

CLO for Linear Algebra, Math 44600/A4600

Course Learning Outcomes Please describe below all learning outcomes of the course, and indicate the letter(s) of the corresponding Departmental Learning Outcome(s).

After taking this course, the student should be able to:

1. (e1, e2, f, g) Write clear and rigorous proofs (or disproofs) of mathematical statements utilizing basic proof techniques
2. (e1, f, g) Understand basic definitions and properties of finite dimensional Hilbert spaces over the real and complex numbers
3. (e1, e2, f, g) State and sketch proof of the spectral theorem for self-adjoint operators, rank-nullity theorem, Cayley-Hamilton theorem
4. (a, c, d, e1, e2) Compute various matrix decompositions such as LU, QR and SVD and understand their relevance to applications
5. (a, c, d) Understand applications of linear algebra to one or more of the following: error-correcting codes, principal component analysis, linear programming, the Fast Fourier Transform

Departmental Learning Outcomes The mathematics department, in its varied courses, aims to teach students to:

- (a) perform numeric and symbolic computations
- (b) construct and apply symbolic and graphical representations of functions
- (c) model real-life problems mathematically
- (d) use technology appropriately to analyze mathematical problems
- (e) state (e1) and apply (e2) mathematical definitions and theorems
- (f) prove fundamental theorems
- (g) construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.