**MATH 1B Course Outline as of Fall 2014**

# CATALOG INFORMATION

Dept and Nbr: MATH 1B Title: CALCULUS 2
Full Title: Calculus, Second Course
Last Reviewed: 9/14/2020

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---|---|---|---|---|---|---|
| Maximum | 5.00 | Lecture Scheduled | 5.00 | 17.5 | Lecture Scheduled | 87.50 |
| Minimum | 5.00 | Lab Scheduled | 0 | 8 | Lab Scheduled | 0 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 5.00 | | Contact Total | 87.50 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 175.00 Total Student Learning Hours: 262.50

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|---|---|
| Title 5 Category: | AA Degree Applicable |
| Grading: | Grade Only |
| Repeatability: | 00 - Two Repeats if Grade was D, F, NC, or NP |
| Also Listed As: | |
| Formerly: | |

**Catalog Description:**
Topics include methods of integration, conic sections, polar coordinates, infinite sequences and series, parametric equations, solid analytic geometry, and vectors.

**Prerequisites/Corequisites:**
MATH 1A or higher (VF)

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**
Description: Topics include methods of integration, conic sections, polar coordinates, infinite sequences and series, parametric equations, solid analytic geometry, and vectors. (Grade Only)
Prerequisites/Corequisites: MATH 1A or higher (VF)
Recommended:
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

## ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

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|---|---|---|---|---|
| **AS Degree:** | **Area** | | Effective: | Inactive: |
| | B | Communication and Analytical Thinking | Fall 1981 | |
| | MC | Math Competency | | |
| **CSU GE:** | **Transfer Area** | | Effective: | Inactive: |
| | B4 | Math/Quantitative Reasoning | Fall 1981 | |
| **IGETC:** | **Transfer Area** | | Effective: | Inactive: |
| | 2A | Mathematical Concepts & Quantitative Reasoning | Fall 1981 | |

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| **CSU Transfer:** | Transferable | Effective: | Fall 1981 | Inactive: |
| **UC Transfer:** | Transferable | Effective: | Fall 1981 | Inactive: |

**CID:**

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| CID Descriptor:MATH 900S | Single Variable Calculus Sequence |
| SRJC Equivalent Course(s): | MATH1A AND MATH1B |
| CID Descriptor:MATH 230 | Multivariable Calculus |
| SRJC Equivalent Course(s): | MATH1B AND MATH1C |

**Certificate/Major Applicable:**
Major Applicable Course

## COURSE CONTENT

**Outcomes and Objectives:**
Upon completion of the course, students will be able to:
1. Apply methods of integration, including integration by parts, integrals of inverse functions, trigonometric substitutions and partial fractions, to calculate proper and improper integrals.
2. Define and discuss conic sections as equations, as geometric intersections and as loci.
3. Apply differentiation and integration to parametric representations of graphs, including polar graphs.
4. Use three dimensional rectangular coordinates.
5. Determine convergence of sequences and series.
6. Compute power series of functions, their derivatives and integrals.
7. Compute Taylor and Maclaurin series and demonstrate applications to elementary functions.
8. Determine radii and intervals of convergence of power series.
9. Compute and use determinants, dot products, cross products, and projections.
10. Determine lines and planes in space.
11. Describe velocity and acceleration of particles in the plane and in space using vector functions.

**Topics and Scope:**

I. Integration
   A. Integration by parts
   B. Integration of inverse functions
   C. Trigonometric integrals

D. Trigonometric substitutions
E. Partial fractions
F. Improper integrals
G. Area of surfaces of revolution

II. Topics From Plane Analytic Geometry
A. Conic sections
B. Polar coordinates and graphs

III. Infinite Series
A. Sequences and series
B. Convergence tests
C. Power series
D. Radii and intervals of convergence
E. Taylor polynomials and approximations
F. Derivatives and integrals of power series
G. Taylor and Maclaurin series

IV. Parametric Equations
A. Tangents, arc length and areas
B. Tangents and area for polar graphs

V. Topics from Solid Analytic Geometry
A. Rectangular coordinate system
B. Quadric surfaces

VI. Vectors
A. Vectors in the plane and in space
B. Determinants
C. Dot and cross products
D. Projections
E. Lines and planes in space
F. Differentiation and integration of vector valued functions
G. Velocity and acceleration
H. Tangent and normal vectors
I. Curvature

**Assignment:**

1. Daily reading outside of class (20-50 pages per week).
2. Problem set assignments from required text(s) or supplementary materials chosen by the instructor (1-6 per week).
3. Quizzes (0-4 per week).
4. Exams (3-8 per term).
5. Projects, for example, computer explorations or modeling activities, (0-10 per term.)

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

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| None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course. | Writing<br>0 - 0% |

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

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| Homework problems | Problem solving<br>5 - 20% |

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

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| None | Skill Demonstrations<br>0 - 0% |

**Exams:** All forms of formal testing, other than skill performance exams.

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| Multiple choice and free response exams; quizzes | Exams<br>70 - 95% |

**Other:** Includes any assessment tools that do not logically fit into the above categories.

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| Projects | Other Category<br>0 - 10% |

**Representative Textbooks and Materials:**
Calculus: Early Transcendentals, 7 th edition. Stewart, James. Brooks/Cole, Cengage Learning: 2012.