

**SOUTHEAST COMMUNITY COLLEGE**  
**DIVISION OF ARTS AND SCIENCES**  
**Mathematics**  
**Revision Date: 2015-01-06**

**Term:** 2015 Winter  
**Course:** MATH-1700-ES31 (Calculus 2)  
**Class Time:** MTWTF 9:30–10:55 CT  
**Class Room:** ESQ 108

**Instructor:** Toby Bartels, PhD  
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**Office Hour:** MTWTF 14:00–15:00 CT  
**Office:** ESQ 112

*Course policies are available at <http://TobyBartels.name/MATH-1700/2015w/>.*

**I. CATALOG DESCRIPTION**

Course Number: MATH-1700  
Course Title: Calculus & Analytic Geometry II  
Prerequisite: A grade of C or higher in MATH-1600 or equivalent.  
Catalog Description: Continuation of MATH-1600. Study of antiderivatives, methods of integration, numerical methods, coordinates and conics, differential equations, Taylor series, and an introduction to the geometry of vectors.  
Credit Hours: 7.5  
Class Hours: 72¼  
Lab Hours: 0  
Total Contact Hours: 72¼

**II. COURSE OBJECTIVES:** *Course will:*

- A. Explore integrable functions and improper integrals.
- B. Explore infinite sequences and series.
- C. Explore power series including Taylor and Maclaurin series.
- D. Investigate alternate ways of defining curves in space including parametric equations and polar coordinates.
- E. Introduce the algebra of vectors and applications of vectors in two and three dimensions.

**III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES**

- A. Student Learning Outcomes: *Student will be able to:*
  1. Use various techniques, including integration by parts, trigonometric substitutions, partial fractions, etc., to evaluate certain integrable functions and compute certain definite integrals.
  2. Apply numerical techniques including the trapezoidal and Simpson's rules to approximate definite integrals.
  3. Apply techniques to determine the convergence or divergence of certain improper integrals.

4. Apply convergence tests, including the Comparison and Ratio Tests, to determine if certain infinite series diverge, converge absolutely, or converge conditionally.
  5. Determine the interval of convergence of power series.
  6. Approximate differentiable functions with Taylor or Maclaurin series.
  7. Write parametric and polar forms of equations to define curves in the plane.
  8. Perform algebraic operations, including the dot and cross product, on vectors.
  9. Use scalars and vectors to write equations for lines, line segments, and planes in space.
- B. General Education Learning Outcomes
1. Thinking Critically: The ability to examine data, ideas, issues and arguments; understand and evaluate assumptions and evidence; and reach logically valid conclusions. *(GELO 2)*
  2. Problem Solving: The ability to define a problem, propose hypotheses and strategies for testing solutions, implement outcomes that address all factors of the problem, evaluate results, and define any need for further work. *(GELO 3)*
  3. Information Literacy: The ability to identify the need for information; identify and assess sources; and interpret, synthesize, organize and use information within legal and ethical guidelines. *(GELO 5)*
  4. Quantitative Reasoning: The ability to reason and solve quantitative problems in a variety of contexts utilizing mathematical manipulations such as words, data sets, graphs, tables, etc. *(GELO 6)*

#### IV. CONTENT/TOPICAL OUTLINE

- A. Separable Differential Equations
- B. Work
- C. Moments and Center of Mass
- D. Integration by Parts
- E. Trigonometric Integrals
- F. Numerical Integration
- G. Improper Integrals
- H. Sequences
- I. Infinite Series
- J. Comparison Tests
- K. The Ratio and Root Tests
- L. Alternating Series and Absolute Convergence
- M. Power Series
- N. Taylor and Maclaurin Series
- O. Convergence of Taylor Series
- P. Polar Coordinates
- Q. Graphing in Polar Coordinates
- R. Area and Arc Length in Polar Coordinates
- S. Three-Dimensional Coordinate Systems
- T. Vectors
- U. The Dot Product (Scalar product)
- V. The Cross Product (Vector product)
- W. Lines and Planes in Space

**V. INSTRUCTIONAL MATERIALS**

- A. Required text: Hass et al, *University Calculus, Early Transcendentals*, 2nd edition, Pearson, 2012: hardback, loose leaf, or through MyMathLab.
- B. Other resources:
  - 1. A graphing calculator is strongly suggested.
  - 2. A MyMathLab access code is recommended.

**VI. METHODS OF PRESENTATION/INSTRUCTION**

- A. Lecture
- B. Small group activities

**VII. METHODS OF EVALUATION**

- A. Homework in small groups
- B. Comprehensive final exam
- C. SCC GRADING SCALE:

A+	95%+	C+	75%+	F	60%–
A	90%+	C	70%+		
B+	85%+	D+	65%+		
B	80%+	D	60%+		

**VIII. SPECIFIC COURSE REQUIREMENTS**

None.

## SYLLABUS STATEMENTS

### **Statement of Equal Opportunity and Nondiscrimination**

It is the policy of Southeast Community College to provide equal opportunity and non-discrimination in admission, attendance and employment matters for all qualified persons, attending or seeking admission to the College, without regard to race, color, ethnicity, religion, sex, age, marital status, national origin, veteran status, sexual orientation, disability, or other factors prohibited by law. Inquiries concerning the application of Southeast Community College's policies on equal opportunity and nondiscrimination should be directed to the Vice President for Access, Equity and Diversity, SCC Area Office, 301 S 68th Street Pl, Lincoln NE 68510-2449; Phone 402-323-3412; Fax 402-323-3420; Internet e-mail [jsoto@southeast.edu](mailto:jsoto@southeast.edu).

### **Americans with Disabilities Act – Reasonable Accommodations**

If you have a disabling condition that may substantially limit your ability to participate in this class, it is your responsibility to contact the Disability Services provider on campus. For additional information and assistance contact:

Lincoln	Room J2	402-437-2620
Milford	Assessment Office	402-761-8202
Beatrice	Jackson Hall – Room J406	402-228-8242

### **Academic Integrity**

Academic Integrity is one of the basic principles of a college community. SCC encourages and expects the highest standards of academic honesty from all students. Please note that cheating, plagiarism, or other forms of academic dishonesty are monitored and subject to disciplinary action.

### **Electronic Devices**

Personal use of any electronic device not authorized by the instructor is prohibited. **Violations may lead to formal disciplinary action.** Instructors, for instructional purposes, may allow in the classroom the use of cell phones and personal electronic devices.

### **Firearms/Weapons Strictly Prohibited**

SCC policy prohibits the possession of firearms, weapons, or fireworks on College property or at any College-sponsored event. Effective January 1, 2007, Nebraska State Statute 69-2441 makes it unlawful to carry a concealed handgun into a meeting of the governing body of a political subdivision, collegiate athletic event, school, school grounds, school-owned vehicle, or school-sponsored activity or athletic event. These prohibitions apply to EVERYONE (employees, students, invitees, and visitors) and are enforceable EVERYWHERE (all college property and all college-related events.) Violations of these prohibitions will result in disciplinary and/or law enforcement action.