

**Course Information**

<b>Course Title</b>	Calculus II
<b>Course Prefix, Num. and Title</b>	MATH 2414
<b>Division</b>	Math & Physical Sciences
<b>Department</b>	Mathematics
<b>Course Type</b>	Academic WCJC Core Course
<b>Course Catalog Description</b>	Differentiation and integration of transcendental functions; parametric equations and polar coordinates; techniques of integration; sequences and series; improper integrals.
<b>Pre-Requisites</b>	MATH 2413 Calculus I; or consent of department head
<b>Co-Requisites</b>	None

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	4:4:0
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	4
<b>Lab/Other Hours Breakdown: Lab Hours</b>	0
<b>Lab/Other Hours Breakdown: Clinical Hours</b>	0
<b>Lab/Other Hours Breakdown: Practicum Hours</b>	0
<b>Other Hours Breakdown</b>	0

**Approval Signatures**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>		
<b>Department Head:</b>		
<b>Division Chair:</b>		
<b>Dean/VPI:</b>		
<b>Approved by CIR:</b>		

## Additional Course Information

**Topical Outline:** Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

### Chapter 5 - Applications of Integration

- 5.1 Areas Between Curves
- 5.2 Volumes
- 5.3 Volumes by Shells
- 5.4 Work
- 5.5 Average Value of Functions

### Chapter 7 - Techniques of Integration

- 7.1 Integration by Parts
- 7.2 Trigonometric Integrals
- 7.3 Trigonometric Substitution
- 7.4 Integration of Rational Functions by Partial Fractions
- 7.5 Strategy for Integration
- 7.6 Integration Using Tables and Computer Algebra Systems
- 7.7 Approximate Integration
- 7.8 Improper Integrals

### Chapter 8 - Further Applications of Integration

- 8.1 Arc Length
- 8.2 Area of a Surface of Revolution
- 8.3 Applications to Physics and Engineering
- 8.4 Applications to Economics and Biology
- 8.5 Probability

### Chapter 10 - Parametric Equations and Polar Coordinates

- 10.1 Curves by Parametric Equations
- 10.2 Calculus with Parametric Curves
- 10.3 Polar Coordinates
- 10.4 Areas and Lengths in Polar Coordinates
- 10.5 Conic Sections
- 10.6 Conic Sections in Polar Coordinates

### Chapter 11 - Infinite Sequences and Series

- 11.1 Sequences
- 11.2 Series
- 11.3 The Integral Test and Estimate of Sums
- 11.4 The Comparison Tests
- 11.5 Alternating Series
- 11.6 Absolute Convergence and the Ratio and Root Tests
- 11.7 Strategy for Testing Series
- 11.8 Power Series
- 11.9 Representations of Functions as Power Series
- 11.10 Taylor and MacLaurin Series
- 11.11 Approximately by Taylor Polynomials

## Course Learning Outcomes:

### Learning Outcomes – Upon successful completion of this course, students will:

1. Use the concepts of definite integrals to solve problems involving area, volume, work, and other physical applications.
2. Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals.
3. Define an improper integral.
4. Apply the concepts of limits, convergence, and divergence to evaluate some classes of improper integrals.
5. Determine convergence or divergence of sequences and series.
6. Use Taylor and Maclaurin series to represent functions.
7. Use Taylor or Maclaurin series to integrate functions not integrable by conventional methods.
8. Use the concept of polar coordinates to find areas, lengths of curves, and representations of conic sections.

### Methods of Assessment:

Final Exam (Required)

Other Methods of Assessment:

- Hour Exams
- Homework
- Quizzes
- Short Answer
- Discussion Board
- Participation
- Projects

## Required text(s), optional text(s) and/or materials to be supplied by the student:

Calculus, 8th Edition, 2016; Stewart; Cengage (required)

Calculator (instructor's discretion)

Students must have computer access to the WCJC website, their WCJC student email and online accounts. WCJC has open computer labs, with internet access, on all campuses for students to use.

## Suggested Course Maximum:

35

## List any specific or physical requirements beyond a typical classroom required to teach the course.

None

**Course Requirements/Grading System:** Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

- A. Final Exam 15-30%  
B. Other Course Requirements 70-85%

A = 90-100%

- B = 80-89%
- C = 70-79%
- D = 60-69%
- F = 59% or below

### Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
  - Critical Thinking
  - Communication
  - Empirical & Quantitative Skills
  - Teamwork
  - Social Responsibility
  - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist

**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2414 – Calculus II

**Core Objective:**

**Critical Thinking Skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written work. Grading for correctness and the rubric for critical thinking will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

---

Date: 11-20-2019



**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2414 – Calculus II

**Core Objective:**

**Communication Skills**—to include effective development, interpretation and expression of ideas through written, oral and visual communication

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student’s written work. Grading for correctness and the rubric for communication skills will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

Date: 11-20-2019

**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2414 – Calculus II

**Core Objective:**

**Empirical and Quantitative Skills**—to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written work. Grading for correctness and the rubric for EQS will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.

Date: 11-20-2019