MATH 1342 SECTION 12 (FALL 2020)
CALCULUS 2 FOR SCIENCE AND ENGINEERING

Instructor:	Robert Chang
Office:	534 Nightingale Hall
Email:	hs.chang@northeastern.edu
Office Hours:	MW 10:40–11:40 a.m., T 2:30–3:30 p.m., and by appointment; see Canvas for up-to-date information

Website:	Canvas at Northeastern
Lecture:	MWR 9:15–10:20 a.m. at 106 Hastings Suite; Zoom live stream and recording available on Canvas

TA:	Ian Dumais
Email:	dumais.i@northeastern.edu
Office Hours:	TBA
Recitations:	TBA

Course description and learning outcomes. This course covers techniques of integration, improper integrals, polynomial approximations of functions, power series representations of functions, sequences, convergence tests for series, the dot product and orthogonal projections in Euclidean space and the cross product in three space. Applications include distance traveled in space, volume, mass and density, work, and equations for lines and hyperplanes in space.

- Find indefinite integrals by selecting and using techniques of integration;
- Find power series approximations of a function with error bounds;
- Apply tests for convergence to determine if a series of numbers converges;
- Find the interval of convergence for a power series;
- Compute volumes and mass;
- Find the angle between vectors in space;
- Find equations of lines and hyperplanes in space;
- Clearly present their reasoning and the steps in their solutions to problems.

Textbooks. Two textbooks are used: *Worldwide Integral Calculus with infinite series* and *Worldwide Multivariable Calculus* by David B. Massey. PDF and printed versions are available at `www.centerofmath.org/store/`. You are not required to purchase a printed textbook. The PDF has hyperlinked tables of contents, indices, and cross-references.

The PDF also contains links at the beginning of each section to online full-length, free, video lectures on the contents of that section. These videos can also be accessed by going to `https://www.youtube.com/user/CenterofMath/`. In addition, the PDF textbook has links to videos of solutions for selected exercises. If there is a discrepancy between how the videos present material and how your instructor

presents material, you should follow your instructor's presentation, but you should discuss the matter with your instructor.

Required assignments and grade breakdown. Check Canvas for the most up-to-date information.

- **Homework (26%)**
  Ten homework sets are planned for the semester. Late submissions are not accepted; the lowest homework grade is dropped.

- **Two midterm exams (22% + 22%)**
  Two 65-minute exams are scheduled for October 8 and November 12. Make-up tests are given only in situations outlined by the university. Students should discuss anticipated excused absence(s) with the instructor at least two weeks in advance or within 24 hours of unforeseen events such as illness or emergency (see sick note policy).

- **Final Exam (30%)**
  A two-hour final exam is administered some time between December 11 and December 18. See Final Exam Conflicts section below.

09/07	Labor Day (no class)		10/26	Appdendex A: Vectors
09/09	§ 1.1 Recalling derivatives		10/28	§ 3.3 Arc length
09/10	§ 1.1 Integration by parts		10/29	§ 3.5 Volume
09/14	§ 1.3 Partial fractions		11/02	§ 3.5 Volume
09/16	§ 2.5 Improper integrals		11/04	§ 3.7 Mass and density
09/17	§ 2.6 Numerical techniques		11/05	§ 3.9 Work and energy
09/21	§ 5.1 Sequences		11/09	Review
09/23	§ 5.2 Series		11/11	Veteran's Day (no class)
09/24	§ 5.3 Nonnegative series		11/12	Exam 2
09/28	§ 5.4 Alternating series		11/16	§ 1.1 Euclidean space
09/30	§ 5.4 Alternating series		11/18	§ 1.2 Vector space $\mathbb{R}^n$
10/01	§ 4.1 Approximating polynomial		11/19	§ 1.3 Dot product and angles
10/05	§ 4.2 Taylor polynomials		11/23	§ 1.4 Lines and planes
10/07	Review		11/25	Thanksgiving (no class)
10/08	Exam 1		11/26	Thanksgiving (no class)
10/12	Columbus Day (no class)		11/30	§ 1.5 Cross product
10/14	§ 4.3 Error in approximation		12/02	Review
10/15	§ 4.4 Functions as power series		12/03	Review
10/19	§ 4.5 Power series as functions		12/07	Review
10/21	§ 4.6 Power series as functions		12/09	Review
10/22	§ 3.1 Displacement and distance		12/10	Reading day (no class)

Final exams during December 11–18.

Academic Integrity and Honesty. Academic dishonesty is not tolerated and results in a failing grade. All incidents are reported to the Office of Student Conduct and Conflict Resolution (OSCCR). See here for detailed policies.

Academic Resources. The following resources are free for NEU students.

- YouTube playlists for integral and multivariable calculus.
- Tutoring for calculus is provided by the College of Engineering.
- The Peer Tutoring Center, located at 1 Meserve Hall, offers a wide range of tutoring services, which are free and open to all NEU undergraduate students. Tutoring begins the second week of classes and ends the last day of classes. If you need academic assistance, contact the Peer Tutoring Program Monday through Friday from 9:00 to 5:30 by calling 617- 373-8931, emailing `peertutoring@northeastern.edu`, or visiting their website.
- The International Tutoring Center (ITC) provides NEU international students with free, comprehensive English language and academic support. The ITC includes English as a Second Language Tutoring (ESL), Language and Culture Workshops, and Reading Workshops. For more information on available workshops and tutoring opportunities please visit their website.

Attendance. Attendance is expected. The course moves very fast; it is possible to fall behind in a single day. If you miss class for any reason, make an immediate attempt to contact the instructor or another student to discuss what you missed and how to catch up. It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class. Students are responsible for all information given when they are absent.

College of Science Policies. See College of Science Academic Course Policies.

Final Exam Conflicts. Only two finals at the same time or three in one day constitute a University recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a Final Exam Conflict Form, available on the Registrar's website. Missing the final exam results in a failing grade.

NUflex. Hybrid NUflex classes offer a great deal of flexibility because they can be accessed remotely as well as on-ground. Unlike in online classes, however, students enrolled in Hybrid NUflex classes should expect to meet in their scheduled class sequences. Students should expect to spend time on preparation, synchronous class attendance, and assignments.

Inclusion and Diversity. I value all students regardless of their background, country of origin, race, religion, gender, sexual orientation, ethnicity, or disability status, and am committed to providing a climate of excellence and inclusiveness within all aspects of the course. If there are aspects of your culture or identity that you would like to share with me as they relate to your success in this class, I would be happy to discuss these with you. Should you have any concerns in this area or

are facing any special issues or challenges, I encourage you to discuss the matter with me as you feel comfortable, with assurance of full confidentiality (the only exception being mandatory reporting of NEU Academic Integrity Policy violations and Title IX sex and gender discrimination).

Letter Grades. Letter grades are determined by the percentage grade as follows:

$$100 \geq \text{A} > 92, \quad 92 \geq \text{A-} > 89, \quad 89 \geq \text{B+} > 86, \quad 86 \geq \text{B} > 82,$$
$$82 \geq \text{B-} > 79, \quad 79 \geq \text{C+} > 76, \quad 76 \geq \text{C} > 72, \quad 72 \geq \text{C-} > 69,$$
$$69 \geq \text{D+} > 66, \quad 66 \geq \text{D} > 62, \quad 62 \geq \text{D-} > 59, \quad 59 \geq \text{F} \geq 0.$$

Reporting Concerns. If you have a concern about the course or the instructor that is not or cannot be resolved by speaking with the instructor, the next step is to speak with the Course Coordinator, Professor Richard Porter (r.porter@ northeastern.edu). If the Course Coordinator does not settle the matter, please contact the Teaching Director, Professor Alex Martsinkovsky (a.martsinkovsky@ northeastern.edu).

Resources During COVID-19. Northeastern's Response to COVID-19: Reopening Northeastern, updates from the University, resources for students.

Snell Library. Snell Library offers a variety of resources for undergraduate research, including subject-specific Research Guides, help with citation and bibliography, and 24/7 chat support. The library also houses the Digital Media Commons, which offers a variety of resources for multimedia projects.

TRACE Participation. Every student is expected to complete the Teacher Rating and Course Evaluation (TRACE) survey at the end of the semester.

Withdrawal and Incomplete. Withdrawal must be done through the Registrar by the announced deadline. Last day to drop without a W grade is September 29; with a W grade, December 10. Instructors are only permitted to give Incomplete under very limited circumstances. The student must have completed at least 75% of the course material and must have a C or better grade at the time.

Students with Disabilities. Students who have disabilities who wish to receive academic services and accommodations should follow the standard Disabilities Resource Center (DRC) procedures.

Title IX. The University strictly prohibits sex or gender discrimination in all university programs and activities. Information on reporting an incident of such discrimination (including sexual harassment and sexual assault) is located here.

WeCare. WeCare offers supports for students during times of difficulty or challenge. You can find WeCare at 226 Curry Student center Monday to Friday 8:30-5-:00, call at 617-373-7591, or email wecare@northeastern.edu.