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, priority in bold:

- Ch 12 Review: 1, 2, 4-7, 9-12, 14, 15, **16**, 17-19, **20**, 21-23, 34, 38, **39**, **40**, **42-44**
- Ch 13 Review: 1-6, 10-17, 20-22, **23**, 24-31, **32-34**, 38, **41**, 43-44, **45**, 46, 47, 48-51, **52**, 54, 59
- Ch 14 Review: 1-63, **64**, **66**, 67, 71, 73, **74**, 82, 83, **87**, 88, 90, 92, 98, **99**, 105, 108, **110**, **111**