

## **MATH 260, Linear Systems and Matrices, Fall '14**

### **Midterm Study Goals**

This is a list of learning goals you should be able to demonstrate that you have achieved on the midterm. This is not necessarily a complete list of all topics the midterm could cover, but it's close. All topics for the midterm will be pulled from the reading (sections 3.1-3.4 of the book), the videos, the homework and activities.

1. Be able to perform basic matrix-scalar operations (such as matrix addition, matrix multiplication, etc.).
2. Be able to transpose a matrix.
3. Be able to convert from a system of equations to a (augmented) matrix, and back.
4. Be able to perform elementary row operations on a matrix.
5. Be able to identify row echelon form (REF), and be able to manipulate a matrix to be in REF.
6. Be able to identify reduced row echelon form (RREF) and manipulate a matrix to be in RREF.
7. Be able to state the number of solutions (and find them) to a system, based on its RREF.
8. Be able to tell what the rank of a matrix is.
9. Know what the implications of a square matrix not having full rank are.
10. Be able to find the inverse of a matrix.
11. Be able to identify several characteristics of an invertible matrix.
12. Be able to state the number of solutions to a matrix-vector equation, based on invertibility.
13. Be able to determine when a matrix has no inverse.
14. Be able to find the determinant of a matrix (up to  $4 \times 4$ , but understand how it would work beyond).
15. Be able to find the 'minor' and 'cofactor' of elements in a matrix.
16. Discover several properties of determinants including if a matrix has an inverse.