

Syllabus for MATH 154 – Calculus II

Objectives

This course is continuation of Calculus I and it aims to provide more insight to advanced mathematical techniques in engineering. Topics covered are: Functions of several variables, partial derivatives, free and constrained extrema. Tangent plane, extreme values, method of Lagrange multipliers, Multiple integrals and applications, cylindrical and spherical coordinates. Sequences, improper integrals, infinite series of constants, power series and Taylor's series with applications. **Prerequisite: MATH 153.**

Textbook

“Calculus, A Complete Course” by Robert A. Adams, 7th Edition, Addison Wesley.

References

“Calculus, Early Transcendentals” by Howard Anton, Irl Bivens, Stephen Davis, Eighth Edition, Wiley.

Grading

Exam	Ratio
Midterm I	25%
Midterm II	25%
Final Exam	40%
Quizzes	10%

Course Content

1. Sequences and Convergence, Infinite Series, Convergence Tests for Positive Series,
2. Absolute and Conditional Convergence. Power Series,
3. Taylor and Maclaurin Series, Applications of Taylor and Maclaurin Series,
4. Functions of Several Variables, Limits and continuity, Partial Derivatives,
5. Gradients and Directional Derivatives,
6. Extreme Values, Extreme Values of Functions Defined on Restricted Domains,
7. Lagrange Multipliers,
8. Iteration of Double Integrals in Cartesian Coordinates, Polar Coordinates in Double integrals,
9. Triple Integrals, Change of Variables in Triple Integrals,
10. Applications Using Maple *
11. Classifying Differential Equations, Solving First-Order Equations,
12. Second Order Linear Differential Equations with Constant Coefficients,
13. Differential Equations of Second Order (17.4).
14. Linear Differential Equations with Constant Coefficients.

*** Applications by Using Maple**

1. Infinite Series, Three-Dimensional Graphing.
2. Partial Derivatives.
3. Double and Multiple Integrals.
4. Gradient, Divergence.
5. Solving Differential Equations with dsolve.

Rules

Attendance is an essential requirement of this course and is the responsibility of the student. Class begins promptly and you are expected to be present at the beginning and at the end of each class session.

Notes

Homework problems are the best preparation for exams. You should try to work the homework problems without constant reference to the text or passively receiving help from others. We encourage discussing problems with others, but you should try to do the actual problems yourself. If you have gotten the idea about how to solve a problem from another person or by looking things up in the text, try to do a related problem without outside aid.

* The content of this syllabus can be changed by the instructor at any time by informing the related department's head.

* The student is supposed to be aware of the facts and notices written in this syllabus.