy car or “T” ride away from a booming center for trade, finance, research and education.

Home to some of New England’s most prestigious cultural landmarks, including the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Boston Symphony Hall and the Freedom Trail, Boston provides a rich environment for those passionate about art, music and history. For sports fans, Boston hosts a number of the country’s greatest sports teams: the Celtics, Patriots, Bruins and, of course, Fenway Park’s beloved Red Sox. Found within a short drive from Boston are some of New England’s best recreational sites, from the excellent skiing in New Hampshire to the pristine beaches of Cape Cod.

Boston also offers a wide range of family friendly attractions, including the Children’s Museum, New England Aquarium, Franklin Park Zoo and the Museum of Science. There are roughly 50 universities located in the Boston area, and the large student population adds to the city’s intellectually rich and diverse community. Events, lectures and reading groups hosted by world-renowned scholars abound on area campuses, providing abundant opportunities to meet and network with other graduate students and faculty throughout the Boston area.

The University

Boston College is a Jesuit university with 14,250 students, 805 full-time faculty and more than 175,000 active alumni. Since its founding in 1861, the University has known extraordinary growth and change. From its beginnings as a small Jesuit college intended to provide higher education for Boston’s largely immigrant Catholic population, Boston College has grown into a national institution of higher learning that is consistently ranked among the top universities in the nation: Boston College is ranked 31st among national universities by *U.S. News & World Report*.

Today, Boston College attracts scholars from all 50 states and over 80 countries, and confers more than 4,000 degrees annually in more than 50 fields through its eight schools and colleges. Its faculty members are committed to both teaching and research and have set new marks for research grants in each of the last 10 years. The University is committed to academic excellence. As part of its most recent strategic plan, Boston College is in the process of adding 100 new faculty positions, expanding faculty and graduate research, increasing student financial aid and widening opportunities in key undergraduate and graduate programs.

The University is comprised of the following colleges and schools: Morrissey College of Arts and Sciences, Carroll School of Management, Connell School of Nursing, Lynch School of Education, Woods College of Advancing Studies, Boston College Law School, Graduate School of Social Work and School of Theology and Ministry.

General Resources

Housing

While on-campus housing is not available for graduate students, most choose to live in nearby apartments. The Office of Residential Life maintains an extensive database with available rental listings, roommates and helpful local real estate agents. The best time to look for fall semester housing is June through the end of August. For spring semester housing, the best time to look is late November through the beginning of the second semester. Additionally, some graduate students may live on campus as resident assistants. Interested students should contact the Office of Residential Life.
STUDENT LIFE & CAMPUS RESOURCES

JOHN COURTNEY MURRAY, S.J., GRADUATE STUDENT CENTER
One of only a handful of graduate student centers around the country, the Murray Graduate Student Center is dedicated to the support and enrichment of graduate student life at Boston College. Its primary purpose is to build a sense of community among the entire graduate student population and cultivate a sense of belonging to the University as a whole. Its amenities include study rooms, a computer lab, two smart televisions, kitchen, deck and patio space, complimentary coffee and tea, and more. Throughout the year, the center hosts programs organized by the Office of Graduate Student Life and graduate student groups. The Murray Graduate Student Center also maintains an active job board (available electronically), listing academic and non-academic opportunities for employment both on and off campus.

MCMULLEN MUSEUM OF ART
Serving as a dynamic educational resource for the national and international community, the McMullen Museum of Art showcases interdisciplinary exhibitions that ask innovative questions and break new ground in the display and scholarship of the works on view. The McMullen regularly offers exhibition-related programs, including musical and theatrical performances, films, gallery talks, symposia, lectures, readings and receptions that draw students, faculty, alumni and friends together for stimulating dialogue. Located on the main campus, the McMullen Museum is free to all visitors.

CONNORS FAMILY LEARNING CENTER
Working closely with the Graduate School, the Connors Family Learning Center sponsors seminars, workshops and discussions for graduate teaching assistants and teaching fellows on strategies for improving teaching effectiveness and student learning. Each fall, the Learning Center and the Graduate School hold a “Fall Teaching Orientation” workshop designed to help students prepare for teaching. The center also hosts ongoing seminars on college teaching, higher learning and academic life; assists graduate students in developing teaching portfolios; and provides class visits and teaching consultations, upon request. Through these and other activities, the Connors Family Learning Center plays an important role in enhancing the quality of academic life at Boston College.

FLYNN RECREATION COMPLEX
The 144,000-square-foot Flynn Recreation Complex houses a running track; tennis, basketball, volleyball, squash and racquetball courts; an aquatics center with pool and dive well; saunas and more. Its 10,000-square-foot Fitness Center offers more than 100 pieces of cardio equipment, a full complement of strength training equipment and free weights, an air-conditioned spin studio and three air-conditioned group fitness studios. During the academic year, BC Rec holds more than 80 group fitness classes per week in a variety of disciplines, including Zumba, spin, yoga, strength training, Pilates and more.

BOSTON COLLEGE CAREER CENTER
The Boston College Career Center works with graduate students at each step of their career development. Services include self-assessment, career counseling, various career development workshops, resume and cover letter critiques, and practice interviews. In addition to extensive workshop offerings, Career Center staff members are available throughout the year for one-on-one advising about any aspect of the career path. The Career Resource Library offers a wealth of resources, including books, periodicals and online databases.
ADMISSION & FINANCIAL INFORMATION

Admission Requirements
The application deadline for fall admission is December 15. Please visit bc.edu/gsas for detailed information on how to apply.

Application requirements include:

- **Application Form:** Submitted online, via the GSAS website.
- **Application Fee:** $75, non-refundable.
- **Abstract of Courses Form:** A concise overview of background and related courses completed in an intended field or proposed area of study.
- **Official Transcripts:** Demonstrating coursework completed/degree conferral from all post-secondary institutions attended.
- **GRE General Test:** Official score report required for all applicants.
- **Three Letters of Recommendation:** From professors or supervisors. It is highly advisable that at least one letter be from an academic source.
- **Statement of Purpose:** A brief (1-2 page) discussion of an applicant’s preparation, motivation and goals for their proposed course of study.
- **Proof of English Proficiency:** Official TOEFL/IELTS score reports accepted.

Financial Assistance

DEPARTMENT FUNDING
Full funding is available for qualified Ph.D. students. Students function as either teaching assistants or research assistants and receive a stipend in exchange for their services. In addition, they receive a full-tuition scholarship for all coursework relative to their program of study.

FEDERAL FINANCIAL AID
Graduate students can apply for federal financial aid using the FAFSA. The loans that may be available to graduate students are the Federal Direct Unsubsidized Stafford Loan and Perkins Loan, based on eligibility. If additional funds are needed, student may apply for a Grad Plus Loan. For more information, see the Graduate Financial Aid website at bc.edu/gradaid or contact the Graduate Financial Aid Office at 617-552-3300 or 800-294-0294.

OFFICE OF SPONSORED PROGRAMS
The Office of Sponsored Programs (OSP) assists both faculty and graduate students in finding sources of external funding for their projects and provides advice in the development of proposals. OSP maintains a reference library of publications from both the public and private sectors listing funding sources for sponsored projects. In the recent past, graduate students have received research support from prominent agencies, corporations and organizations such as the Fulbright Commission, the Guggenheim Foundation, the National Science Foundation, the American Political Science Association, the American Chemical Society and the American Association of University Women.