

Mathematics 9 – Syllabus

Multi-variable calculus with linear algebra

October 29, 2018

| Lecture | Sections | Topic |
|------------------|---|---|
| Sept 12 (W) | Stewart 12.1 | Intro to Course; 3-d coordinate system and distance |
| Sept 14 (F) | Stewart 12.2 (not p.842) | Vectors |
| Sept 17 (M) | Linear Algebra 1.1-1.3 | Linear combinations and spanning sets, Linear independence and bases |
| Sept 19 (W) | Linear algebra 1.4 | Vector equations of lines and planes. |
| Sept 20 (X-hour) | Linear algebra 1.5 | Determinants |
| Sept 21 (F) | Stewart 12.3 | Dot products and orthogonality |
| Sept 24 (M) | Stewart 12.3–12.4, (Recommended Active Calculus 9.3.3-9.3.5) | Projections and work, Cross products |
| Sept 26 (W) | Stewart 12.5 | Scalar equations of lines and planes |
| Sept 28 (F) | Stewart 13.1, begin 13.2 | Vector functions, space curves |
| Oct 1 (M) | Stewart 13.2 (continued), 13.3 up through Example 2, 13.4 up through page 915 (not Kepler's laws) | Derivatives and integrals of vector functions, velocity and acceleration, arclength |

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| Oct 3 (W) | Stewart 12.1-12.5, Stewart 13.1-13.4 Linear algebra Chapter 1 | Review |
| Oct 4 (X-hour) | | Review, Q+A |
| Oct 5 (F) | 3:30–5:30 pm | Midterm I in 008 Kemeny |
| Oct 5 (F) | Linear Algebra 2.1; Begin Stewart 14.1 | Matrix operations, Functions of Several Variables |
| Oct 8 (M) | Stewart 14.1 | Functions in several variables, level sets |
| Oct 10 (W) | Stewart 14.2 | Limits of Functions in several variables |
| Oct 11 (Th) | Stewart 14.3 | Partial derivatives |
| Oct 12 (F) | Direction Derivatives 3.1 | Direction Derivatives |
| Oct 15 (M) | Linear Algebra 2.2-2.3 | Linear transformations and their representing matrices |
| Oct 17 (W) | Linear Algebra 2.4-2.5 | Linearity properties/Geometry of linear transformations |
| Oct 18 (Th) | Linear algebra 2.5 | Rotations |
| Oct 19 (F) | Linear algebra 2.6, 3.2 | Composition of functions, Tangent planes. |
| Oct 22 (M) | Linear algebra 3.3 | Derivatives as matrices (I) |
| Oct 24 (W) | Review | |
| Oct 26 (F) | 3:30–5:30 pm | Midterm II in 008 Kemeny |
| Oct 26 (F) | Linear algebra 3.4 | Derivatives as matrices (II) |
| Oct 29 (M) | Stewart 14.6, starting at bottom of page 989; Linear Algebra 3.5 | Gradients, Maximizing directional derivatives, tangents to level sets (if time) |

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| Oct 31 (W) | Stewart 14.6; Linear Algebra 3.5 | chain rule, finish tangents to level sets |
| Oct 1 (Th) | Linear Algebra 2.8, parts of 3.7 if time | quadratic forms, second order directional derivatives |
| Nov 2 (F) | Stewart 14.7 | Max/Min of functions in 3 variables |
| Nov 5 (M) | Stewart 14.7 | Max/Min of functions in 3 variables |
| Nov 7 (W) | Stewart 14.8 | Lagrange multipliers |
| Nov 9 (F) | Stewart 14.8 | Lagrange multipliers |
| Nov 12 (M) (Last day of class) | | Review |
| Nov 16 (F) | 11:30 AM | Final Exam |