

**Eastern WV Community & Technical College
Master Course Record**

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| Course Prefix and Number: MTH 231 |
| Course Title: Calculus II |
| Recommended Transcript Title: Calculus II |
| Date Approved/Revised: |
| Credit Hours: 4 Contact hours per week (Based on 15 week term) Lecture: 4 Lab: |
| Prerequisite: MTH 230 Corequisite: None Pre/Corequisite: None |
| Grading Mode: Letter Grade |
| Catalog Description: This course will continue the study of integration introduced in MTH 230. Topics include applications of integration, integration techniques, sequences, series, parametric and polar equations, and differential equations. This course is designed to be the second in a three-part sequence of differential, integral, and multivariable calculus. |
| Course Outcomes: <ol style="list-style-type: none"> 1. Solve application problems involving the integral 2. Apply various techniques of integration to find integrals 3. Solve differential equations 4. Determine the convergence or divergence of sequences and series 5. Represent a function using a power series 6. Apply the methods of calculus to parametric and polar curves |
| Implementation Cycle: Spring semesters |
| Role in College Curriculum: (Check all that apply) <input checked="" type="checkbox"/> General Education Core (Specify category) Mathematics <input type="checkbox"/> Technical Core (Specify Program) <input type="checkbox"/> Restricted Elective (Specify program) <input type="checkbox"/> General Elective <input type="checkbox"/> Workforce Education <input type="checkbox"/> Other (Please specify) |
| Course Fee: None |
| Instructor's Qualifications: Master's Degree plus 18 graduate level mathematics credits. |
| Expanded Course Description: This course is provided to students as an additional transferable math elective. Expanded course outcomes: <ol style="list-style-type: none"> 1. Solve application problems involving the integral <ol style="list-style-type: none"> a. Find the area between two curves b. Find the volume of a solid |

- c. Find the arc length of a curve
- d. Find the area of a surface of revolution
- e. Define the natural logarithm as an integral
- f. Evaluate integrals involving logarithms
- g. Use exponential functions to model growth and decay
2. Apply various techniques of integration to find integrals
 - a. Evaluate integrals using integration by parts
 - b. Evaluate integrals involving trigonometric functions
 - c. Use trigonometric substitution to evaluate an integral
 - d. Use partial fractions to integrate rational functions
 - e. Use a table of integrals to evaluate an integral
 - f. Approximate the value of a definite integral using the midpoint rule, the trapezoidal rule, and Simpson's rule and determine the error in approximation
 - g. Determine the convergence or divergence of improper integrals
3. Solve differential equations
 - a. Solve separable first-order differential equations
 - b. Solve applications involving differential equations
4. Determine the convergence or divergence of sequences and series
 - a. Determine whether a sequence converges or diverges
 - b. Define infinite series and distinguish between a sequence and a series
 - c. Determine whether a series converges or diverges using the integral, ratio, root, or comparison test
 - d. Test an alternating series for absolute convergence, conditional convergence, or divergence
5. Represent a function using a power series
 - a. Approximate functions using a Taylor polynomial
 - b. Determine the radius and interval of convergence of a power series
 - c. Use Taylor, MacLaurin, and Binomial series to represent functions
 - d. Use a Taylor series to find a limit, differentiate a function, and approximate an integral
6. Apply the methods of calculus to parametric and polar curves
 - a. Represent curves by parametric equations
 - b. Find the derivative and the tangent line of a parametric curve
 - c. Represent points and curves in polar coordinates
 - d. Find the derivative and the tangent line of a polar curve
 - e. Find the area of a region bounded by a polar curve
 - f. Represent conic sections in polar form

Prepared by:

Andrea Williams, Math Faculty

3/16/16

Name, Title

Date

Approved Per LOT Minutes

Dean, Academic and Student Services

Date

Course Number & Title: MTH 231 – Calculus II

Date Prepared: /Revised: 3/16/16

Date Course Approved by LOT: 3/21/16

**Attachment A
General Education Criteria Checklist**

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| Course Number and Title: | MTH 231 – Calculus II |
| Credit Hours: | 4 |
| Proposed General Education Designation: | Mathematics |

| Criteria | Yes | No | Comments |
|--|------------|-----------|-----------------------------------|
| Does the course support one or more of the general education goals defined in BP 3.6 (Specify which goals in comment section) | X | | Mathematical Skills and Reasoning |
| Does the course match one of the defined general education designations (Specify which designation in comment section) | X | | Mathematics |
| Is the course currently listed in the College Catalog | | X | |
| Is the course listed at the 100 level or higher | X | | |
| Is the course broad in scope providing an overview of the subject | X | | |
| Do the course outcomes address theoretical foundations of the discipline | X | | |
| Does the course provide students with the opportunity to develop and apply critical thinking and problem solving skills as identified through MCRF or syllabus | X | | |
| Do course outcomes go beyond teaching technique and application | X | | |
| Are course outcomes applicable to multiple professions | X | | |
| Does the course have prerequisites (If, yes, please note specifics in comment section) | X | | MTH 230 |

(Attach Master Course Record Form)

Attachment A

Syllabus Template

Course Identification and Faculty Contact Information:

- Course Number and Title: MTH 231 – Calculus II
- Semester and Year: *(to be added)*
- Instructor's Name: *(to be added)*
- Instructor's Contact Information and Availability: *(to be added)*
- Day and Time of Class Meeting: *(to be added)*
- Course Index Number (CRN number listed in schedule): *(to be added)*
- Course Materials:
 - Required Text Book(s): *Single Variable Calculus: Early Transcendentals, 2nd edition*. Briggs, Cochran, and Gillett. ISBN 9780321965172. An access code to MyMathLab is also required.
 - Supplemental Course Materials: TI-84 Plus graphing calculator

Course Content and Requirements:

I. Purpose

A. Course Description: This course will continue the study of integration introduced in MTH 230. Topics include applications of integration, integration techniques, sequences, series, parametric and polar equations, and differential equations. This course is designed to be the second in a three-part sequence of differential, integral, and multivariable calculus.

B. Class focus: *(to be added by instructor)*

C. Learner Outcomes:

- a. Solve application problems involving the integral
- b. Apply various techniques of integration to find integrals
- c. Solve differential equations
- d. Determine the convergence or divergence of sequences and series
- e. Represent a function using a power series
- f. Apply the methods of calculus to parametric and polar curves

II. Course Policies

A. Attendance/Tardiness policy: *(to be added)*

B. Grading (Including assignments and scale): *(to be added)*

C. Acceptable style/format of assignments: *(to be added)*

D. Policy on missed deadlines: *(to be added)*

E. Exams (Scheduled and make-up): *(to be added)*

F. *Policy on Academic Dishonesty

Academic dishonesty is any practice which gives one student a dishonorable advantage over another student engaged in the same or similar course of study and which, if known by the instructor in such course of study, would be prohibited. This shall include, but is not limited to, the following: securing or giving assistance during examinations or on required work; the improper use of books, notes, or other sources of information; submitting as one's own work or

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creation of any kind that which is wholly or in part created by another; securing and/or distributing all or any part of examinations or assignments prior to their being submitted to the class as a whole; or the altering of any grade or academic record.

If an occurrence of Academic Dishonesty is observed on the part of a student, the case shall be handled in accordance with the procedures identified in the Student Handbook.

G. *Americans with Disabilities Act (ADA) notice:

In accordance with the American with Disabilities Act, Eastern West Virginia Technical and Community College's programs and courses will be accessible to the handicapped and disabled. If you have a disability which impairs your access to this course or your ability to pursue the coursework as it is presented, notify the instructor. Eastern's ADA contact is the Student Services Specialist.

H. *Title VII notice:

Eastern West Virginia Technical and Community College is dedicated to ensuring a positive classroom environment. Discriminatory comments and actions based on age, race, religion, marital status, and gender are inappropriate classroom behaviors and will not be tolerated. Any further suggestions that would work to maintain such an environment should be directed to the instructor.

I. *Syllabus Change Statement:

This syllabus is subject to change as determined by the instructor. **Students will be provided a written notification of any changes in course requirements and assignments.**

III. *Course Schedule

- A. Outline of course content: *(to be added)*
- B. Schedule of course activities including testing dates, assignments and assignment due dates: *(to be added)*
- C. Required readings with author, title of book, and page numbers: *(to be added)*
- D. Recommended readings: *(to be added)*
- E. Supplemental learning resources: *(to be added)*

*These policies or statements must appear on all course syllabi.