

**Math 3144: Linear Algebra I**  
**Spring 2024**

*Last revised June 25, 2024*

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<b>Text:</b>	<i>Linear Algebra Done Right</i> (4 <sup>th</sup> Ed.) by Sheldon Axler PDF access via VT Library <a href="https://virginiatech.on.worldcat.org/oclc/1406837723">https://virginiatech.on.worldcat.org/oclc/1406837723</a> or the author's website <a href="https://linear.axler.net/">https://linear.axler.net/</a>		
<b>Canvas:</b>	<a href="https://canvas.vt.edu/courses/187635">https://canvas.vt.edu/courses/187635</a>		

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**Course Content and Delivery:**

This is an introductory rigorous course in linear algebra, and students are expected to write proofs. Math 3144 covers general finite dimensional vector spaces, dual spaces, linear transformations, algorithms for solving systems of linear equations, determinants, eigenvector/eigenvalue problems, inner product spaces, and related theory. This is an *in-person course* and your instructor has no intention of recording video lectures.

*Per Math Department policy, no other specifics of this course policy sheet may be made publicly available.*

## Tentative Schedule

- Week 1** M.L.K. Junior Day  
§1B - Definition of a Vector Space  
§1C - Subspaces
- Week 2** §2A - Span and Linear Independence  
§2B - Bases
- Week 3** §2B - Bases  
§2C - Dimension  
§3A - The Vector Space of Linear Maps
- Week 4** §3A - The Vector Space of Linear Maps  
§3B - Null Spaces/Kernels and Ranges
- Week 5** Exam 1 Review  
Exam 1
- Week 6** §3C - Matrices  
§3D - Invertibility and Isomorphisms
- Week 7** §3D - Invertibility and Isomorphisms  
Supplementary - Proofs of Reduced Row Echelon Form and Gauss–Jordan Elimination  
§5A - Invariant Subspaces
- Week 8** Spring Break
- Week 9** §5A - Invariant Subspaces  
§5B - The Minimal Polynomial  
§5D - Diagonalizable Operators
- Week 10** §5D - Diagonalizable Operators  
§9A - Bilinear Forms and Quadratic Forms
- Week 11** Exam 2 Review  
Exam 2
- Week 12** §9A - Bilinear Forms and Quadratic Forms  
§9B - Alternating Multilinear Forms
- Week 13** §9B - Alternating Multilinear Forms  
§9C - Determinants
- Week 14** §9C - Determinants
- Week 15** §9C - Determinants  
Supplementary - Proof of Laplace’s Cofactor Expansion

§9D - Tensor Products (*the world's briefest introduction*)

**Week 16** Final Exam Review