

Mathematics 313

Honours Linear Algebra II

(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Invariant subspaces, diagonalization and triangulation, direct-sum decompositions.	8
Rational and Jordan canonical forms.	8
Inner products, inner product spaces, orthogonalization, adjoints, unitary and normal operators.	8
Spectral theory.	8
SVD. Quadratic forms.	4
TOTAL HOURS	36

Math 313 – Honours Linear Algebra II

Course Outcomes

This course is a continuation of Math 213 (Honours Linear Algebra I). We shall build upon the knowledge and skills acquired in Math 213 to learn about further topics in linear algebra. This course requires students to reason abstractly, provide proofs of mathematical statements, and work with precise definitions. Specifically, by the end of this course, students will be able to:

1. Explore the relationship between key linear algebra concepts and their geometric representation.
2. Seek to apply linear algebra techniques to a variety of practical problems.
3. Read and create proofs of mathematical statements about topics covered in the course.

Subject specific knowledge.

By the end of this course, students will be fluent in the abstract theory of linear algebra. Specifically, by the end of this course, students will be able to

4. State all of the technical definitions covered in the course.
5. State all of the relevant theorems covered in the course.
6. Use these definitions and theorems from memory to construct solutions to problems and/or proofs.
7. Verify that an abstract mathematical object satisfies a given definition, or is a counterexample.
8. Determine the rational and Jordan canonical forms of a matrix.

* * * * *