Schedule for Linear Algebra (2014) BSc in Robotics, 1st Semester Aalborg University

We will go through the following material from [SIF] L.E. Spence, A.J. Insel, S.H. Friedberg, "Elementary Linear Algebra: A Matrix Approach, 2nd Edition, Pearson, Prentice Hall, 2008.

- **1.session, 4th September** Introduction to vectors and matrices: 1.1, 6.1 p. 361-366, on pp. 364 365 only the theorems. 1.2 till p.19.
- 2.session, 16th September Matrixvectorproduct systems of linear equations: 1.2 from p. 19, 1.3
- **3.session, 18th September** Gauss-elimination. Span. 1.4 og 1.6
- 4.session, 7th October Linear independence 1.7
- **5.session**, **9th October** Miniproject 1.(Solve systems of linear equations using MatLab)
- **6.session, 14th October** Linear transformations and matrices. 2.7. 2.8 til s. 185 mid. (In general about functions (Injective, surjective bijective), Appendix B)
- 7.session, 16th October Matrix multiplication, composition of linear transformations. 2.1 og 2.8 p.185 mid, till 187
- 8.session, 23rd October Invertible matrices and invertible linear transformations. 2.3, 2.4 og 2.8 p.187-188
- 9.session, 28th October Determinants. 3.1 og 3.2 till p. 217 l.9.
- **10.session, 30th October** Miniproject 2 (0-1 matrices, Kirchoff's law)
- 11.session, 4th November Subspaces, basis for subspaces. 4.1 og 4.2 till p.245, mid.
- 12.session, 6th November Dimension, Rank and nullity. the remaining part of 4.2, 4.3
- 13.session, 11th November Coordinate systems. 4.4
- 14.session, 13th November Linear transformations and coordinate systems. 4.5
- 15.session, 18th November Eigenvectors and og eigenvalues. 5.1 og 5.2 till p. 307
- 16.session, 20th November Diagonalization. 5.3
- **17.session**, **25th November** Miniproject 3 (Systems of differential equations, 5.5)
- 18.session, 27th November Orthogonality, Gram Schmidt, QR-faktorisation. 6.2
- 19.session, 2nd December Ortogonal projection. 6.3.
- 20.session, 4th December Ortogonal matrices Ortogonal transformations in the plane. 6.5 til s. 419
- **21.session, 9th December** Miniproject 4 (Method of least squares, 6.4)
- 22.session, 11th December Rigid motion. 6.5 p.419-421