

Course Outline for MATH 1263, Bridge Calculus II

MATH 1263 Bridge Calculus II (2 units)

Prerequisite: Appropriate Math Placement.

Sequences and series, Taylor polynomials. Vectors, the dot product, the cross product, equations of lines and planes. Intended for students with a 4 or a 5 on the AP Calculus BC exam. Not open to students with credit in MATH 143, [MATH 1262](#), or [MATH 1265](#). An appropriate AP Calculus BC score and Math 1263 is equivalent to Math 1261 and Math 1262. 2 lectures.

Course Learning Objectives

1	Determine whether a sequence or an infinite series converges or diverges.
2	Determine the radius and interval of convergence of a power series.
3	Find Taylor series of functions and use them to compute limits, derivatives, and antiderivatives, and to approximate functions with a bound on error.
4	Compute the dot product and cross product of vectors and use these products to solve elementary problems in geometry.
5	Solve problems involving lines and planes in space.

Expanded Course Content

Textbooks, materials, and/or other resources

Calculus: Early Transcendentals, 9th Edition, by James Stewart, Daniel K. Clegg, Saleem Watson

Week	Readings	Topics of Discussion
1	Section 11.1	Sequences, convergence of sequences, Monotone Convergence Theorem
2	Section 11.2	Definition of an infinite series, geometric series, telescoping series, properties of series
3	Section 11.3	The integral test, p-series
4	Section 11.4	The Comparison Test, the Limit Comparison Test
5	Section 11.5	Alternating series, the Alternating Series Test, the Alternating Series Estimation Theorem
6	Section 11.6	Absolute versus conditional convergence of series, the Ratio Test, the Root Test
7	Section 11.7	Strategy for testing series, review

Week	Readings	Topics of Discussion
8	Section 11.8	Definition and properties of a power series, radius and interval of convergence of a power series
9	Section 11.9	Representations of functions as power series, differentiation and integration of power series
10	Section 11.10	Taylor and Maclaurin series, Taylor's Inequality
11	Section 11.11	Applications of Taylor polynomials, approximating functions by Taylor polynomials with a bound on error
12	Sections 12.1, 12.2	Three-dimensional coordinate systems, vectors, addition and scalar multiplication of vectors, properties of vectors
13	Section 12.3	Definition and properties of the dot product, scalar and vector projections
14	Section 12.4	Definition and properties of the cross product, applications in geometry
15	Section 12.5	Vector and parametric equations of lines, equations of planes, applications in geometry

Method of Assessment

The possible methods of assessment are written individual examinations, quizzes, in-class worksheets or presentations, projects, and homework. All exams are to be proctored in-person, and one or more midterms and a cumulative final exam are required.

Instructional Mode

The instructional mode for this class is face-to-face. This designation means that the essential academic standards of the course require in-class student engagement, and thus remote instruction is not appropriate.