This exam covers:

- Functions of multiple variables: interpreting verbal, graphical, numerical, formulaic descriptions, points and surfaces in 3-space, linear functions of multiple variables, limits/continuity (Ch 12)
- Vectors: basic geometric and algebraic descriptions, dot product, projections, cross product, equation of plane using normal vector (Ch 13)
- Differentiation of multivariable functions: first and second-order partial derivatives, local linearity, the differential, directional derivatives, the gradient, the chain rule (14.1-14.7)

Formulas to know:

- Equation of plane from point and slopes
- Equation of plane from point and normal vector
- Dot product, projections
- Cross product
- The differential
- The gradient and directional derivatives

Format of the exam:

- Most problems will be similar to homework problems.
- Calculators will not be permitted; numerical computations will be amenable to hand calculation, at least in my opinion.
- Several questions will test your understanding of the concepts underlying the tools and techniques we have discussed.

Exercises for review:

- Ch 12 Review: 1, 2, 4-7, 9-12, 14, 15,16, 17-19, 20, 21-23, 38, 39, 40, 42-44
- Ch 13 Review: 1-6, 10-17, 20-22, 23, 24-31, 34-35, 38, 41, 43-44, 45, 46, 47, 48-51, 52, 59
- Ch 14 Review: 1-63, 64, 66, 67, 71, 73, 74, 82, 83, 87, 88, 90, 92, 98, 99, 105, 108, 110, 111
- Section 14.6: 1-17