**Department of Aerospace Engineering**

**AE602 Mathematics for Aerospace Engineers**

**Assignment No. 3**

**3.1** From find a formula for . Do the same from

**3.2** If the inverse of is , show that the inverse of is . (Thus is invertible whenever is invertible.)

**3.3** Use the Gauss-Jordan method to invert

**3.4** Find the inverses (in any legal way) of

**3.5** Show that for any square matrix is always symmetric and is always *skew-symmetric*—which means that Find these matrices when and write as the sum of a symmetric matrix and a skew-symmetric matrix.

**3.6** Under what conditions on its entries is invertible, if

 or

**3.7** Compute the symmetric factorization of

 And

**3.8** Find the inverse of

**3.9** Which descriptions are correct? The solutions of

form a plane, line, point, subspace, nullspace of column space of

**3.10** Compute an factorization for

Determine a set of basic variables and a set of free variables, and find the general solution to What is the rank of

**3.11** For the matrix

Determine the echelon from the basic variables, the free variables and the general solution to Then apply elimination to with components and on the right side; find the conditions for to be consistent (that is, to have a solution) and the general solution. What is the rank of

**3.12** Carry out the same steps, with on the right side, for the transposed matrix

**3.13** (a) Find all solutions to

(b) If the right side is changed from what are the solutions?