MATH 231-04: Linear Algebra (Course # 43701) - Course Syllabus – Fall 2020

Instructor: Professor Pastore
Lectures: **Monday/Wednesday, 1:40 pm – 3:30 pm (Online via Zoom or Google Meet)**
Email: jpastore@qc.cuny.edu
Virtual Office Hours: Thursdays 11 am – 12 noon

General Information: This is a first course in Linear Algebra, a branch of mathematics that focuses on the study of vector spaces and linear transformations. The course will contain both theoretical and computational aspects of matrices and linear algebra as a whole. Topics will include, but not be limited to, systems of linear equations, vector spaces and their algebraic properties, linear independence/span/basis, eigenvalues/eigenvectors, orthogonality, linear transformations and isomorphism.

Student Expectations and Requirements:

Each student is required and expected to:

- Be an active participant in all areas of the course
- Have the technological skill-set to independently use *multiple online platforms* for accessing course content and submitting course work (including Google Classroom)
- Check Queens College email, Google Classroom posts, and/or Blackboard announcements multiple times per week.

Required Academic and Technological Materials:

- **Required Textbook**: **Elementary Linear Algebra, 11th Edition; Howard Anton, ISBN 978-1-118-47350-4**
- Texas Instruments Graphing Utility **(TI-83/84 only - All other models are not permitted for use). Students must have an actual TI-83/84 graphing device. For example, computer or cell-phone emulators are not permitted for use during exams.**
- A computer/laptop/tablet and a working video camera and microphone for the for the purpose of accessing/joining Zoom and/or Google Meet for the duration of the course
- Continuous access to a stable, highspeed WiFi/Internet connection
- An app or document scanner for creating PDF files
- **A contingency plan in the event of technological failures**

Synchronous/Asynchronous Attendance

- Attendance during live sessions is required, and all students should appear on camera. Live video sessions will take place using either *Zoom* or *Google Meet.*
- Recorded video lectures will be created periodically and posted for asynchronous study. Video lectures will be assigned through *Google Classroom* and *EdPuzzle.*

Homework

- A homework assignment will be posted in correspondence with each course lecture
- For the purposes of exam preparation, your goal should be to write clear/detailed, concise, and logical solutions when solving homework problems. Emphasis should be placed on correct use of mathematical symbols and notation, as well as proper grammar and proper use of course terminology/vocabulary.
- Students may randomly be asked to submit handwritten solutions of homework assignments. Late submissions will not be accepted.
- Successful completion of all homework assignments is necessary in order to master the course topics. Mastery of course topics is necessary in order to have success on course exams.

Course Grades: The final course grade will be determined using the following assessments:

- Two problem-sets (pre and post-midterm); (Asynchronous activities) – (30% of the course grade)
- Midterm Exam (Synchronous activity) – (30% of the course grade)
- Final Exam (Synchronous activity) – (40% of the course grade)

The official date and time of each exam will be announced by the instructor with sufficient notice.

Note: A summary of assessment and exam policies and procedures will be provided prior to the first assessment and exam, respectively. Course exams and assessments must be completed and/or submitted the day and time at which they are scheduled to be administered or submitted. Make-up exams/assessments will not be given in place of any missed exam/assessment, and a score of 0 may be assigned.

Blackboard: All students must have access to Blackboard since it will be used to post course assignments and communicate important information to students enrolled in the class via announcements/email. In order to access Blackboard, you may visit the CUNY Portal at www.cuny.edu .

Personal Conduct: Students are expected to respect the rights and privileges of class members and the instructor. Any disruptive or inappropriate behavior that compromises the instructor's ability to teach, the learning environment, or the safety of others will not be tolerated and will be reported to the Office of Judicial Affairs and Office of Student Services.

Note (1): All students should appear on camera for synchronous course activities, and therefore should be appropriately dressed and aware of their surroundings while on camera.

Note (2): Use of inappropriate language of any kind will not be tolerated. Please use discretion when speaking on live video sessions or typing messages/text into chat-boxes or other electronic mediums. Please keep in mind: The virtual classroom is not your social media account or your personal text/chat session.

Note (3): Live video sessions will not be recorded, and it is not permissible for students to record any live video sessions.

Note (4): Students may not, at any time, take unsolicited pictures or screenshots of the class members or the instructor.

Academic Integrity: Students are required to submit their coursework in an honest manner. Suspicion of academic dishonesty may result in the disqualification of one or more course assessments or exams.

Faculty members are required to report any suspected or confirmed incidents of academic dishonesty to the Office of Judicial Affairs. For more information regarding academic integrity, please visit the university website using the URL below.

https://www.cuny.edu/about/administration/offices/legal-affairs/policies-procedures/academic-integrity-policy/

Americans with Disabilities Act: If you have a physical, psychological, medical, or learning disability that may impact your coursework, please contact the Office of Special Services for Students with Disabilities (Frese Hall – Room 111). They will help determine what accommodations are necessary and/or appropriate. It is the responsibility of the student to inform the instructor of any such accommodations.

General Outline of MATH 231 Course Topics

- **Systems of Linear Equations (1.1)**
- **Gaussian Elimination (1.2)**
- **Matrices & Matrix Operations (1.3)**
- **Inverses and Algebra of Matrices (1.4)**
- **Elementary Matrices, Finding Inverses (1.5 & 1.6)**
- **Diagonal/Triangular/Symmetric Matrices (1.7)**
- **Matrix Transformations (1.8)**

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- **Determinants and their properties (2.1, 2.2, 2.3)**

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- **Vectors in two and three dimensions (3.1)**
- **Geometry of Linear Systems (3.4)**

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- **Real Vector Spaces (4.1)**
- **Subspaces (4.2)**
- **Linear Independence (4.3)**
- **Coordinates and Basis (4.4)**
- **Dimension (4.5)**
- **Row/Column/Null Space (4.7)**
- **Rank, Nullity (4.8)**
- **Real Matrix Transformations (4.9, 4.10)**

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- **Eigenvalues & Eigenvectors (5.1)**
- **Diagonalization (5.2)**

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- **Norm, Dot Product, and Distance (3.2)**
- **Orthogonality (3.3)**
- **Inner Products, Gram-Schmidt, QR decomposition (6.1, 6.2, 6.3)**

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- **General Linear Transformations, Isomorphism, Similarity (8.1,8.2,8.3,8.4)**

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Optional Topics

- **Orthogonal Matrices, Orthogonal Diagonalization (7.1, 7.2)**
- **Change of Basis Matrices (4.6)**