MATH1100 Sections 01, 02, 03: Calculus I
Fall 2018 Syllabus

Required course meetings:

Lectures: Monday, Wednesday, Friday

Section 01: at 12:00 - 12:50 pm in Cushing Hall 001

Section 02: at 1:00 - 1:50 pm in Cushing Hall 001

Section 03: at 3:00 - 3:50 pm in Cushing Hall 209

Discussion: You must register for one of the following co-requisite sections

MATH1121 Section 01 Tuesday at 8:00 - 8:50 am in	Gasson Hall 301 by MR
MATH1121 Section 02 Tuesday at 9:00 - 9:50 am in	Gasson Hall 301 by MR
MATH1121 Section 03 Tuesday at 10:00 - 10:50 am in	Gasson Hall 301 by FB
MATH1121 Section 04 Tuesday at 12:00 - 12:50 pm in	Gasson Hall 301 by FB
MATH1121 Section 05 Tuesday at 1:00 - 1:50 pm in	Gasson Hall 301 by MR
MATH1121 Section 06 Tuesday at 2:00 - 2:50 pm in	Gasson Hall 301 by MR
MATH1121 Section 07 Tuesday at 3:00 - 3:50 pm in	Gasson Hall 301 by FB
MATH1121 Section 08 Tuesday at 4:00 - 4:50 pm in	Gasson Hall 302 by FB

Common evening midterm exams[1] Thursday 6:00 - 7:30 pm in TBD on
September 20, October 25, November 29

Common final exam[2] on Friday, December 14 at 4:00 pm.

Thursday evening 6:00 - 7:30 pm meeting time will be used for **additional workshops** on weeks when there are not midterm exams. Attendance is optional but recommended. Workshops will be held in Cushing Hall 001.

Instructor: Baris Coskunuzer, coskunuz@bc.edu Office: Maloney 532,
https://www2.bc.edu/baris-coskunuzer Office Hours: Mo 10 – 11:30am Tu 12:30 – 2pm

Teaching Assistants:

Martha McAlister-Raeburn, mcalisma@bc.edu Office: Maloney 537, Off Hours: Mo 2-3 , Tu 3-4
Fraser Malcolm Watt Binns, binnsf@bc.edu Office: Maloney 537, Off Hours: Tu 11-12 & 2-3

Course Website: All assignments, grades, official communication, and supplementary course documents are posted on Canvas. Log in to Canvas by visiting bostoncollege.instructure.com or from the "My Courses" section of Agora Portal. Use your BC username and password.

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[1] Make-up exams given by arrangement if deemed necessary. Contact ellen.goldstein@bc.edu *at least two weeks prior to exam date.* See Make-Up Exam policies below.

[2] Exam date and time determined by BC's office of student services. See http://www.bc.edu/offices/stserv/academic/current/exams.html for more details, including FAQ.

Required Course Materials:

WebAssign online homework and learning platform with access to Stewart, James. *Single Variable Calculus: Early Transcendentals*, 8th Edition. Cengage Learning. Note: all students have free temporary access through September 10, 2018.

Purchasing information:

- You are *not* required to purchase a print version of the book. You *are* required to have access to WebAssign, which comes with access to the eBook.
- Cengage Unlimited, a subscription service providing access to *all* Cengage ebooks and digital learning products (over 22,000) for $119.99 per term (extended subscriptions[3] also available). One Cengage Unlimited subscription can be used across all courses where Cengage products are assigned, at no additional cost. You can purchase access to Cengage Unlimited in the BC bookstore, or at www.cengage.com. Option for additional print rental[4] ($7.99 + free shipping).
- Bundled loose-leaf text with WebAssign access code for $171.75. ISBN 9780357008034. Available at the BC bookstore, or at www.cengage.com.
- Do *not* buy a used copy of the text unless you plan to buy access to WebAssign separately. Third-party sellers (e.g. Amazon) *cannot* guarantee valid access codes with used course materials.

Calculators: Calculators are *not* allowed on quizzes and exams. You are not required to have a calculator for this course, however some homework problems require the use of a calculator or computer to assist with arithmetic.

Tutoring: There are many resources on campus for additional instruction. Walk-in tutoring is available in the Math Department in Maloney Hall, Room 536, typically between 10am and 3pm. Precise schedule posted outside the Math Department office. The Connors Family Learning Center www.bc.edu/libraries/help/tutoring.html on the second floor of O'Neill Library provides free tutoring during the semester. Call 617-552-0611 to schedule an appointment. The Math Department office maintains a list of tutors-for-hire who have indicated their availability for the term.

Prerequisites: High school algebra including trigonometry and exponential and logarithmic functions. No previous experience in calculus is necessary. *MATH1100 is not open to students who have completed a calculus course at the college level.*

Description: MATH1100 is a first course in the calculus of one variable intended for biology, computer science, economics, management, and premedical students. It is open to others who are qualified and desire a more rigorous mathematics course at the core level. Satisfies Core requirement for Mathematics. *Students contemplating majors in Chemistry, Computer Science/B.S., Environmental Geosciences,*

[3] You will automatically have access to WebAssign for MATH1101 Calculus II in Spring 2019 as it is the continuation of MATH1100. However, your subscription will not extend to cover other courses using Cengage products. If you will need access to multiple Cengage texts both semesters, the full-year subscription for $179.99 may be a better option for you.

[4] Print rental is per semester.

Geological Sciences, Mathematics, or Physics should enroll in MATH1102. For more information about choosing the appropriate calculus course for your needs, visit www.bc.edu/bc-web/schools/mcas/departments/math/undergraduate/about-calculus.html.

What is Calculus?

> *"To explain all nature is too difficult a task for any one person or for even any one age. 'Tis much better to do a little with certainty and leave the rest for others that come after you."*
> *- Isaac Newton, one of the founders of Calculus*

Mathematics is one of the key tools developed by humans to explore, explain, and predict the natural world. Calculus is the mathematical study of change, in the same way that geometry is the study of shape, probability is the study of chance, and algebra is the study of operations and their application to solving equations. "[Calculus] has two major branches, differential calculus (concerning rates of change and slopes of curves), and integral calculus (concerning accumulation of quantities and the areas under and between curves); these two branches are related to each other by the fundamental theorem of calculus. Both branches make use of the fundamental notions of convergence of infinite sequences and infinite series to a well-defined limit. Generally considered to have been founded in the 17th century by Isaac Newton and Gottfried Leibniz, today calculus has widespread uses in science, engineering and economics and can solve many problems that algebra alone cannot."[5]

> *"Mathematics compares the most diverse phenomena and discovers the secret analogies that unite them."* *- Joseph Fourier, 18th Century Mathematician*

Why learn calculus? Calculus is used in every branch of the physical sciences, actuarial science, computer science, statistics, engineering, economics, business, medicine, demography, and in other fields wherever a problem can be mathematically modeled and an optimal solution is desired. A "mathematical model" means a function or set of equations used to describe quantities, represented by variables. By using abstract models, mathematicians develop theories that apply to many different types of problems that share the same underlying ideas. The idea of rate of change is everywhere, from the study of motion, to growth and decline of populations, to price and demand in economics, and to decay laws in medicine for a particular drug's leaving the body.

Learning Objectives:

- **Problem Solve** Become proficient and flexible in the conceptual and computational aspects of problem-solving with calculus (how to approach a problem, how to solve, how to interpret answers)
- **Apply Mathematics** Use the tools of calculus to model and/or analyze phenomena in different disciplines, such as Economics and Life Sciences
- **Communicate** Be able to explain the reasoning and concepts behind the computational tools and theorems you use, using pictures and words
- **Be Resilient** Develop strategies and support networks to help tackle difficult problems**.** Learn to stick with a hard problem through frustration to the eventual "ah-ha" moment.

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[5] http://en.wikipedia.org/wiki/Calculus

Topics:

- A review of functions and their inverses (Chapter 1 Sections 1, 5).[6]
- Limits (Chapter 2 Sections 1-3, 5-8, Chapter 4 Section 4).
- Derivatives (Chapter 2 Sections 1, 7, 8, Chapter 3 Sections 1-6).
- Applications of Differentiation (Chapter 3 Sections 7-10, Chapter 4 Sections 1-5, 7, 8).
- Antiderivatives (Chapter 4 Section 9).

Grades:

The weighting scheme below will be used to determine your course grade at the end of the semester. No extra credit or alternate assessment plan will be offered except as necessitated by long-term illness, disability, or family emergency. Such situations will be evaluated by the course coordinator in cooperation with the dean's office on a case-by-case basis. No special accommodations will be given to any student except those specified by the Connors Family Learning Center or the Disability Services Office (see Disabilities below).

Attendance	3%
Quizzes	7%
Written Homework	10%
Online Homework (WebAssign)	10%
Lowest Midterm Exam	11%
Other two Midterm Exams	17% each
Final Exam	25%

Attendance: Students are expected to attend *all* required class meetings, including discussions sections. Only the Thursday evening workshops are optional. Arrive on time. If you must leave early, notify the instructor at the start of class and seat yourself so as to cause as little disturbance as possible. Chronic absenteeism will have a detrimental effect on your learning and may require your withdrawal from the course. Your attendance grade will be calculated as the ratio of classes you attend to the total number of classes during the semester, less any excused absences. If you cannot attend class due to documented illness or other personal circumstance, you are responsible for contacting your instructor and providing documentation *in a timely manner*. Appropriate documentation means a note from a doctor, University Health/Counseling Services, or dean.

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[6] Chapter 1 Sections 2-4 and Appendices A, B, and D are considered prerequisite material and will be used throughout the semester. Students requiring a more thorough review should attend Thursday evening workshops. Students who have not previously learned these topics should email the course coordinator at ellen.goldstein@bc.edu to discuss switching to a combined precalculus/calculus course.

Quizzes: You will typically have one quiz per week. These will test your retention of definitions, formulas, theorems, and examples presented in class.[7] They are closed book, closed notes, no calculator allowed. *No quiz makeups will be given.* If you are absent for a reason deemed as excused, you will be excused from the quiz. Quizzes will be graded heuristically with either a ✓ (satisfactory), ✓- (unsatisfactory), or ✓+ (exceptional). ✓ and ✓+ will receive full credit; ✓- will receive 80% credit; quizzes neither taken nor excused will be assigned a score of 0. ***Your two lowest quiz score will be dropped.***

Written Homework: Exact assignments will be posted on Canvas and due approximately once per week. Written homework will consist of harder problems meant to *deepen and expand* your understanding of material covered in class. Solutions to problems will be posted on Canvas at 5pm on the due date, so *no late homework will be accepted* after this deadline. Contact your instructor *in advance* if you will be unable to complete your homework on time due to documented illness or other personal circumstance. If you are unable to attend class, you may send your homework with a classmate or otherwise arrange its submission to your instructor. The majority of homework is graded on correctness, though the occasional problem may be graded on completeness. ***Your two lowest homework score will be dropped.***

Online Homework (WebAssign): Problems from each section covered in the text will be assigned and due two or three times per week. Online homework will consist of more routine computational problems meant to test your retention and understanding of the basic ideas covered in class. You will receive immediate feedback and may resubmit answers until the assignment deadline. Contact your instructor *in advance* if you will be unable to complete an assignment on time due to documented illness or other personal circumstances. ***Your three lowest WebAssign scores will be dropped.***
To enroll to our Webassign section, please use the following class key: **bc 7417 2941**

Midterm Exams: There will be three *evening* midterm exams (see Required Course Meetings above for precise dates and times). These will test your understanding and retention of material covered in class and on homework, as well as your ability to apply your knowledge to novel scenarios. One double-sided page (8.5x11") of notes allowed, no calculators. Per the above grading policy, your lowest midterm exam score will have less effect on your grade than your higher two exam scores. If you are ever suddenly too unwell to take an exam, email your instructor and the course coordinator at ellen.goldstein@bc.edu immediately (see emergency reasons for missing an exam below). *Once you begin an exam, you may not be excused except in cases of sudden illness.* Your score will be recorded if you sat the exam, even if you feel that you did not perform to the best of your abilities.

Make-Up Exams: Without prior permission, an absence from an exam will earn a zero except in cases of illness or emergency. *Both your instructor and the course coordinator must receive notification of emergent situations, supported in a timely manner by documentation from a doctor, university Health/Counseling Services, or dean.* If you are unable to attend an evening midterm exam for a *significant* foreseeable reason, you may take a make-up exam earlier in the day. Prior approval from the course

[7] See www.psychologicalscience.org/observer/test-enhanced-learning-2 for research supporting the use of low-stakes testing in aiding long-term memory retention. Also www.retrievalpractice.org.

coordinator, obtained at least **two weeks prior** to a midterm exam, is required in order to miss an exam for a non-emergency reason. Email ellen.goldstein@bc.edu.

Student athletes who are required to travel to tournaments on exam days should have their academic advisor through LRSA contact the course coordinator at ellen.goldstein@bc.edu. You will be required to complete a make-up exam *prior* to leaving campus for your tournament.

Final Exam: The final exam will be cumulative, including all material covered during the semester. One double-sided page (8.5x11") of notes allowed, no calculators. Final exams are scheduled by the Office of Student Services. Permission to take a final exam at an alternate time requires approval from the dean's office. This course has a common final exam, so follows the Common Exam Schedule instead of the usual final exam schedule. Per university policy,[8] students who have more than two exams scheduled on Friday, December 14, may take the make-up exam on Wednesday, December 19, at 4:00 pm. *Warning: this is a very late date! Check your exam schedule to see if you have to take the make-up exam and make your travel plans accordingly!*

Policies:

Academic Integrity: Any work with your name on it is presumed to be your own and not copied from another person, the internet, or a textbook. Copying solutions from either the textbook or a another person and submitting them as your own is plagiarism and is an infringement of the Academic Integrity Policy. Any infringement of the Academic Integrity Policy is taken very seriously and reported to the dean. You can read more about the policy at www.bc.edu/integrity. If you have questions about what constitutes appropriate collaboration vs. plagiarism, contact your instructor or the course coordinator at ellen.goldstein@bc.edu.

Disabilities: If you are a student with a documented disability seeking reasonable accommodations in this course, please contact Kathy Dugan, 617-552-8093, dugganka@bc.edu, at the Connors Family Learning Center regarding learning disabilities and ADHD, or Paulette Durrett, 617-552-3470, paulette.durrett@bc.edu, in the Disability Services Office regarding all other types of disabilities, including temporary disabilities. *Advance notice* and appropriate documentation are required for accommodations. Students are responsible for arranging accommodations before each midterm exam and the final exam.

Financial Assistance: If you need support to buy course materials, please contact the Montserrat Office at montserrat.coalition@bc.edu or contact the course coordinator at ellen.goldstein@bc.edu. You can learn more about the Montserrat Coalition at www.bc.edu/offices/mission/montserrat.html.

Confidentiality: The Family Educational Rights and Privacy Act (FERPA) prohibits instructors from sharing any information about your grades, with the exception of specific instances. See www.ed.gov for complete details. In particular, educational information cannot be shared with a parent or guardian of a student attending a school beyond the high school level without explicit permission in writing from the student.

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[8] See http://www.bc.edu/offices/stserv/academic/current/exams.html.