MAT 242: Linear Algebra

Instructor: S. Nikitin
Email: nikitin@asu.edu

Homework site: http://webwork.asu.edu
Web site: http://www.public.asu.edu/~nikitin/

Office: WXLR 436
Office Hours: Tue. 9:40-10:40 am

The instructor reserves the right to make changes to this syllabus as necessary.
Any such changes will be announced in class and updated in the online syllabus.

ASU Catalog Description: Linear equations, matrices, determinants, vector spaces, bases, linear transformations and similarity, inner product spaces, eigenvectors, orthonormal bases, diagonalization, and principal axes.

Enroll requirements: Pre-requisites: MAT 267 or 272 with C or better; Credit is allowed for only MAT 342 or 343

Class Location and time: Tempe WXLR A108, 8:35 AM - 9:30 AM

Course Materials: All information necessary for the course will be presented in class and also posted at http://www.public.asu.edu/~nikitin
For the references you can use, for example, the following.
http://joshua.smcvt.edu/linearalgebra/book.pdf
http://linear.ups.edu/fcla/front-matter.html

Calculators that perform symbolic algebra, such as TI-89, TI Nspire CAS, Casio FX2, Casio 9970Gs, cannot be used.

Lecture Schedule:

<table>
<thead>
<tr>
<th>Week of:</th>
<th>sections</th>
<th>Week of:</th>
<th>sections</th>
<th>Week of:</th>
<th>sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 15</td>
<td>1</td>
<td>May 29</td>
<td>4, 5</td>
<td>June 12</td>
<td>Canonical forms</td>
</tr>
<tr>
<td>May 22</td>
<td>2, 4</td>
<td>June 5</td>
<td>6, 7</td>
<td>June 19</td>
<td>2nd order surfaces, Diff. Eq.</td>
</tr>
<tr>
<td>May 30</td>
<td>Exam 1</td>
<td>June 12</td>
<td>Exam 2</td>
<td>June 26</td>
<td>Final exam</td>
</tr>
</tbody>
</table>

University Holidays (no classes, exams): Memorial Day: Monday, June 25.

Grade Components:

<table>
<thead>
<tr>
<th>Homework</th>
<th>10%</th>
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</thead>
<tbody>
<tr>
<td>Exams (2 midterms + final)</td>
<td>90% (30 % each)</td>
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</tbody>
</table>

Grading Scale: This course utilizes +/- grading. Grading policy is posted at

http://www.public.asu.edu/~nikitin/grading/index.html

A+ = [>100);   A = [90,100);   A- = [88,90);   B = [80,88);   B- = [78,80);   C = [68,78);
D = [59,68);   E = [0,59);
The grade percentage is calculated as

\[(\text{Test}_1 + \text{Test}_2 + \text{Work in class} + \text{Final exam} + \text{WebWork}/3) \times 0.2\]

where \(\text{Test}_1 = \text{Test}_2 = \text{Final exam} = \text{WebWork} = 150.\)

**Section Topics:**

<table>
<thead>
<tr>
<th></th>
<th>Systems of linear equations, matrix algebra.</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>Determinant, Cramer's rule.</td>
</tr>
<tr>
<td>4</td>
<td>Linear space, linear dependence/independence, basis, row and column space</td>
</tr>
<tr>
<td>5</td>
<td>Scalar product, orthogonal subspaces, orthonormal set, the Gram-Schmidt process</td>
</tr>
<tr>
<td>6</td>
<td>Eigenvalues, eigenvectors, canonical forms</td>
</tr>
<tr>
<td>7</td>
<td>Linear transformations, Matrix of transformations</td>
</tr>
<tr>
<td></td>
<td>Canonical forms</td>
</tr>
<tr>
<td></td>
<td><a href="https://math.la.asu.edu/~nikitin/1stCourseLinAlg/chapter6/chapter.html">https://math.la.asu.edu/~nikitin/1stCourseLinAlg/chapter6/chapter.html</a></td>
</tr>
<tr>
<td></td>
<td>2nd order curves and surfaces</td>
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<tr>
<td></td>
<td><a href="https://math.la.asu.edu/~nikitin/1stCourseLinAlg/chapter7/node1.html">https://math.la.asu.edu/~nikitin/1stCourseLinAlg/chapter7/node1.html</a></td>
</tr>
</tbody>
</table>

**Homework:** Practice problems are assigned through WebWork software found at [http://webwork.asu.edu](http://webwork.asu.edu). The due dates for this work are listed on the site. You may work ahead on any of these assignments, but no due date extensions will be given.
Extra Credit:

Course attendance and active participation in the class work are strongly advised. One can earn extra credit, 1% of the total grade, for each correctly solved problem followed by its public presentation in the class. Challenge problems assigned in class are due on the respective next Exam, each challenge problem is 1% of the total grade if it is solved correctly. No partial credit is awarded for take home challenge problems. It is either 1% of the grade or nothing.

Make up Exams: Make up exams are given at the discretion of the instructor and only in the case of verified medical or other documented emergencies. Students should notify the instructor before the exam is given if possible. Call the Undergraduate Math Office (480) 965-3951 and leave a message or directly notify the instructor via email. If the event is not an emergency, the instructor must be notified in advance to request a make up. The instructor is not required to accommodate you.

Technology Usage Policy: Any student who accesses a phone or any internet-capable device during a quiz or exam for any reason automatically receives a score of zero on the assessment. All such devices must be turned off and put away during quizzes and exams.

Attendance Policy:
- Attendance is mandatory and will be taken daily. Be on time. If you miss attendance, you are absent.
- A maximum of 4 unexcused absences is allowed for classes meeting twice per week.
- The only “excused” absences are those for university-sanctioned activities, jury duty, military obligations, or religious observances. (In other words, the 4 permitted unexcused absences are to allow for illness and emergency.) Students with an excused absence may make arrangements to make up missed class work.
- Students who exceed the permitted number of absences will receive a grade of EN.

Class Expectations
- Come to class on time with notes and a calculator
- Ask questions or come to office hours if you’d like further explanation or examples
- Review your notes daily to prepare for quizzes and upcoming tests
- Read the text in advance to prepare for the next day’s new material
- Leave cell phones, laptops, and other electronics off and put away while in the classroom

Student Resources
- Free Tutoring: The Math Tutoring Centers in WXLR 116 and BAC 16 are open Monday through Friday, and are free for ASU students taking 100-200 level math courses. Bring your Sun Card. See website for hours.
- Student Success Centers: (http://studentsuccess.asu.edu) provides counseling, tutoring in math (and many other subjects), supplemental instruction, and other types of support to students. See the website for more information.

Please come see me during office hours if you have any questions or concerns, or if you are registered with DRC and will require accommodations in this class.
For semester deadlines related to enrollment, withdrawal or payments, see the academic calendar available at http://students.asu.edu/academic-calendar

Course Withdrawal: A student who has not already received an EN grade may withdraw from a course with a grade of W during the withdrawal period. The instructor’s signature is not required. It is a student’s responsibility to verify that they have in fact withdrawn from a class.

The grade of Incomplete: A grade of incomplete will be awarded only in the event that a documented emergency or illness prevents the student who is doing acceptable work (C or better) from completing a small percentage of the course requirements. The guidelines in the current general ASU catalog regarding a grade of incomplete will be strictly followed.

Instructor-Initiated Drop: At the instructor’s discretion, any student who has not attended class during the first week of classes may be administratively dropped from the course. However, students should be aware that non-attendance will NOT automatically result in their being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student’s responsibility to be aware of their registration status.

Final Exam Make-up Policy: The final exam schedule listed in the Schedule of Classes will be strictly followed. Exceptions to the schedule and requests for make-up final examinations can be granted only by the Department Chair, Associate Department Chair, or the Director of First Year Mathematics, and for one of the following reasons:
1. Religious conflict (e.g., the student celebrates the Sabbath on Saturday)
2. The student has more than three exams scheduled on the same day as the math final
3. There is a time conflict between the math final and another final exam.

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see http://provost.asu.edu/academicintegrity.

The grade of XE: A grade of XE is reserved for "failure for academic dishonesty.” The XE grade may be petitioned after 1 year.

Ethics: It's highly unethical to bring to your instructor’s attention the possible impact of your mathematics grade on your future plans, including graduation, scholarships, jobs, etc. For the university’s complete policy regarding ethics, including cheating, plagiarism and other forms of academic dishonesty, see the Student Academic Integrity Policy at the following web address: http://provost.asu.edu/academicintegrity

Student Conduct Statement: Students are required to adhere to the behavior standards of the Arizona Board of Regents Policy Manual Code of Conduct, Academic Affairs Manual ACD 125 Computer, Internet, and Electronic Communications, and the ASU Student Academic Integrity Policy. Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student’s behavior disrupts the educational process according to procedures of the Student Services Manual SSM 201-10.