MATH221001 Linear Algebra (3 Credits)
Boston College Summer Session 2018
Summer Session 2, June 25 – August 3
Lectures: MWTh, 4 – 6:15pm

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Boston College Mission Statement
Strengthened by more than a century and a half of dedication to academic excellence, Boston College commits itself to the highest standards of teaching and research in undergraduate, graduate and professional programs and to the pursuit of a just society through its own accomplishments, the work of its faculty and staff, and the achievements of its graduates. It seeks both to advance its place among the nation's finest universities and to bring to the company of its distinguished peers and to contemporary society the richness of the Catholic intellectual ideal of a mutually illuminating relationship between religious faith and free intellectual inquiry.

Boston College draws inspiration for its academic societal mission from its distinctive religious tradition. As a Catholic and Jesuit university, it is rooted in a world view that encounters God in all creation and through all human activity, especially in the search for truth in every discipline, in the desire to learn, and in the call to live justly together. In this spirit, the University regards the contribution of different religious traditions and value systems as essential to the fullness of its intellectual life and to the continuous development of its distinctive intellectual heritage.

Course Description
This course is an introduction to the techniques of linear algebra in Euclidean space. Topics covered include matrices, determinants, systems of linear equations, vectors in n-dimensional space, complex numbers, and eigenvalues. The course is required of mathematics majors and minors, but is also suitable for students in the social sciences, natural sciences, and management.

Textbooks & Readings (Required)
We will be following Linear Algebra: A Modern Introduction, 4th edition, by David Poole. However, you do not need to purchase a hardcopy of the text.

Each student is required to purchase an access code to WebAssign, which is an online course system that we will be using for homework. WebAssign includes access to the eBook version of the textbook at no additional charge, so you do not need to buy a hardcopy of the textbook. If you want to have a physical copy of the text, then you should purchase the text + WebAssign bundle from the bookstore on campus.
Canvas
Canvas is the Learning Management System (LMS) at Boston College, designed to help faculty and students share ideas, collaborate on assignments, discuss course readings and materials, submit assignments, and much more - all online. As a Boston College student, you should familiarize yourself with this important tool. For more information and training resources for using Canvas, click here.

Course Objectives
1. In successfully completing this course, students will master the basic techniques linear algebra. This will be demonstrated by successfully completing homework assignments as well as in-class exam performance.
2. Students are expected to be able to apply these techniques to a variety of applied problems involving topics such as linear models in business and science; computer graphics; computation of volumes.
3. The student will demonstrate an appreciation for linear algebra across cultural settings and will learn the impact of culture, gender, and age in applications of linear algebra as demonstrated by response to examples used in class.
4. The student will demonstrate ethical appreciation pertaining to the mastery of linear algebra as demonstrated by completing their work independently.

Grading
Students’ grades will be based on the weighted average of homework and exam scores according to this formula: 20% homework, 40% in-class exams (20% each) and 40% final exam. Final (letter) grades will be assigned on the basis of the class distribution of averages, with minor adjustments made as appropriate.

The undergraduate grading system for Summer Session is as follows:

A (4.00), A- (3.67)
B+ (3.33), B (3.00), B- (2.67)
C+ (2.33), C (2.00), C- (1.67)
D+ (1.33), D (1.00), D- (.67)
F (.00)

The graduate grading system for Summer Session is as follows:

A (4.00), A- (3.67)
B+ (3.33), B (3.00)
B- (2.67), passing but does not count toward degree
C (2.00), passing but not for degree credit
F (.00)

All students can access final grades through Agora after the grading deadline each semester. Transcripts are available through the Office of Student Services.

Deadlines and Late Work
Assignments have firm deadlines; late homework will not be accepted.

Course Assignments
It is expected that you will spend 8 hours per week on out-of-class assignments and exercises. These will be assigned online through WebAssign. Please note that some weeks will require more time and some weeks less time but the average is approximately 8 hours per week over the semester.
Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Sections</th>
<th>Topics</th>
</tr>
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<tbody>
<tr>
<td>Mon, 06/25</td>
<td>1.1, 1.2</td>
<td>Vectors, vector algebra, length, dot product</td>
</tr>
<tr>
<td>Wed, 06/27</td>
<td>1.3, 1.4</td>
<td>Lines and planes, applications</td>
</tr>
<tr>
<td>Thu, 06/28</td>
<td>2.1, 2.2</td>
<td>Systems of linear equations and their solutions</td>
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<tr>
<td>Mon, 07/02</td>
<td>2.3, 2.4</td>
<td>Linear independence, spanning sets, applications</td>
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<tr>
<td>Wed, 07/04</td>
<td></td>
<td>Holiday: No classes</td>
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<tr>
<td>Thu, 07/05</td>
<td></td>
<td><strong>Midterm Exam 1</strong></td>
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<tr>
<td>Mon, 07/09</td>
<td>3.1, 3.2</td>
<td>Matrices, matrix operations, matrix algebra</td>
</tr>
<tr>
<td>Wed, 07/11</td>
<td>3.2, 3.3</td>
<td>Matrix inverses</td>
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<tr>
<td>Thu, 07/12</td>
<td>3.3, 3.4</td>
<td>LU Factorization</td>
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<tr>
<td>Mon, 07/16</td>
<td>3.5</td>
<td>Subspaces, bases, dimension, rank</td>
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<tr>
<td>Wed, 07/18</td>
<td>3.6, 3.7</td>
<td>Linear transformations, applications</td>
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<td>Thu, 07/19</td>
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<td><strong>Midterm Exam 2</strong></td>
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<tr>
<td>Mon, 07/23</td>
<td>4.1, 4.2</td>
<td>Eigenvalues, eigenvectors, determinants</td>
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<tr>
<td>Wed, 07/25</td>
<td>4.2, 4.3</td>
<td>Eigenvalues, eigenvectors, determinants</td>
</tr>
<tr>
<td>Thu, 07/26</td>
<td>4.4, 4.6</td>
<td>Similarity, diagonalization, applications</td>
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<tr>
<td>Mon, 07/30</td>
<td>5.1, 5.2</td>
<td>Orthogonality, complements and projections</td>
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<td>Wed, 08/01</td>
<td></td>
<td>Review</td>
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<tr>
<td>Thu, 08/02</td>
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<td><strong>Final Exam</strong></td>
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Written Work

Summer Session students are expected to prepare professional, polished written work. Written materials must be typed and submitted in the format required by your instructor. Strive for a thorough yet concise style. Cite literature appropriately, using APA, MLA or CLA style per your instructor’s requirements. Develop your thoughts fully, clearly, logically and specifically. Proofread all materials to ensure the use of proper grammar, punctuation and spelling. For writing support, please contact the Connors Family Learning Center.

Attendance

Attending class is an important component of learning. Students are expected to attend all class sessions. When circumstances prevent a student from attending class, the student is responsible for contacting the instructor before the class meets. Students who miss class are still expected to complete all assignments and meet all deadlines. Many instructors grade for participation; if you miss class, you cannot make up participation points associated with that class. Makeup work may be assigned at the discretion of the instructor. If circumstances necessitate excessive absence from class, the student should consider withdrawing from the class.

Consistent with BC’s commitment to creating a learning environment that is respectful of persons of differing backgrounds, we believe that every reasonable effort should be made to allow members of the university community to observe their religious holidays without jeopardizing their academic status. Students are responsible for reviewing course syllabi as soon as possible, and for communicating with the instructor promptly regarding any possible conflicts with observed religious holidays. Students are responsible for completing all class requirements for days missed due to conflicts with religious holidays.
Accommodation and Accessibility
Boston College is committed to providing accommodations to students, faculty, staff and visitors with disabilities. Specific documentation from the appropriate office is required for students seeking accommodation in Summer Session courses. Advanced notice and formal registration with the appropriate office is required to facilitate this process. There are two separate offices at BC that coordinate services for students with disabilities:

- The Connors Family Learning Center (CFLC) coordinates services for students with LD and ADHD.
- The Disabilities Services Office (DSO) coordinates services for all other disabilities.

Find out more about BC’s commitment to accessibility at www.bc.edu/sites/accessibility.

Scholarship and Academic Integrity
Students in Summer Session courses must produce original work and cite references appropriately. Failure to cite references is plagiarism. Academic dishonesty includes, but is not necessarily limited to, plagiarism, fabrication, facilitating academic dishonesty, cheating on exams or assignments, or submitting the same material or substantially similar material to meet the requirements of more than one course without seeking permission of all instructors concerned. Scholastic misconduct may also involve, but is not necessarily limited to, acts that violate the rights of other students, such as depriving another student of course materials or interfering with another student’s work. Please see the Boston College policy on academic integrity for more information.