This course supports the assessment for QKT2. The course covers 3 competencies and represents 2 competency units.

Introduction

Overview
Calculus originated from the study of important problems for which algebra was insufficient. In Calculus I you studied several of these problems: finding the slope of a tangent line, minimum and maximum problems, and velocity and acceleration problems. In Calculus II you will study another important problem in the development of calculus: finding the area under a curve. You will study this problem and other applications of integration as you progress through this course. As you do, keep in mind that calculus is not a theoretical branch of mathematics; calculus is used by scientists, engineers, and economists and has numerous applications to daily life.

Competencies
This course provides guidance to help you demonstrate the following 3 competencies:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.

Teaching Dispositions Statement
Please review the [WGU Statement of Teaching Dispositions](#).

Course Mentor Assistance
As you prepare to successfully demonstrate competency in this subject, remember that course mentors stand ready to help you reach your educational goals. As subject matter experts, mentors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course mentors are excited to hear from you and eager to work with you.

Successful students report that working with a course mentor is the key to their success. Course mentors are able to share tips on approaches, tools, and skills that can help you apply the content you're studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don't work out on your first try, course mentors act as a support system to guide you through the revision process. You should expect to work with course mentors for the duration of your coursework, so you are welcome to contact them as soon as you begin. Course mentors are fully committed to your success! If you need assistance, please contact the course mentor assigned to you.

Preparing for Success
The information in this section is provided to detail the resources available for you to use as you complete this course.

**Learning Resources**

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

**Automatically Enrolled Resources**

**VitalSource E-Texts**

The following textbook is available to you as an e-text within this course. You will be directly linked to the specific readings required within the activities that follow. *This e-text is available to you as part of your program tuition and fees, but you may purchase a hard copy at your own expense through a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition.*


**Pearson MyMathLab**

When you are completing the various Quizzes, Diagnostics, and Homework, be aware that each time you work them, you will be given a slightly different set of problems. The expectation is you do each of them a few times, or even more. Before you take your next attempt, make absolutely certain that you review your work – when you do so, all of the e-texts interactive materials become available. You will be able to "View an Example," have the textbook "Help Me Solve This," watch the relevant “Videos” and “Animations” if any exist, and click straight to the textbook section needed. Reviewing a problem with these supplements will help you deepen your understanding, build your problem solving skills, and commit the skills, procedures, and concepts to memory.

**Thinkwell**

You will access the materials in the following Thinkwell course at the activity level within this course. This web-based resource includes multimedia video lectures, review notes, interactive animations, and sample exercises:

- Thinkwell Calculus, ONLINE, CRN 03U

**Additional Preparations**

**Graphing Calculator**

Acquire a graphing calculator and familiarize yourself with how to use it. Refer to the [WGU Calculator and Scratch Paper Guidelines](#) document for calculators permitted on WGU exams. If you are in a secondary mathematics program, refer to the [WGU Calculator Recommendations for Secondary Math and Science Programs](#) document for calculator suggestions for your degree program.
Pretest and Review Material

Before you engage in this course, you may want to check your existing knowledge and understanding of this material.

Course Pretest

This course will prepare you with knowledge of Calculus II material. If you have previous experience with this material, you may want to complete a Course Diagnostic to simulate an exam for further practice and verification of your understanding.

This topic addresses the following competencies:

- **Competency 209.7: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.
- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.
- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.

Course Diagnostic

If you feel you already know this material, complete the following quiz. However, if this is new material for you, or it has been a long time since you learned this material, stop this activity and move carefully through the entire course.

- **WGU Calculus II: Course Diagnostic**

  https://lrps.wgu.edu/provision/34334391

  **Note:** If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.

Brief Review of Differentiation

You will review from Calculus I the concept of a derivative as a rate of change and how it can be used to describe motion of an object's position, velocity, and acceleration.

This topic addresses the following competencies:

- **Competency 209.7: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.
- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.
- **Competency 209.7.3: Sequences**
The graduate demonstrates a conceptual understanding of sequences.

**The Derivative as a Rate of Change; Position, Velocity, and Acceleration**

Watch both videos within the following Thinkwell Calculus section:

- **section 7.1 ("Position and Velocity")**

Read the following section in *Thomas’ Calculus*:

- **chapter 3** - section 3.4 ("The Derivative as a Rate of Change")

To check your understanding of these concepts, complete the following:

- WGU Calculus I: section 3.4

https://lrps.wgu.edu/provision/34576336

If you need additional review consider also doing sections 3.2, and 3.5

https://lrps.wgu.edu/provision/34576329

https://lrps.wgu.edu/provision/34576326

**Task 2 Part A**

You now have the competency necessary to complete part A of Calculus II Task 2.

This topic addresses the following competencies:

- **Competency 209.7: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.

**Task 2: Part A**

You will be directed to completing the other parts of this task as you progress through this course.

Begin the following task in *Taskstream*:

- Calculus II: Task 2, Part A

The following web page includes clarifications for Calculus II, Task 2, which may be helpful as
you prepare your response:

- "Calculus II Task 2 Clarification Document"

Do not submit your work on this task yet. You will submit your work on this task when you have completed all parts of it.

For details about this performance assessment, see the "Assessment" tab in this course.

**Integration**

You will learn about the concept of an antiderivative and be introduced to the concept of integration. You will also learn about the important connection between differentiation and integration as you study the Fundamental Theorem of Calculus.

**Integration Preview**

You may want to check your existing knowledge and understanding of this material.

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Integration Quiz Preview**

If you feel you already know this material, complete the following quiz.

- WGU Calculus II: Quiz - Integration

  [https://lrps.wgu.edu/provision/34334424](https://lrps.wgu.edu/provision/34334424)

*Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.*

**Integration**

Finding the area of many common shapes can be a relatively simple process. Shapes like circles, rectangles, and triangles have well-defined formulas. Finding the area for other shapes can be more difficult. The concept of integration can be used to find the area of other shapes without well-defined formulas.

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.
Analysis of Motion

Review the information under example 6 on the following page in section 4.2 of *Thomas’ Calculus*:

- chapter 4 - Section 4.2 ("The Mean Value Theorem") page 282

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 4.2

[https://lrps.wgu.edu/provision/34335623](https://lrps.wgu.edu/provision/34335623)

Antidifferentiation

Watch all the videos within the following Thinkwell Calculus section:

- section 9.1 ("Antiderivatives")
- section 10.1 ("Motion")

If you need additional review, watch the following videos from Khan Academy:

- "Indefinite Integrals as Anti-derivative"

Review the following section in *Thomas’ Calculus*:

- chapter 4

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 4.8

[https://lrps.wgu.edu/provision/34335647](https://lrps.wgu.edu/provision/34335647)

Approximating Area

Watch all of the videos in the following Thinkwell Calculus sections:

- section 9.4.1 ("Approximating Areas of Plane Regions")

Review the following section in *Thomas’ Calculus*:

- chapter 5

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.1
Riemann Sums

Review the following section in *Thomas’ Calculus*:

- **chapter 5** - section 5.2 ("Sigma Notation and Limits of Finite Sums")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.2

The Definite Integral

Watch all the videos in the following Thinkwell Calculus sections:

- **section 9.4.2** ("Areas, Riemann Sums, and Definite Integrals")
- **section 18.1.1** ("Finding the Average Value of a Function")

If you need additional review, watch the following videos from Khan Academy:

- "Riemann Sums"
- "Properties of the Definite Integral"

Review the following section in *Thomas’ Calculus*:

- **chapter 5** - section 5.3 ("The Definite Integral")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.3

The Fundamental Theorem of Calculus

Watch each of the videos in the following Thinkwell Calculus sections:

- **section 9.4.3** ("The Fundamental Theorem of Calculus, Part I")
- **section 9.4.4** ("The Fundamental Theorem of Calculus, Part II")
- **section 9.4.5** ("Illustrating the Fundamental Theorem of Calculus")
- **section 9.4.6** ("Evaluating Definite Integrals")

If you need additional review, watch the following videos from Khan Academy:

- **Fundamental Theorem of Calculus**
Review the following section in *Thomas' Calculus*:

- section 5.4 ("The Fundamental Theorem of Calculus")

Review the following web pages for frequently asked questions about the Fundamental Theorem of Calculus as well as an essay about its importance:

- "Fundamental Theorem of Calculus FAQs"
- "Restore the Integral to the Fundamental Theorem of Calculus"

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.4

https://lrps.wgu.edu/provision/34335848

**Task 2 Parts D and E**

You now have the competency to complete parts D and E of Calculus II Task 2.

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Performance Task 2: Parts D and E**

You will be directed to completing the other parts of this task as you progress through this course.

Complete the following task subsections in TaskStream:

- Calculus II: Task 2, Part D
- Calculus II: Task 2, Part E

The following document includes clarifications for Calculus II, Task 2, which may be helpful as you prepare your response:

- "Calculus II Task 2 Clarification Document"

Do not submit your work on this task yet. You will submit your work on this task when you have completed all parts of it.

For details about this performance assessment, see the "Assessment" tab in this course.

**Indefinite Integrals**

You almost have the competency to complete Calculus II Task 1.

This topic addresses the following competency:
Competency 209.7.1: Integration
The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

Indefinite Integrals and Substitution

Watch all the videos in the following Thinkwell Calculus sections:

- section 9.2 ("Integration by Substitution")
- section 9.3 ("Illustrating Integration by Substitution")

If you need additional review, watch the following videos from Khan Academy:

- U-Substitution

Review the following section in Thomas’ Calculus:

- chapter 5 - section 5.5 ("Indefinite Integrals and the Substitution Rule")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.5

https://lrps.wgu.edu/provision/34335891

Task 1
You now have the competency to complete Calculus II Task 1

This topic addresses the following competency:

- Competency 209.7.1: Integration
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

Task 1
Complete the following task in TaskStream

  - Calculus II: Task 1

For details about this performance assessment, see the "Assessment" tab in this course.

Area Between Curves

Watch all of the videos in the following Thinkwell Calculus sections:

- section 10.2 ("Finding the Area between Two Curves")
- section 10.3 ("Integrating with Respect to y")
If you need additional review, watch the following videos from Khan Academy:

- **Area Between Curves**

Review the following section in *Thomas’ Calculus*:

- **chapter 5** - section 5.6 (“Substitution and Area Between Curves”)

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 5.6A
- WGU Calculus II: section 5.6B

[https://lrps.wgu.edu/provision/34336082](https://lrps.wgu.edu/provision/34336082)

[https://lrps.wgu.edu/provision/34336105](https://lrps.wgu.edu/provision/34336105)

**Integration Review**

You may wish to review this material now in order to help you prepare for the Praxis II exam.

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Integration Review Quiz**

Complete the following quiz:

- WGU Calculus II: Quiz - Integration

[https://lrps.wgu.edu/provision/34334424](https://lrps.wgu.edu/provision/34334424)

*Note: You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz you will be given a slightly different set of problems. After each attempt, be sure to review your answers and utilize the interactive features (“Help Me Solve This,” “View an Example,” “Video,” etc.) to help you correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, and review the information on those topics from above and/or get in contact with your course mentor.*

**Applied Integration**

You will learn how to apply the relationship of limiting Riemann sums to finding areas with the definite integral to now find volumes of revolution and the length of plane curves.

**Applied Integration Preview**
You may want to check your existing knowledge and understanding of this material.

This topic addresses the following competency:

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Applied Integration Quiz Preview**

If you feel you already know this material, complete the following quiz. However, if this is new material for you, or if it has been a long time since you learned this material, skip the activity and move carefully through the following activities.

- **WGU Calculus II: Quiz - Applied Integration**
  
  https://lrps.wgu.edu/provision/34334508

*Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.*

**Analysis of Length and Volume**

You will explore a variety of applications that require the use of antidifferentiation to analyze measures of length and volume. Think about these techniques as you go about your daily life. Can you find and make up your own problems from the everyday things you see around you?

This topic addresses the following competency:

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Volume of Solids of Revolution: Disk and Washer Methods**

Watch all the videos in the following Thinkwell Calculus sections:

- **section 18.2 ("Finding Volumes Using Cross-Sections")**
- **section 18.3 ("Disks and Washers")**

If you need additional review, watch the following videos from Khan Academy:

- **“Solids of Revolution – Disc Method”**

Review the following section in *Thomas’ Calculus*:

- **section 6.1 ("Volumes by Slicing and Rotation About an Axis")**
To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 6.1

https://lrps.wgu.edu/provision/34336592

**Volume of Solids of Revolution: Shell Method**

Watch all of the videos in the following Thinkwell Calculus section:

- section 18.4 ("Shells")

If you need additional review, watch the following video from Khan Academy:

- “Solids of Revolution – Shell Method”

Review the following section in *Thomas’ Calculus*:

- chapter 6 - section 6.2 ("Volumes by Cylindrical Shells")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 6.2

https://lrps.wgu.edu/provision/34336606

**Arc Lengths**

*Note: You now have the competency necessary to continue Calculus 2 Task 2, so you may complete Parts B and C before learning about arc lengths.*

Watch all of the videos in the following Thinkwell Calculus section:

- OPTIONAL: section 21.1.1 ("An Introduction to Parametric Equations")
- section 21.2.3 ("The Arc Length of a Parameterized Curve")
- section 21.2.4 ("Finding Arc Lengths of Curves Given by Parametric Equations")
- section 18.5 ("Arc Lengths and Functions")

Review the following section in *Thomas’ Calculus*:

- chapter 6 - section 6.3 ("Arc Length")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 6.3
Task 2 Parts B and C
You now have the competency necessary to complete parts B and C of Calculus II Task 2.

This topic addresses the following competency:

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Task 2: Parts B and C**

You will be directed to completing the other parts of this task as you progress through this course.

Complete the following task subsections in **TaskStream**:

- Calculus II: Task 2: Part B
- Calculus II: Task 2: Part C

The following web page includes clarifications for Calculus II, Task 2, which may be helpful as you prepare your response:

- "[Calculus II Task 2 Clarification Document](#)"

Do not submit your work on this task yet. You will submit your work on this task when you have completed all parts of it.

For details about this performance assessment, see the "Assessment" tab in this course.

**Applied Integration Review**
You may wish to review this material now in order to help you prepare for the Praxis II exam.

This topic addresses the following competency:

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Applied Integration Review Quiz**

Complete the following quiz:

- WGU Calculus II: Quiz - Applied Integration

[https://lrps.wgu.edu/provision/34334508](https://lrps.wgu.edu/provision/34334508)

*Note: You will need to attempt this quiz multiple times under exam-like conditions for extra*
practice and verification of your understanding. Each time you attempt this quiz you will be given a slightly different set of problems. After each attempt, be sure to review your answers to help you correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, and review the information on those topics from above and/or get in contact with your course mentor.

**Logarithmic and Exponential Functions**

You will study logarithmic and exponential functions. This section uses integration to provide a precise definition of the natural logarithm and the number $e$. It also discusses rules for finding derivatives and integrals of various logarithmic and exponential functions, as well as some of their applications in exponential growth and decay problems.

**Logarithmic and Exponential Functions**

You will study logarithmic and exponential functions and their applications in the context of differentiation and integration. The logarithmic function as an integral will be defined and the important applications of exponential growth and decay will be discussed.

This topic addresses the following competencies:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.
- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Logarithmic Function**

Watch all the videos in the following Thinkwell Calculus section:

- [section 15.1.1 ("The Exponential and Natural Log Functions")](#)
- [section 15.1.2 ("Differentiating Logarithmic Functions")](#)

Review the following section in *Thomas’ Calculus*:

- [chapter 7 - section 7.1 ("The Logarithm Defined as an Integral")](#)

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 7.1

[https://lrps.wgu.edu/provision/34336848](https://lrps.wgu.edu/provision/34336848)

**Exponential Growth and Decay**

Watch the following video from Khan Academy:
Review the following section in *Thomas’ Calculus*:

- section 7.2 (“Exponential Growth and Decay”)

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 7.2

**Integration Techniques**

You will explore some of the more advanced integration techniques. You will be given an overview of how to use a variety of integration methods for finding indefinite integrals of the more complex functions than you have yet worked with. You will also be introduced to the concept of the improper integral, which is a definite integral with an unbounded limit.

**Integration Techniques Preview**

You may want to check your existing knowledge and understanding of this material

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Integration Techniques Quiz Preview**

If you feel you already know this material, complete the following quiz. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the following activities.

- WGU Calculus II: Quiz - Integration Techniques

**Note:** If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.

**Integration Techniques**

You will explore techniques for finding indefinite integrals for functions that are more complicated than those studied thus far. You will study basic integration formulas, integration by parts, integration by partial fractions, numerical integration, and improper integrals.

This topic addresses the following competency:
- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Basic Integration Formulas**

Review the following section in *Thomas’ Calculus*:

- **chapter 8** - section 8.1 ("Basic Integration Formulas")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 8.1
  
  https://lrps.wgu.edu/provision/34337157

**Integration by Parts**

Watch all of the videos in the following Thinkwell Calculus section:

- **section 16.6 ("Integration by Parts")**

If you need additional review, watch the following videos from Khan Academy videos with a focus on Integration by Parts:

- “Integration by Parts”

Review the following section in *Thomas’ Calculus*:

- **chapter 8** - section 8.2 ("Integration by Parts")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 8.2
  
  https://lrps.wgu.edu/provision/34337211

**Integration by Partial Fractions**

Watch all the videos in the following Thinkwell Calculus sections:

- **section 16.4 ("An Introduction to Integration by Partial Fractions")**
- **section 16.5 ("Integration by Partial Fractions with Repeated Factors")**

Review the following section in *Thomas’ Calculus*:

- **chapter 8** - section 8.5 ("Integration of Rational Functions by Partial Fractions")

To check your understanding of these concepts, complete the following:
- WGU Calculus II: section 8.5
  
  https://lrps.wgu.edu/provision/34337489

**Trigonometric Substitution**

Watch all of the videos in the following Thinkwell Calculus section:

- section 16.7 ("An Introduction to Trigonometric Substitution")
- section 16.8 ("Trigonometric Substitution Strategy")

If you need additional review, watch the following videos from Khan Academy with a focus on Trigonometric Substitution:

- "Trigonometric Substitution"

Review the following section in *Thomas’ Calculus*:

- chapter 8 - section 8.4 ("Trigonometric Substitutions")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 8.4
  
  https://lrps.wgu.edu/provision/34337346

**Numerical Integration**

Watch all the videos in the following Thinkwell Calculus section:

- section 16.9 ("Numerical Integration")

Review the following section in *Thomas’ Calculus*:

- chapter 8 - section 8.7 ("Numerical Integration")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 8.7
  
  https://lrps.wgu.edu/provision/34337531

**Improper Integrals**

Watch all the videos in the following Thinkwell Calculus section:
- **section 17.1 ("Improper Integrals")**

Review the following section in *Thomas’ Calculus*:

- **chapter 8** - section 8.8 ("Improper Integrals")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 8.8

[https://lrps.wgu.edu/provision/34337578](https://lrps.wgu.edu/provision/34337578)

**Integration Techniques Review**
You may wish to review this material now in order to help you prepare for the Praxis II exam.

This topic addresses the following competency:

- **Competency 209.7.1: Integration**
  The graduate demonstrates a conceptual understanding of integration techniques and correctly applies them.

**Integration Techniques Review Quiz**

Complete the following quiz:

- WGU Calculus II: Quiz - Integration Techniques

[https://lrps.wgu.edu/provision/34334682](https://lrps.wgu.edu/provision/34334682)

*Note: You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz, you will be given a slightly different set of problems. After each attempt, be sure to review your answers and utilize the interactive features ("Help Me Solve This," "View an Example," "Video," etc.) to help you correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, and review the information on those topics from above and/or get in contact with your course mentor.*

**Differential Equations**

You will apply your understanding of antidifferentiation to solve differential equations. The topic of differential equations covers a vast area that will be lightly touched on here. A first-order differential equation is an equation that relates the values of the function to the derivative of the function. In other words, it is an equation that includes dy/dx as part of the equation.

**Differential Equations Preview**

You may want to check your existing knowledge and understanding of this material.

This topic addresses the following competency:
Competency 209.7.2: Applied Integration
The graduate applies integration in various ways in order to solve problems, including differential equations.

Differential Equations Quiz Preview

If you feel you already know this material, complete the following quiz. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the following activities.

WGU Calculus II: Quiz - Differential Equations
https://lrps.wgu.edu/provision/34335557

Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.

Differential Equations

You will review how to use selected antidifferentiation methods to solve differential equations in the context of a variety of applications. You will learn how to solve separable differential equations and logistic differential equations.

This topic addresses the following competency:

- Competency 209.7.2: Applied Integration
  The graduate applies integration in various ways in order to solve problems, including differential equations.

Separable Differential Equations

Watch all the videos in the following Thinkwell Calculus section:

- section 20.1 ("Separable Differential Equations")

If you need additional review, watch the following video from Khan Academy:

- “Intro to Differential Equations”

Review the following section in Thomas’ Calculus:

- chapter 9 - section 9.1 ("Slope Fields and Separable Differential Equations")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 9.1

https://lrps.wgu.edu/provision/34337647

Logistic Differential Equations
Watch the following video from YouTube and/or read the following document to learn about the logistic differential equation:

- video: "The Logistic Equation and the Analytic Solution"
- document: "The Logistic Differential Equation"

Pay particular attention to how using separable differential techniques and integration with partial fractions is the key to solving a logistic differential equation.

Watch the following videos from YouTube for some examples of using a logistic differential equation in a population application.

- "The Logistic Equation and Models for Population - Example 1, part 1"
- "The Logistic Equation and Models for Population - Example 1, part 2"

Now try to find the solution to the following logistic differential equation given in section 9.1:

- chapter 9 - section 9.1 exercise 31

Try to identify the values in this problem that are represented by P, t, k, and K as defined in the standard form of the logistic differential equation you read and watched videos on from above. Try to solve it by hand by separating the variables, using partial fractions, and integrating both sides to get the solution. See if your result matches what you would have gotten if you just used the solution to the logistic differential equation as given in the videos and readings above. The solution to this problem cannot be checked from the solution manual, so the solution is given here:

- Solution Logistic Differential Equations

For additional review, read through the following explanation and examples:

- "Logistic Differential Equations for AP Calculus"

**Differential Equations Review**

You may wish to review this material now in order to help you prepare for the Praxis II exam.

This topic addresses the following competency:

- **Competency 209.7.2: Applied Integration**
  The graduate applies integration in various ways in order to solve problems, including differential equations.

**Differential Equations Review Quiz**

Complete the following quiz:

- WGU Calculus II: Quiz - Differential Equations
Sequences

A sequence is a function whose domain is the set of positive integers. A sequence is typically represented as a list of numbers separated by commas. You will study the concept of a sequence, including finding the limit of a sequence as the input value goes to infinity.

Sequences Preview

You may want to check your existing knowledge and understanding of this material.

This topic addresses the following competency:

- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.

Sequences Quiz Preview

If you feel you already know this material, complete the following quiz.

- WGU Calculus II: Quiz - Sequences

https://lrps.wgu.edu/provision/34335596

Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended e-text exercises, readings, or videos). However, you will still need to read through the following activities because there are important directions in completing the assessment.

Sequences

Different sequences possess different properties, and those properties provide the keys to discovering their behaviors and sums. You will review a variety of introductory sequence topics. Many advanced calculus topics will require you to understand how to use sequences in a variety of applications. This will also prepare you to investigate the concept of a series, which is the summation of a sequence, in Calculus III.

This topic addresses the following competency:

- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.
Sequences

Watch all of the videos in the following Thinkwell Calculus sections:

- section 19.1 ("Sequences")
- section 19.2 ("Monotonic and Bounded Sequences")

Review the following section in Thomas’ Calculus:

- chapter 10 - section 10.1 ("Sequences")

To check your understanding of these concepts, complete the following:

- WGU Calculus II: section 10.1

https://lrps.wgu.edu/provision/34335596

The Fibonacci Sequence

Navigate to the following web pages to explore some very important questions regarding the Fibonacci sequence and its relationship to the golden ratio within a variety of selected applications:

- "Fibonacci Numbers and the Golden Section"
- "The Golden Ratio and The Fibonacci Numbers"
- "Golden Ratio - Relationship to Fibonacci sequence"

Task 2 Part F

You now have the competency to complete part F of Calculus II Task 2.

This topic addresses the following competency:

- Competency 209.7.3: Sequences
  The graduate demonstrates a conceptual understanding of sequences.

Task 2: Part F

Complete the following task in TaskStream:

- Calculus II: Task 2: Part F

The following web page includes clarifications for Calculus II, Task 2, which may be helpful as you prepare your response:

- "Calculus II Task 2 Clarification Document"

Upon completing this, you should now have completed all parts of this task and submit it for evaluation.
For details about this performance assessment, see the "Assessment" tab in this course.

**Sequences Review**
You may wish to review this material now in order to help you prepare for the Praxis II exam.

This topic addresses the following competency:

- **Competency 209.7.3: Sequences**
  The graduate demonstrates a conceptual understanding of sequences.

**Sequences Review Quiz**

Complete the following quiz:

- WGU Calculus II: Quiz - Sequences

[https://lrps.wgu.edu/provision/34335596](https://lrps.wgu.edu/provision/34335596)

Note: You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz you will be given a slightly different set of problems. After each attempt, be sure to review your answers to help you correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, and review the information on those topics from above and/or get in contact with your course mentor.

**Course Review**

Now that you have completed all the content for this course, you will want to check your understanding of the entire content of the course in one exam-like setting. This will help you prepare for the Praxis II exam.

**Course Diagnostic**

Complete the following course diagnostic:

- WGU Calculus II: Course Diagnostic

[https://lrps.wgu.edu/provision/34334391](https://lrps.wgu.edu/provision/34334391)

Note: You will need to attempt this course diagnostic multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this course diagnostic, you will be given a slightly different set of problems. After each attempt, be sure to review your answers to help you correct your errors. Before finalizing your work on this course, you should reach at least 70% on 3 attempts in a row with this course diagnostic. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, and review the information on those topics from above and/or get in contact with your course mentor.

**Final Steps**

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Congratulations on completing the activities in this course! This course has prepared you to complete the assessment associated with this course. If you have not already been directed to complete the assessment, schedule and complete your assessment now.

**The WGU Library**

**The WGU Library**
The WGU Library is available online to WGU students 24 hours a day.

For more information about using the WGU Library, view the following videos on The WGU Channel:

Introducing the WGU library

*Note: To download this video, right-click the following link and choose "Save as...": [download video].*

Searching the WGU library

*Note: To download this video, right-click the following link and choose "Save as...": [download video].*

**Center for Writing Excellence: The WGU Writing Center**

If you need help with any part of the writing or revision process, contact the Center for Writing Excellence (CWE). Whatever your needs—writing anxiety, grammar, general college writing concerns, or even ESL language-related writing issues—the CWE is available to help you. The CWE offers personalized individual sessions and weekly group webinars. For an appointment, please e-mail writingcenter@wgu.edu.

**Feedback**

WGU values your input! If you have comments, concerns, or suggestions for improvement of this course, please submit your feedback using the following form:

- Course Feedback

**ADA Policy**

Western Governors University recognizes and fulfills its obligations under the Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 and similar state laws. Western Governors University is committed to provide reasonable accommodation(s) to qualified disabled learners in University programs and activities as is required by applicable law(s). ADA Support Services serves as the principal point of contact for students seeking accommodations and can be contacted at ADASupport@wgu.edu. Further information on WGU’s ADA policy
and process can be viewed in the student handbook at the following link:

- Policies and Procedures for Students with Disabilities