

## Syllabus & Textbook Homework for Math 251

- ☒ The text is the first edition of Rogawski's *Calculus Early Transcendentals*, W.H. Freeman, 2008, ISBN-10: 0-7167-7267-1.
- ☒ CALCULATOR: A graphing calculator is required for this course. No calculators will be permitted in the midterms and the final exam.
- ☒ Grade distribution: Two midterms 200 pts, final 200 pts, Homework 10 pts, Quizzes 40 pts, Maple Labs 50 pts (total 500 pts).
- ☒ Office hours: Thursday 1:00-3:00 am. Office: 528 Hill Center. Email: [rong@math.rutgers.edu](mailto:rong@math.rutgers.edu)
- ☒ Final exam: December 16 (Wednesday), 8:00-11:00 pm .

### Syllabus and suggested textbook homework problems for 640:251

Lecture	Topic(s) and text sections	Suggested problems
9. 2	12.1 Vectors in the Plane 12.2 Vectors in Three Dimensions	12.1: 5, 9, 11, 15, 21, 40, 47 12.2: 11, 13, 19, 25, 27, 31, 51
9. 8	12.3 Dot Product and the Angle Between Two Vectors 12.4 The Cross Product	12.3: 1, 13, 21, 29, 31, 52, 57, 63 12.4: 1, 5, 13, 20, 25, 26, 43, 44
9. 9	12.5 Planes in Three-Space	12.5: 1, 9, 11, 15, 25, 31, 53
9. 14	13.1 Vector-Valued Functions 13.2 Calculus of Vector-Valued Functions	13.1: 5, 13, 15, 18 13.2: 4, 14, 30, 31, 33, 41, 49
9. 16	13.3 Arc Length and Speed 13.4 Curvature 13.5 Motion in Three-Space	13.3: 3, 9, 13, 14 13.4: 1, 7, 17, 21 13.5: 3, 6, 32
9. 21	14.1 Functions of Two or More Variables 14.2 Limits and Continuity in Several Variables	14.1: 7, 20, 23, 27, 36, 40 14.2: 5, 15, 27, 35
9. 23	14.3 Partial Derivatives 14.4 Differentiability, Linear Approximation and Tangent Planes	14.3: 3, 19, 21, 39, 47, 50, 53 14.4: 3, 4, 7, 15, 27, 33
9. 28	14.5 The Gradient and Directional Derivatives	14.5: 7, 13, 27, 31, 33, 37, 39, 43
9. 30	14.6 The Chain Rule	14.6: 1, 5, 7, 17, 20, 23, 27,

		30
10. 5	14.7 Optimization in Several Variables	14.7: 1, 3, 7, 17, 19, 24, 25, 27, 29
10. 7	14.8 Lagrange Multipliers: Optimizing with a Constraint	14.8: 2, 7, 11, 13, 15
10. 12	Exam 1, October 12th	
10. 14	15.1 Integration in Several Variables	15.1: 10, 15, 23, 25, 33, 37, 44
10. 19	15.2 Double Integrals over More General Regions	15.2: 3, 5, 11, 25, 32, 37, 43, 45, 49, 59
10. 21	15.3 Triple Integrals	15.3: 3, 5, 11, 15, 17, 25, 33
10. 26	12.7 Cylindrical and Spherical Coordinates	12.7: 1, 5, 23, 31, 41, 43, 48, 53
10. 28	15.4 Integration in Polar, Cylindrical, and Spherical Coordinates	15.4: 1, 5, 9, 19, 23, 27, 31, 37, 39, 42, 47, 51, 59
11. 2	15.5 Change of Variables	15.5: 1, 5, 14, 15, 21, 29, 33, 37
11. 4	16.1 Vector Fields	16.1: 1, 3, 10, 17, 23, 27
1. 9	16.2 Line Integrals	16.2: 3, 9, 13, 21, 27, 35, 39, 40
11. 11	16.3 Conservative Vector Fields	16.3: 1, 5, 9, 13, 17, 19, 21
11. 16	Exam 2, November 16th	
11. 18	16.4 Parameterized Surfaces and Surface Integrals	16.4: 1, 5, 8, 11, 19, 21, 37
11. 23	16.5 Surface Integrals of Vector Fields	16.5: 1, 6, 9, 12, 15, 17, 23
11. 25	17.1 Green's Theorem	17.1: 1, 3, 6, 9, 12, 23, 27
11. 30	17.2 Stokes' Theorem	17.2: 1, 5, 9, 11, 19, 23
12. 2	17.3 Divergence Theorem	17.3: 1, 5, 7, 11, 14, 15, 18
12. 7	Catch up & review; possible discussion of some applications of vector analysis.	

### Maple labs and

#### workshops

The course has four suggested Maple labs during the standard semester, in addition to a Maple lab 0 which is introductory and should be discussed in the first week or two. Instructors may also wish to assign some workshop problems so that students can continue to improve their skills in technical writing.