Boston University

Graduate Program in Bioinformatics

MS Handbook

2022-23

http://www.bu.edu/bioinformatics

Department of Biochemistry (School of Medicine)
Department of Biology (College of Arts and Sciences)
Biomedical Engineering Department (College of Engineering)
Department of Chemistry (College of Arts and Sciences)
Department of Computational Biomedicine (School of Medicine)
Department of Computer Science (College of Arts and Sciences)
Computing & Data Sciences (CDS)
Electrical and Computer Engineering Department (College of Engineering)
Genetics and Genomics Department (School of Medicine)
Department of Mathematics and Statistics (College of Arts and Sciences)
Department of Mechanical Engineering (College of Engineering)
Department of Medicine (School of Medicine)
Department of Microbiology (School of Medicine)
Pharmacology & Experimental Therapeutics (School of Medicine)
Department of Physics (College of Arts and Sciences)
Pulmonary Medicine (School of Medicine)
Systems Engineering Division (College of Engineering)
Center for Computational Science
Center for Advanced Biotechnology
Center for Advanced Genomic Technology

Last Updated: 8/25/22

Bioinformatics Faculty and Staff

Faculty

Director

Thomas Tullius	Director of Bioinformatics

Associate Directors

Gary Benson*	Director of Graduate Studies

Master's Program

Adam Labadorf	MS Program Director

Department of Biochemistry (BUSM)

Andrew Emili	Professor
Nelson Lau	Associate Professor
Valentina Perissi	Associate Professor
Joseph Zaia	Professor, Assoc. Director, Center for Biomed Mass Spec

Department of Biology (CAS)

Jennifer Bhatnagar	Assistant Professor
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Sarah Davies	Assistant Professor
John Finnerty	Associate Professor
Ana Fiszbein	Assistant Professor
Juan Fuxman-Bass	Assistant Professor
Kimberly McCall	Associate Professor
Daniel Segre*	Associate Professor
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Dean Tolan	Professor
David Waxman	Professor
Zeba Wunderlich	Assistant Professor

Department of Biomedical Engineering (ENG)

Charles DeLisi*	Metcalf Professor
Mary J. Dunlop	Associate Professor
James Galagan*	Associate Professor
Simon Kasif*	Professor
Ahmad 'Mo' Khalil	Associate Professor
Allyson E. Sgro	Assistant Professor
Sandor Vajda*	Professor, Director of Biomolecular Engineering Research Center

Department of Chemistry (CAS)

Karen Allen	Professor
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Sean Elliott	Professor
Pinghua Liu	Professor
Thomas Tullius	Professor

Department of Computational Biomedicine (BUSM)

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Joshua D. Campbell*	Assistant Professor
W. Evan Johnson*	Assistant Professor
Mark Lenburg*	Associate Professor of Medicine

Department of Computer Science (CAS)

Gary Benson*	Associate Professor
Mark Crovella*	Professor

Computing & Data Sciences (CDS)

Brian Cleary	Assistant Professor
Pawel Przytycki	Assistant Professor

Department of Electrical and Computer Engineering (ENG)

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Department of Genetics and Genomics (BUSM)

Lindsay Farrer	Professor, Chief of Genetics Program and Director of Genetic Epidemiology

Department of Mathematics and Statistics (CAS)

Luis Carvalho*	Assistant Professor
Jonathan Huggins	Assistant Professor
Samuel Isaacson*	Assistant Professor
Mark Kon*	Professor

Department of Mechanical Engineering (ENG)

Calin Belta*	Associate Professor

Department of Medicine (BUSM)

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Gyungah Jun	Assistant Professor
Vijaya Kolachalama	Assistant Professor
Darrell Kotton	Professor
Adam Labadorf	Assistant Professor
Stefano Monti*	Associate Professor
Xiaoling Zhang	Assistant Professor

Department of Microbiology (BUSM)

Tanya Colpitts	Assistant Professor
John Connor	Assistant Professor
Tom Kepler*	Professor

Department of Pharmacology & Experimental Therapeutics (BUSM)

Julia TCW	Assistant Professor

Department of Physics (CAS)

Kirill Korolev*	Assistant Professor
Pankaj Mehta*	Assistant Professor

Department of Pulmonary Medicine (BUSM)

Avrum Spira	Professor, Chief, Division of Computational Biomedicine
Katrina Steiling	Assistant Professor

Systems Engineering Division (ENG)

Calin Belta*	Associate Professor

* Computational faculty

Staff

Mary Ellen Gipson-Fitzpatrick, Systems Administrator
David King, Graduate Program Coordinator
Caroline Lyman, Assistant Director
Johanna Vasquez, Administrative Coordinator

Overview

The graduate program in bioinformatics at Boston University provides interdisciplinary training for students of exceptional motivation. The program includes some 50 active faculties from five Colleges: Engineering, Arts and Sciences, Dentistry, Medicine and Public Health, and focuses on the molecular biology and physics of the cell, emphasizing the use of advanced mathematics and computation. Because we are educating future leaders, the program also includes training designed to sensitize students to the social impact of technology, including ethical and legal implications of emerging technologies.

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The Bioinformatics M.S. Program

I. Degree Requirements

The master's degree requires a total of 32 credits. The emphasis of the MS in Bioinformatics program is preparation for careers that involve using bioinformatics in research or in the biotechnology or pharmaceutical industries. Credits earned in the M.S. program may be applicable to the Ph.D. program, but the M.S. program is not intended to be a stepping-stone towards a Ph.D. (M.S. candidates wishing to enter the Ph.D. program must apply for admission to that program via the normal application process.) In order to receive a master's degree, students must demonstrate mastery of the core subject matter (no lower than a 'B' in all core courses). They must also demonstrate a working knowledge of computational methods available to the modern bioinformatician by completing an internship as part of their degree requirements. Upon completion of the internship, the student is required to submit a written report on the internship experience (see guidelines below). This report serves in lieu of an M.S. thesis. A brief written performance evaluation from the intern's supervisor is also required. Internships credit is obtained by registering for BF 541, Bioinformatics Internship, or BF 501, Bioinformatics Master's Project.

Core Course Requirements:

The following courses are required (**24** credits)

Course #	Course Name	Credits	Offered
BF 527	Applications in Bioinformatics	4	Fall & Spring
BF 550	Foundations of Programming, Data Analytics, and Machine Learning in Python	4	Fall
BF 751	Molecular Biology and Biochemistry for Bioinformatics	4	Fall
BF 528	Applications in Translational Bioinformatics	4	Spring
BF 768	Biological Database Systems	4	Spring
BF 831	Translational Bioinformatics Seminar	2	Fall
BF 541	Bioinformatics Internship	2	Spring, Fall, Summer

Fulfillment of core course **equivalents** will be determined based on documented previous academic and/or work experience. The students and his or her advisor will petition the curriculum committee for such equivalencies. When either past work or an alternate course has been accepted as a core equivalent, the student's advisor will recommend other courses to fulfill the credit hours. **Advanced elective courses should be taken in place of any waived course requirements**.

Suggested Curriculum:

A. First Year:

FALL SEMESTER
1) ENG BF 527: Applications in Bioinformatics (4 cr)
2) ENG BF 550: Fnds of Programming, Data Analytics, & Machine Learning in Python (4 cr)
3) ENG BF 751: Molecular Biology and Biochemistry for Bioinformatics (4 cr)
4) ENG BF 831: Translational BF Seminar (2 cr)

SPRING SEMESTER
1) BF 528 Translational Bioinformatics Applications (4 cr)
2) BF 768 Biological Database Systems (4 cr)
3) Elective
4) Elective

SUMMER: Students may begin the internship

B. Second Year (if needed):

FALL SEMESTER
1) Elective(s)

Background enhancement: Typically, students enrolling in the Bioinformatics M.S. Program have strength in either the computational area or in biochemistry/molecular biology, but not both. In consultation with their academic adviser, they may decide to take or audit some introductory courses to strengthen areas where their background has deficiencies. Examples of such courses (which do *not* carry graduate credit) are CS111 *Introduction to Computer Science I,* CS112 *Introduction to Computer Science II,* CS 330 *Introduction to Analysis of Algorithms,* MA 242 *Linear Algebra,* MA 213 *Basic Statistics and Probability,* MA 116 *Statistics II,* BI 203 *Cell Biology,* CH 351 *Physical Chemistry I,* CH 373 *Principles of Biochemistry,* and BI 206 *Genetics*

Approved Elective Courses
ENG BE 560: Biomolecular Architecture
ENG BE 562: Computational Biology: Genomes, Networks, Evolution
ENG BE 564: Biophysics of Large Molecules
ENG BE 565: Molecular Biotechnology
ENG BE 566: DNA Structure and Function
ENG BE 568: Systems Biology of Human Disease
ENG BE 569: Next Generation Sequencing: Technology, Data Analysis & Biomed Applications
ENG BE 700/GRS PY 895: Methods and Logic in Quantitative Biology
ENG BE 777: Computational Genomics
ENG BF 510: Institutional Racism in Health and Science
ENG BF 591: Special Topics in Bioinformatics
ENG BF 778: Physical Chemistry for Systems Biology
CAS BI/CH 527: Biochemistry Laboratory I
CAS BI/CH 528: Biochemistry Laboratory II
CAS BI 502: Topics in the Theory of Biological Networks
CAS BI 504: Advanced Evolutionary Analysis
CAS BI 549: Molecular Phylogenetics and Evolution

CAS BI 552: Molecular Biology I
CAS BI 553: Molecular Biology II
CAS BI 556: Membrane Biochemistry and Cell Signaling
CAS BI 560: Systems Biology
CAS BI 572: Advanced Genetics
GRS BI 610: Developmental Biology
GRS BI 611: Microbiome: Our Intimate Relationship with Microorganisms
GRS BI 735: Advanced Cell Biology
GRS BI 753: Advanced Molecular Biology
GRS BI 755: Cellular and Systems Neuroscience
CAS BB 522: Molecular Biology Laboratory
CAS CH 525: Physical Biochemistry
GRS CH 626: Epigenetics: Protein, DNA & RNA Modifications & their Roles in Biological Processes
GRS CH 751: Advanced Topics in Physical Chemistry
GRS CH 752: Advanced Topics and Chemical Physics
CAS CS 506: Computational Tools for Data Science
CAS CS 542: Machine Learning
CAS CS 543: Algorithmic Techniques for Taming Big Data
CAS CS 549: Pattern Matching and Detection with Applications in Biological Sequence Analysis
CAS CS 565: Algorithmic Data Mining
SPH BS 730: Introduction to R: Software for Statistical Computing
SPH BS 831: Genomics Data Mining and Statistics
SPH BS 845: Applied Statistical Modeling and Programming in R
SPH BS 849: Bayesian Modeling for Biomedical Research and Public Health
SPH BS 858: Statistical Genetics I
SPH BS 859: Applied Genetic Analysis
SPH BS 860: Statistical Genetics II
CAS MA 555: Numerical Analysis I
CAS MA 565: Mathematical Models in the Life Sciences
CAS MA 575: Linear Models
CAS MA 576: Generalized Linear Models
CAS MA 579: Numerical Methods for Biological Sciences
CAS MA 581: Probability
CAS MA 582: Mathematical Statistics
CAS MA 583: Introduction to Stochastic Processes
CAS MA 584: Multivariate Statistical Analysis
GRS MA 614: Statistical Methods II
GRS MA 615: Data Science in R
GRS MA 684: Applied Multiple Regression and Multivariable Methods
GRS MA 770: Mathematical and Statistical Methods of Bioinformatics
GRS MA 881: Statistics Seminar I
GRS MA 882: Statistics Seminar II
GRS MB 721: Graduate Level Biochemistry
GRS MB 722: Advanced Biochemistry
GRS PY 771: Systems Biology for Physical Scientists and Engineers
GMS GE 701: Principles of Genetics and Genomics
GMS PA 600: Intro to Pathology & Pathophysiology of Disease
ENG EC 533: Advanced Discrete Mathematics
ENG EC 534: Discrete Stochastic Models
ENG EC 730: Information-Theoretical Design of Algorithms

Colleges:
ENG = College of Engineering **GRS** = Graduate School of Arts and Sciences **CAS** = College of Arts and Sciences
SPH = School of Public Health **GMS** = Graduate Medical Sciences

Departments:
BE = Biomedical Engineering **BF** = Bioinformatics **BI** = Biology **BS** = Biostatistics

CH = Chemistry **CS** = Computer Science **EC** = Electrical and Computer Engineering **MA** = Mathematics
MB = Molecular Biology, Cell Biology and Biochemistry (MCBB) **PA** = Pathology **PY** = Physics

II. Master's Advising System

Academic Advisor

Each student is assigned an academic advisor upon entry to the program. Students should consult with their academic advisor to tailor their coursework to meet specific curricular needs in the transition into an interdisciplinary program.

III. Internship Program

Guidelines

Internships provide the bridge between classroom/laboratory study and "real-world" employment. Each student must complete an internship with a minimum of 400 hours of on-the-job experience (*e.g.,* 10 weeks full-time work in the summer). The format is very flexible, and part-time internships running concurrently with classes or employment are acceptable. Students whose regular, full-time job includes a strong bioinformatics component over at least a 6-month period can request that this be considered an internship. Students must consult with their academic advisor to assess the suitability of a proposed internship. For this purpose, "bioinformatics" means extensive use of computational tools to analyze, display and/or archive biological information (usually at the molecular level). The project supervisor must be familiar with the tools employed, and if possible, the position should involve regular interaction with "wet-bench" scientists. While most internships will take place in industrial settings, suitable projects can also be carried out in non-profit or academic research laboratories. In every case the student must submit the MS Internship Approval from to the Program Director *before* commencing an internship. After receiving approval, students will register for the BF internship class (ENG BF541) for 2 credits. *For full-time students the internship should begin no later than the third semester after beginning the M.S. program.*

Finding an Internship

Students have the final responsibility for finding an internship. The Bioinformatics Program Office maintains a list of past internship placements. These can serve as potential leads for current students. From time to time the office will solicit additions to this list through the Program's industrial advisers, and we also receive unsolicited inquiries seeking suitable interns. These latter are announced to the MS students via email. Job fairs in the biotechnology area occur here in Boston and students should attend them whenever possible. Not only do they help make connections with potential internship sponsors, but they also give an opportunity to learn about current trends in the industry. Company websites may also be useful. And, of course, the network of bioinformatics students should provide many useful suggestions.

Internship Report

At the conclusion of the internship the student must submit a report that summarizes (a) the project he/she worked on (in general terms), (b) work accomplished (with very specific emphasis on the student's contribution), and (c) description of the impact of the experience on the student's professional development. Reports need not be more than two double-spaced text pages in length, though longer reports are acceptable. Append any detailed material that supports the narrative (tables, figures, publications, progress reports etc.). In cases where confidentiality agreements restrict release of pertinent project details, the report can describe the work in terms sufficiently general as to be acceptable to the company in which the work was done.

Supervisor's Evaluation

The supervisor must provide a brief written evaluation of the intern and his/her work. A letter or an email will suffice. The quality of the intern's technical work and his/her ability to function as part of a research or development team should comprise the bulk of the evaluation. Communication skills and ability to work independently are also important points to include.

Course Descriptions

CORE COURSES

BF 527: Applications in Bioinformatics
Prereq: CAS BI/CH 421 or CAS BI 203 and BI 206 and consent of instructor; CAS MA 121, MA 123 or MA 127 or equivalent. The material will be presented in a case-based format, using real-world examples to investigate the most widely used bioinformatics applications, e.g., BLAST, Clustal, GRAIL, INSIGHT II, or RASMOL. We will address a broad range of biological questions currently addressed via genomic data, including sequence alignment, pattern recognition and identification, extrapolation of sequence to structure, and intermolecular interactions. 4 cr.

BF 528 Applications in Translational Bioinformatics
Bioinformatics is an interdisciplinary field devoted to managing and analyzing largescale biological data, such as the DNA sequence of the human genome, and has become an essential tool in interpreting and translating biological knowledge for use in a clinical setting. This course introduces graduate and upper–level undergraduate students to the principles of bioinformatic analysis applied to translational studies. Application topics will include gene expression analysis, biomarker development, and Genome Wide Association Studies (GWAS). Bioinformatics methods including microarray analysis, short read sequence analysis, biological pathways and geneset enrichment analysis, and Quantitative Trait Loci (QTL) will be covered. Lectures and assignments will be designed around reproducing the results of preselected studies from the literature that exemplify the topics. The primary focus will be using existing software tools and published data to perform analyses, but most tasks will require some programming. *Dr. Labadorf*

BF 550 Foundations of Programming, Data Analytics, and Machine Learning in Python
Prereq: An introductory programming course in any language or Introduction to Computer Science and Programming Using Python from EdX. This course is for students trained in life sciences with minimal exposure to programming, statistics, and data analysis. The goal of the course is to develop both practical skills and theoretical foundations in handling data sets and developing simple computational solutions to problems arising in biomedical research.

BF 751 – Molecular Biology and Biochemistry for Bioinformatics
Modern research in the life sciences is an increasingly interdisciplinary endeavor where new fields of study have developed at the interfaces of biology, chemistry, physics, mathematics, and computer science. In many instances, the development of these new fields goes hand in hand with development of new experimental approaches to surveying the content of the cell. While, traditional molecular cell biology and biochemistry courses often focus on the basic details of cell physiology and macromolecular (DNA, lipid, protein) structures, they too often neglect the quantitative aspects of number, scale, forces, etc. that are crucial to providing a larger context

within living systems. This course aims at reframing the basic concepts of cell and molecular biology in a quantitative context and providing a basic overview of some of the key approaches used to develop a quantitative framework inside the cell. How this detailed information can then be applied to bioinformatics research problems will also be explored.

ENG BF 768: Biological Database Analysis
Prereq: CS 112 or CS 113, graduate standing, or consent of instructor. Background knowledge of biochemistry and genetics. Describes relational data models and database management systems. Teaches the theories and techniques of constructing relational databases with emphasis on those aspects needed for various biological data, including sequences, structures, genetic linkages and maps, and signal pathways. Introduces relational database query language SQL. Summarizes currently existing biological databases and the Web-based programming tools for their access. Object-oriented modeling is introduced primarily as a design aid for dealing with the particular complexities of biological information in standard RDB design. Emphasis will be on those problems associated with dealing with data whose nomenclature and interrelationships are undergoing rapid change. 4 cr.

ENG BF 831: Translational Bioinformatics Seminar
This course enrolls students who intend to pursue careers in medicine, dental medicine and/or medical research (either academic or industrial) – in particular, students in the BF for Translational Medicine track of the Bioinformatics MS program. After commencing briefly with general introductory material (published reviews and other relevant back-ground information), students will proceed to examine, discuss and evaluate recent papers that directly illustrate the use of bioinformatics either in pre-clinical or clinical research settings. Papers will be drawn from high-impact journals such as Nature, Science, PNAS, Cell, and Science Translational Medicine. Students will take turns presenting the papers to the class and provide a critical review of each, both orally and in writing. They will also complete a term paper in the form of a research proposal directed to the goal of using bioinformatics to advance a medical procedure – either diagnostic or therapeutic. Brief guest presentations by researchers in BUSM laboratories will be arranged as appropriate.

BIOINFORMATICS COURSES

ENG BF 510: Institutional Racism in Health and Science
Historically, pseudoscientific theories have provided the justification for establishing and maintaining racial hierarchies, which resulted in centuries of dehumanizing and unethical practices meted out to Blacks, Indigenous, and People of Color (BIPOC). Unfortunately, many of these pernicious ideas persist, such that they hinder BIPOC's opportunities in Science and exacerbate their health outcomes.

This course traces the historical roots (e.g. mischaracterization of race as a biological construct) and physiological manifestations of racism in science, and examines harmful consequences on victims' health outcomes.

ENG BF 541: Internship in Bioinformatics
This course allows M.S. and Ph.D. students in bioinformatics to take part in an industrial internship. Students will be required to present a report on their training and/or make a presentation and poster as a part of participating in the University's Science Day program (annual in March). Variable credits

ENG BF 501, 502: Master's Project
For MS students in bioinformatics. Participation in a research project under the direction of two faculty advisors. Variable credits

Graduate School of Arts and Sciences General Guidelines

Time Limits
The MS program shall be completed within three years after the first registration for study leading to the master's degree.

Residency Requirement
Each student must satisfy a residency requirement of a minimum of two consecutive regular semesters of graduate study at Boston University. In order to graduate, students must be registered part- or full time in the semester or summer term in which they complete degree requirements, as well as in the preceding semester.

Transfer of Credit
Graduate-level courses in other accredited graduate schools or in other Schools or Colleges of Boston University not used toward the awarding of any other degree may be transferred on recommendation of the major advisor and the Director of the department with the approval of the Graduate School. Credit for work to be taken concurrently with studies in the Graduate School of Arts and Sciences must be approved before registration for such courses; all such courses must have been taken for a letter grade (not pass/fail). No transfer of credit for courses taken before the senior year of college or from correspondence or extension schools will be accepted. Petitions for credits for transfer are available in the GRS Records Office.

Registration
Candidates for admission may not register until they receive a formal statement of acceptance. Registration is conducted under the direction of the Office of the University Registrar. Graduate students should consult the Bioinformatics Office, for detailed instruction concerning the procedure to be followed during the announced registration period. Students must be registered for any regular semester or Summer Term during which a degree requirement is completed or University facilities are used.

Students must be registered every semester or be granted an official leave of absence. Failure to register without having been granted an authorized leave of absence may result in termination of degree status.

Registration Deadlines
A student in the Graduate School of Arts and Sciences should complete the course selection process by May for the fall semester and December for the spring semester. The deadline for payment/settlement of a student's account appears in The Guide published by the Office of Student Accounting Services. A new graduate student usually completes registration during the week prior to the beginning of classes. Late fees are charged to students who do not register or settle their tuition account during the official period. Students may not register later than one week after the start of classes without written approval from their School or College. Students who are not registered by the deadline will have their financial assistance offers revoked.

Adding or Dropping a Course
Students wishing to change their courses must complete a Class Adjustment Form, obtain their advisor's signature, and return the completed form to the Graduate Program Coordinator.

No course may be added after the first two weeks of class. A course dropped during the first five weeks of class will not appear on the student's permanent record. After the first five weeks, a dropped course will appear on the student's record as W, and the student will be charged for the course. No course may be dropped after the eighth week of class. Graduate School financial aid will not cover the cost of a course from which a student has officially withdrawn. Students who register for any course are held responsible for its completion unless they officially withdraw by the deadline date or change to the status of auditor within the first five weeks of class.

Full-Time Students
By enrollment— A student enrolled in three to four-and-a-half courses (12 to 18 credits) will be considered full-time and will be charged full tuition and fees. A student may register for more than four courses (16 credits) only with approval of the Graduate School's Committee on Academic Standards.

By certification— a student registered for fewer than three courses or 12 credits (a minimum of one course must be taken until all coursework requirements have been completed) but engaged otherwise in full-time study, research, or teaching pertinent to the completion of degree requirements or to gaining competence in the field of study, may be certified as a full-time student. Such a student must pay tuition on a per-course basis and full-time fees. A student desiring full-time certification must submit to the Graduate Program Coordinator, during the official registration period, a completed full-time certification form approved by the advisor.

Part-Time Students
All part-time students who are candidates for degrees must register each regular semester for no less than one semester course until all departmental course requirements are completed.

Incomplete Coursework and Grade Changes
When the work of a course has not been completed within the semester of registration, the grade of I is used. This automatically becomes a permanent I (unsatisfactory grade) unless the coursework is completed within the following calendar year. Grades of I and C+ or lower are interpreted as failures. A student receiving such grades in more than two semester courses (or more than a total of 8 credit hours) is terminated. Grades, including incompletes, may not be changed after a period of one year from the time the original grade is recorded.

Graduation
MS degrees are awarded in August, January, and May. Commencement exercises are held in May only. Students planning to receive their degrees must complete the online Intent to Graduate form by late-May for August graduation, by late-September for January graduation, and late January for May graduation. The Intent to graduate is valid only for the graduation date specified; a new form must be filed if the student does not graduate as planned.

Suspension or Dismissal
Boston University, through its various faculties or appropriate committees, may suspend or dismiss any student from the University for reasons of scholarship, aptitude, or conduct.

Leave of Absence and Withdrawal
Normally, students must register for each regular semester until completion of all degree requirements. Upon written request to the Graduate School of Arts and Sciences, a student will be allowed up to two semesters of leave of absence without committee consideration. Leaves of absence beyond two semesters may be granted in cases of substantiated illness, one-semester maternity or paternity leave, or military service. In exceptional cases, the student should petition the Associate Dean of the Graduate School of Arts and Sciences with approval of the chairman of the department or division of concentration.

A student who files for a leave of absence from the University before classes start is eligible to receive full credit of tuition and fees. Students should refer to "Withdrawals and Refunds" in the GRS Bulletin for the refund schedule after the beginning of classes. A student who is on leave and who has borrowed federal and/or private loans may be required to begin repayment while on leave. If leave is granted, a certificate of authorized leave of absence is issued and a copy included in the student's record.

The period of authorized leave of absence is counted as a part of the time allowed for completion of degree requirements. Students may not complete any degree requirements in a semester for which they have been granted leave of absence.

Students who wish to withdraw or take a leave of absence from the University must submit their requests in writing to the GRS Records Office, Suite 112, 705 Commonwealth Avenue, Boston, MA 02215. The Graduate School will be responsible for notifying the student's major department. A request for a withdrawal or leave of absence is effective on the day it is received in the appropriate office; charges are canceled in accordance with the University's published refund schedule, based on the effective date of the student's leave of absence or withdrawal. Mere absence from class does not reduce financial obligations or guarantee that final grades will not be recorded.

Readmission to a Degree Program
Students applying for readmission to the Graduate School of Arts and Sciences will be subject to the following regulations: a minimum of two years must elapse from the time of withdrawal or termination until enrollment; reapplication must be accompanied by an application fee; if readmitted, the student may be asked to retake examinations or demonstrate knowledge in current issues in the field of specialization; readmitted students will be subject to the rules and regulations set forth in the Graduate School of Arts and Sciences Bulletin at the time of readmission; students who have outstanding financial obligations to the University at the time of withdrawal or termination will be required to meet those obligations as a condition of readmission; at the time of readmission, the student must provide a detailed schedule of plans for completing the remaining degree requirements within specific time limits.

Identification Cards and Numbers
Terrier cards are issued by the Terrier Card Office and the Office of the University Registrar. Students are assigned an ID number by the University.

A student is entitled to a new card only when there are changes to the information on the card. A fee is charged for replacing a lost card. Replacement cards are issued at the Terrier Card Office and the Office of the University Registrar.
** For more information about the GRS General Guidelines please see their bulletin either in print format or online at http://www.bu.edu/bulletins/grs.