



University at Buffalo

Department of Mathematics

Office of Undergraduate Studies

233 Mathematics Building

E-mail: math-undergrad@buffalo.edu

Ph: (716) 645-8785

SAMPLE SYLLABUS

This document is published only as an indication of what is typically taught in this course.

Instructors have the responsibility of deciding on the topics to be omitted, additional topics to be included, and the emphasis, ordering, and pacing of presentation of topics.

MTH 139: College Calculus 2B

Number of Course Credits: 2

Course Description

This half-semester course comprises the second half of MTH 142. MTH 138 and MTH 139 together are equivalent to MTH 142.

Required Text(s) & Materials

Calculus: Early Transcendentals, Ninth Edition, James Stewart, Daniel Clegg, Saleem Watson.

Prerequisites

MTH 138 with a recommended grade of C or higher.

Notes

This course covers the second half of the material of MTH 142. Topics of MTH 139 include infinite sequences; series and power series; additional topics in analytic geometry.

Learning Outcomes

| Outcome (Student will be able to...) | Method of Assessment |
|---|---|
| <ul style="list-style-type: none"> - Compute the length of a curve segment from its Cartesian or parametric representation - Describe curves and regions of the xy-plane in polar coordinates - Interpret the concept of a series as the sum of a sequence, and use the sequence of partial sums to determine convergence of a series - Determine whether an infinite series is convergent or divergent using appropriate series test(s). | <p>HW 1, 2, 3 Exam 1</p> |
| <ul style="list-style-type: none"> - Interpret a converging power series as a function and find its interval of convergence and radius of convergence - Compute the derivatives and antiderivatives of a functions represented by power series - Manipulate Taylor series by substitution and (anti-)differentiation to obtain expansions for other functions | <p>HW 4, 5, 6 Exam 2</p> |
| <ul style="list-style-type: none"> - Choose appropriate methods or models for a given problem, using information from observation or knowledge of the system being studied. | <p>HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2</p> |
| <ul style="list-style-type: none"> - Employ quantitative methods, mathematical models, statistics, and/or logic to analyze data and solve real-world problems beyond the level of basic algebra. | <p>HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2</p> |
| <ul style="list-style-type: none"> - Identify common mistakes and/or limitations in a.) empirical and/or deductive reasoning, and b.) mathematical, quantitative, and/or logical problem solving. | <p>HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2</p> |
| <ul style="list-style-type: none"> - Interpret mathematical models, formulas, graphs, and/or tables, to draw inferences from them, and explain these inferences. | <p>HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2</p> |

Course Schedule

| Week | Sections | Topics | Exams |
|------|------------------|---|--------|
| 1 | 10.1,10.2, 10.3 | Curves defined by parametric equations. Calculus with parametric curves. Polar coordinates. | |
| 2 | 11.1, 11.2 | Sequences. Series. | |
| 3 | 11.3, 11.4, 11.5 | The integral test & Estimates of Sums. The comparison tests. Alternating series. | |
| 4 | 11.5, 11.6, 11.7 | Absolute convergence. The ratio and root tests. Strategy for testing series. | Exam 1 |
| 5 | 11.8, 11.9 | Power series. Representation of functions as power series. | |
| 6 | 11.9, 11.10 | Representation of functions as power series. Taylor & Maclaurin series. | |
| 7 | 11.10, 11.11 | Taylor & Maclaurin series. Applications of Taylor polynomials. | Exam 2 |

Exam Schedule

| Date | Subject |
|--------|---------|
| Week 4 | Exam 1 |
| Week 7 | Exam 2 |