

MATH226 16

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Course Summary

Course : MATH226 **Title :** Calculus II

Length of Course : 16

Prerequisites : MATH225 **Credit Hours :** 3

Description

Course Description: This is the second course of a three part Calculus sequence. It is designed to extend the concepts learned in Calculus I to the concepts and techniques of integral calculus. Topics include the basics of integration (anti-derivatives, substitution, and the Fundamental Theorem), applications of integration (motion, area), L'Hopital's Rule (indeterminate quotients, indeterminate forms), elementary function inverses (inverse functions, Calculus of inverses, trigonometry function inverses, Calculus of these inverses), techniques of integration (tables, powers of Sine and Cosine, other Trigonometric powers, by parts, trigonometric substitution, and numerical analysis), improper integrals, integral applications (average value, volumes by cross-sections, disk & washers, shells, arc lengths, and work). (Prerequisite: MATH225)

Course Scope:

This course is presented on-line through a combination of the APUS and the THINKWELL websites. It uses a specially developed on-line text and workbook and is supplemented by video lectures covering each of the key mathematical skills needed to succeed in the course. Exercises are included there and are a required part of the course. The main objective of this second course is to introduce the concepts of integral calculus and the techniques for analyzing and solving problems using its techniques. The course is organized into several distinct parts. The first part of the course introduces the basic concept and methods of integration and leads to the fundamental theorem of calculus. The second part of the course gives some elementary applications of integration. This is followed by an analysis of indeterminate forms of a limit. Inverse functions and their derivative are then introduced. The next part of the course focuses on more advanced techniques of integration. A brief section on improper integrals is then introduced. Finally, several key applications of integral calculus are then explored. Practical applications are emphasized throughout the course.

Objectives

After completing the course, you will be able to:

1. Use anti-derivatives.
2. Use the Fundamental Theorem of Calculus to solve problems of motion and area.
3. Solve indeterminate limits using L'Hopital's rule.
4. Solve Calculus problems with exponential and logarithmic functions.

5. Evaluate inverse trig functions.
 6. Integrate functions using techniques for powers, partial fractions, by parts, and trigonometric substitution.
 7. Use numerical integration to approximate integrals using the trapezoidal rule.
 8. Solve improper integrals.
 9. Apply integration to problems involving average value, volumes, arc lengths and work.
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Outline

Week 1: The Basics of Integration

Learning Objective(s)

Course Objective 1

2.1 Anti-derivatives

Find the Anti-derivative of a function

Use integral notation;

Use the constant of integration;

Use the power rule for integration;

Use the constant multiple rule for integration;

Use the sum rule for integration

Use integration rules for trigonometric and exponential functions

2.2 Integration by Substitution

Identify integrals to solve through integration by substitution

Solve integrals through integration by substitution

2.3 Illustrating Integration by Substitution

Solve composite trigonometric integrals by substitution

Solve composite exponential and rational integrals by substitution

*1.1 The Power Rule

Uses of the Power Rule

*1.2 The Product & Quotient Rules

The Product Rule

The Quotient Rule

*1.3 The Chain Rule

An Introduction to the Chain Rule

Using the Chain Rule

Combining Computational Techniques

Reading and Videos

Sections 2.1.1 – 2.1.3 with videos:
-Go to Thinkwell-

[Anti-differentiation](#)

Blue ink is a direct link to these sites

[Anti-derivatives of Powers of \$x\$](#)

[Anti-derivatives of Trigonometric and Exponential Functions](#)

Sections 2.2.1 – 2.2.2 with videos:

[Undoing the Chain Rule](#)

[Integrating Polynomials by Substitution](#)

Sections 2.3.1 – 2.3.2 with videos:

[Integrating Composite Trigonometric Functions by Substitution](#)

[Integrating Composite Exponential and Rational Functions by Substitution](#)

*Optional Review Chapter 4: Sections 1.1- 1.3

93 minutes of video time this week

Assignments

Week 1 Forums (2) :

Introductory Forum & Forum Week 1 Interpreting the Integration symbol

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

*Optional Review

Chapter 1:

Section 1; Power Rule,

2; Product and Quotient Rules,

3; Chain Rule

Complete ALL exercises in Thinkwell.

Review Summary Week 1 Forum

Week 2: The Basics of Integration

Learning Objective(s)

Course Objectives 1, 2

2.3 Illustrating Integration by Substitution

Solve composite trigonometric integrals by substitution

Solve composite integrals by substitution

2.4 The Fundamental Theorem of Calculus

Explain the method for approximating the area under a curve

Describe a Riemann sum; Explain the solution of the definite integral as the area under a curve

Describe Part I of the Fundamental Theorem of Calculus

Apply Part II of the Fundamental Theorem of Calculus to evaluate definite integrals

Reading and Videos

Sections 2.3.3 – 2.3.4 with videos:

[More Integrating Trigonometric Functions by Substitution](#)

[Choosing Effective Function Decompositions](#)

Sections 2.4.1 – 2.4.4 with videos:

[Approximating Areas of Plane Regions](#)

[Areas, Riemann Sums, and Definite Integrals](#)

[The Fundamental Theorem of Calculus, Part I](#)

[The Fundamental Theorem of Calculus, Part II](#)

71 minutes of video time this week

Assignments

Forum Week 2

Derivative of an integral

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 2 Forum

Week 3: The Basics of Integration and Applications of Integration

Learning Objective(s)

Course Objectives 1, 2

2.4 The Fundamental Theorem of Calculus

Apply Part II of the Fundamental Theorem of Calculus to evaluate definite integrals

Evaluate definite integrals

3.1 Motion

Apply integration to functions describing motion

Apply integration to functions involving gravitational acceleration

Apply integration to functions involving gravitational acceleration

3.2 Finding the Area between Two Curves

Find the area between two curves

Reading and Videos

Sections 2.4.5 – 2.4.6 with videos:

[Illustrating the Fundamental Theorem of Calculus](#)

[Evaluating Definite Integrals](#)

Sections 3.1.1 – 3.1.3 with videos:

[Anti-derivatives and Motion](#)

[Gravity and Vertical Motion](#)

[Solving Vertical Motion Problems](#)

Section 3.2.1 with video:

[The Area between Two Curves](#)

86 minutes of video time this week

Assignments

Forum Week 3

Head trauma application

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 3 Forum

Submit Assignment 1 before Sunday 11:55 pm EST

Complete Test 1 on Chapter 2

Basics of Integration

both in Sakai and in Thinkwell before Sunday 11:55 pm EST

Week 4: Applications of Integration

Learning Objective(s)

Course Objectives 1, 2

3.2 Finding the Area between Two Curves

Find the area bounded by two curves

Find the area bounded by two curves that intersect within the area;

Find the area between the x-axis and a curve below it

Find the area bounded by several curves

3.3 Integrating with Respect to y

Determine whether to find an area by integration with respect to y

Find the area between two curves by integration with respect to y

Find the area between two curves involving trigonometric functions

Reading and Videos

Sections 3.2.2-3.2.4 with videos:

[Limits of Integration and Area](#)

[Common Mistakes to Avoid When Finding Areas](#)

[Regions Bound by Several Curves](#)

Sections 3.3.1-3.3.3 with videos:

[Finding Areas by Integrating with Respect to \$y\$: Part One](#)

[Finding Areas by Integrating with Respect to \$y\$: Part Two](#)

[Area, Integration by Substitution, and Trigonometry](#)

81 minutes of video time this week

Assignments

Forum Week 4

Hidden Restrictions

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 4 Forum

Week 5: L'Hopital's Rule

Learning Objective(s)

Course Objective 3

14.1 Indeterminate Quotients

Evaluate limits with indeterminate forms

Understand when to apply L'Hôpital's rule

Understand when to apply L'Hôpital's rule

Apply L'Hôpital's rule to evaluate limits

14.2 Other Indeterminate Forms

Apply L'Hôpital's rule to evaluate limits with indeterminate products

Apply L'Hôpital's rule to evaluate limits with indeterminate differences

Reading and Videos

Sections 14.1.1-14.1.4 with videos:

[Indeterminate Forms](#)

[An Introduction to L'Hôpital's Rule](#)

[An Introduction to L'Hôpital's Rule](#)

[More Exotic Examples of Indeterminate Forms](#)

Sections 14.2.1-14.2.2 with videos:

[L'Hôpital's Rule and Indeterminate Products](#)

[L'Hôpital's Rule and Indeterminate Differences](#)

63 minutes of video time this week

Assignments

Forum Week 5

Negative area

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 5 Forum

Week 6: L'Hôpital's Rule

Learning Objective(s)

Course Objectives 3, 4, 5

14.2 Other Indeterminate Forms

Apply L'Hôpital's rule to evaluate limits of one to the infinite power

Apply L'Hôpital's rule to evaluate limits of one to the infinite power

15.1 Inverse Functions

Describe the exponential and natural log functions and their derivatives

Differentiate logarithmic functions and functions containing logs

Find derivatives using logarithmic differentiation

Define inverse functions; Identify inverse functions

Find the inverse of a function

*5.2 Exponential Functions

Evaluate exponential functions

Find derivatives of exponential functions

Uncover the hidden musical qualities of math

Uncover the hidden musical qualities of math

*5.3 Logarithmic Functions

Evaluate logarithmic functions

Find derivatives of logarithmic functions

Apply combinations of rules to find derivatives involving transcendental functions

Reading and Videos

Sections 14.2.3-14.2.4 with videos

[L'Hôpital's Rule and One to the Infinite Power](#)

[Another Example of One to the Infinite Power](#)

Sections 15.1.1-15.1.5 with videos:

[The Exponential and Natural Log Functions](#)

[Differentiating Logarithmic Functions](#)

[Logarithmic Differentiation](#)

[The Basics of Inverse Functions](#)

Finding the Inverse of a Function

*Optional sections & videos 5.2.1-5.2.3, 5.3.1-5.3.3

[Graphing Exponential Functions](#)

[Derivatives of Exponential Functions](#)

[The Music of Math](#)

[Evaluating Logarithmic Functions](#)

[The Derivative of the Natural Log Function](#)

[Using the Derivative Rules with Transcendental Functions](#)

80 minutes of video time this week

Assignments

Forum Week 6

Table of Integrals located in Thinkwell

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

* Optional Review 5.2-5.3:

Exponential & Logarithmic Functions

Functions and Their Inverses

Review Summary Week 6 Forum

Submit Assignment 2 before Sunday 11:55 pm EST

Complete Test 2 on Chapter 10 Integration Applications & Chapter 14 L'Hôpital's Rule

both in Sakai and in Thinkwell before Sunday 11:55 pm EST

Week 7: Functions and Their Inverses

Learning Objective(s)

Course Objective 5

15.2 The Calculus of Inverse Functions

Evaluate the derivative of an inverse function at a point

15.3 Inverse Trigonometric Functions

Describe the inverse trigonometric functions

Evaluate inverse trigonometric functions

15.4 The Calculus of Inverse Trigonometric Functions

Find the derivative of inverse trigonometric functions

Apply derivatives of inverse trigonometric functions

*15.5 The Hyperbolic Functions

Describe the hyperbolic functions

Prove a hyperbolic identity

Find derivatives of hyperbolic functions; Find derivatives involving hyperbolic functions

Reading and Videos

Section 15.2.1 with video

[Derivatives of Inverse Functions](#)

Sections 15.3.1-15.3.3 with videos:

[The Inverse Sine, Cosine, and Tangent Functions](#)

[The Inverse Secant, Cosecant, and Cotangent Functions](#)

[Evaluating Inverse Trigonometric Functions](#)

Sections 15.4.1-15.4.2 with videos:

[Derivatives of Inverse Trigonometric Functions](#)

[More Calculus of Inverse Trigonometric Functions](#)

*Optional sections 5.5.1-5.5.3 with videos

[Defining the Hyperbolic Functions](#)

[Hyperbolic Identities](#)

[Derivatives of Hyperbolic Functions](#)

62 minutes of video time this week

Assignments

Forum Week 7

Historical Calculus

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

*Optional sections 5.5

Hyperbolic Functions

Review Summary Week 7 Forum

Week 8: Techniques of Integration

Learning Objective(s)

Course Objectives 1, 6

16.1 Integration Using Tables

Use an integral table to solve integrals

Solve integrals using u-substitution

16.2 Integrals Involving Powers of Sine and Cosine

Solve integrals of powers of sine and cosine

Solve integrals of powers of sine and cosine

Solve integrals of powers of sine and cosine

16.3 Integrals Involving Powers of Other Trigonometric Functions

Solve integrals of other trigonometric functions

Reading and Videos

Sections 16.1.1-16.1.2 with videos:

[An Introduction to the Integral Table](#)

[Making u-Substitutions](#)

Sections 16.2.1-16.2.3 with videos:

[An Introduction to Integrals with Powers of Sine and Cosine](#)

[Integrals with Powers of Sine and Cosine](#)

[Integrals with Even and Odd Powers of Sine and Cosine](#)

Section 16.3.1 with video:

[Integrals of Other Trigonometric Functions](#)

60 minutes of video time this week

Assignments

Forum Week 8

Learning Calculus on-line

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 8 Forum

Submit Assignment 3 before Sunday 11:55 pm EST

Complete Test 3 on Chapter 15 Functions and Inverses

both in Sakai and in Thinkwell before Sunday 11:55 pm EST

Week 9: Techniques of Integration

Learning Objective(s)

Course Objectives 1, 6

16.3 Integrals Involving Powers of Other Trigonometric Functions

Solve integrals of other trigonometric functions using the Pythagorean

Solve integrals of other trigonometric functions using the Pythagorean identity

16.4 An Introduction to Integration by Partial Fractions

Solve integrals of rational expressions by decomposition to partial fractions

Solve integrals of rational expressions by decomposition to partial fractions

Solve integrals of rational expressions using polynomial long division

*16.5 Integration by Partial Fractions with Repeated Factors

Solve integrals of rational expressions with repeated linear functions

Solve integrals of rational expressions with repeated linear function

Solve integrals of rational expressions with repeated linear function

Solve integrals of transcendental functions by transformation to a rational function

16.6 Integration by Parts

Explain the procedure for integration by part

Reading and Videos

Sections 16.3.2-16.3.3 with videos

[Integrals with Odd Powers of Tangent and Any Power of Secant](#)

[Integrals with Even Powers of Secant and Any Power of Tangent](#)

Sections 16.4.1-16.4.3 with videos

[Finding Partial Fraction Decompositions](#)

[Partial Fractions](#)

[Long Division](#)

*Optional sections 16.5.1-16.5.4 with videos

[Repeated Linear Factors: Part One](#)

[Repeated Linear Factors: Part Two](#)

[Distinct and Repeated Quadratic Factors](#)

[Partial Fractions of Transcendental Functions](#)

Section 16.6.1 with video

[An Introduction to Integration by Parts](#)

65 minutes of video time this week

Assignments

Forum Week 9

Derivative without the Quotient Rule

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

*Optional section 16.5

Partial Fractions with repeated factors

Review Summary Week 9 Forum

Week 10: Techniques of Integration

Learning Objective(s)

Course Objectives 1, 6

16.6 Integration by Parts

Solve integrals using integration by parts

Solve integrals using integration by parts

Solve integrals using repeated integration by parts

Solve integrals using integration by parts and algebraic manipulation

16.7 An Introduction to Trigonometric Substitution

Explain how to solve integrals with radical expressions using trigonometric substitution

Solve integrals with radical expressions using trigonometric substitution

Solve integrals with rational powers using trigonometric substitution

Reading and Videos

Sections 16.6.2-16.6.5 with videos

[Applying Integration by Parts to the Natural Log Function](#)

[Inspirational Examples of Integration by Parts](#)

[Repeated Application of Integration by Parts](#)

[Algebraic Manipulation and Integration by Parts](#)

Sections 16.7.1-16.7.3 with videos

[Converting Radicals into Trigonometric Expressions](#)

[Using Trigonometric Substitution to Integrate Radicals](#)

[Trigonometric Substitutions on Rational Powers](#)

72 minutes of video time this week

Assignments

Forum Week 10

Horizontal Trig tangent

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 10 Forum

Week 11: Techniques of Integration

Learning Objective(s)

Course Objectives 1, 6, 7

16.8 Trigonometric Substitution Strategy

Find appropriate trigonometric substitutions to solve integrals

Solve definite integrals using trigonometric substitution

Solve definite integrals using trigonometric substitution

16.9 Numerical Integration

Derive the trapezoidal rule for approximating the area under a curve; Use the trapezoidal rule to estimate the area under a curve

Use the trapezoidal rule to estimate the area under a curve

Reading and Videos

Sections 16.8.1-16.8.3 with videos

[An Overview of Trigonometric Substitution Strategy](#)

[Trigonometric Substitution Involving a Definite Integral: Part One](#)

[Trigonometric Substitution Involving a Definite Integral: Part Two](#)

Sections 16.9.1-16.9.2 with videos

[Deriving the Trapezoidal Rule](#)

[An Example of the Trapezoidal Rule](#)

47 minutes of video time this week

Assignments

Forum Week 11

Critical Points

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 11 Forum

Week 12: Improper Integrals Applications of Integral Calculus

Learning Objective(s)

Course Objectives 1, 8, 9

17.1 Improper Integrals

Identify improper integrals of the first type

Identify improper integrals of the second type

Solve improper integrals using limits

18.1 The Average Value of a Function

Find the average value of a function

18.2 Finding Volumes Using Cross-Sections

Find volumes using integration

Find volumes using integration

Reading and Videos

Sections 17.1.1-17.1.3 with videos

[The First Type of Improper Integral](#)

[The Second Type of Improper Integral](#)

[Infinite Limits of Integration, Convergence, and Divergence](#)

Section 18.1.1 with video

[Finding the Average Value of a Function](#)

Sections 18.2.1-18.2.2 with videos

[Finding Volumes Using Cross-Sectional Slices](#)

[An Example of Finding Cross-Sectional Volumes](#)

60 minutes of video time this week

Assignments

Read only Week 12 Update

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 12 Forum

Submit Assignment 4 before Sunday 11:55 pm EST

Complete Test 4 on Chapter 15 Techniques of Integration

both in Sakai and in Thinkwell before Sunday 11:55 pm EST

Week 13: Applications of Integral Calculus

Learning Objective(s)

Course Objectives 1, 9

18.3 Disks and Washers

Find volumes of solids of revolution using the disk method along the x-axis

Find volumes of solids of revolution using the disk method along the y-axis

Find volumes of solids of revolution using the disk method

Find volumes of solids of revolution using the washer method along the x-axis

Find volumes of solids of revolution using the washer method along the y-axis

18.4 Shells

Find volumes of solids of revolution using the shell method

Find volumes of solids of revolution using the shell method

Reading and Videos

Sections 18.3.1-18.3.5 with video

[Solids of Revolution](#)

[The Disk Method along the y-Axis](#)

[A Transcendental Example of the Disk Method](#)

[The Washer Method across the x-Axis](#)

[The Washer Method across the y-Axis](#)

Sections 18.4.1-18.4.2 with videos

[Introducing the Shell Method](#)

[Why Shells Can Be Better Than Washers](#)

85 minutes of video time this week

Assignments

Forum Week 13

Derivatives of Absolute Value

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

Review Summary Week 13 Forum

Week 14: Applications of Integral Calculus

Learning Objective(s)

Course Objectives 1, 9

18.4 Shells

Find volumes of solids of revolution using the shell method along the y-axis

18.5 Arc Lengths and Functions

Explain how to find the length of an arc

Find the length of an arc defined by a given function

18.6 Work

Explain work as a definite integral of a force function

Solve for work as a definite integral of a force function

Use Hook's law and the definite integral to solve for work done on a spring

*18.7 Moments and Centers of Mass

Define the center of mass of a system of points; Calculate the center of mass of a system of points

Find the center of mass of a thin plate

Reading and Videos

Section 18.4.3 with video 18.4.3

[The Shell Method: Integrating with Respect to y](#)

Sections 18.5.1-18.5.2 with videos

[An Introduction to Arc Length](#)

[Finding Arc Lengths of Curves Given by Functions](#)

Sections 18.6.1-18.6.3 with videos

[An Introduction to Work](#)

[Calculating Work](#)

[Hooke's Law](#)

*Optional sections and videos

18.7.1-18.7.2

Center of Mass

[The Center of Mass of a Thin Plate](#)

51 minutes of video time this week

Assignments

Read only Week 14 Update

Watch assigned videos, read transcript, study notes and worked problems in Thinkwell.

Complete ALL exercises in Thinkwell.

* Optional sections 18.7:
Moments and Center of Mass

Review Summary Week 14 Forum

Week 15: Complete last test, Course review

Learning Objective(s)

Complete test for Ch 17 & 18

Review ALL course material and videos of troublesome topics to prepare for the final examination

Reading and Videos

976 minutes of video total time for entire course

Assignments

Forum Week 15
Using Complex Numbers in the real world.

Review Summary Week 15 Forum

Submit Assignment 5 before Sunday 11:55 pm EST

Complete Test 5 on Chapter 17 Improper Integrals & Chapter 18 Applications of Integral Calculus

both in Sakai and in Thinkwell before Sunday 11:55 pm EST

Week 16: Final Examination

Learning Objective(s)

Demonstrate your knowledge of calculus

Reading and Videos
Assignments

Review Summary Week 16 Forum

Complete And submit Final Exam in both Thinkwell and Sakai

Evaluation

Staying on task and adhering to the published schedule are typically among the most challenging aspects of completing an academic course successfully. This is especially true for on-line and part-time non-resident programs. To avoid the pitfall of falling behind, students in this course should complete the assigned reading, and exercises in the Thinkwell environment. Students should also complete the Suggested Practice Problems as set forth in the schedule provided in the Course Outline of this syllabus.

Student grades for the course will be based on active weekly forum entries, watching videos and completing Thinkwell exercises, completing weekly assignments, submitting five tests and one final examination. You must complete all items to successfully master all skills in this course.

The Week 1 Introduction Forum: During the first week of class each student must make a post to the Week 1 Introduction Forum. You are to use this Forum to introduce yourself and state your goals and objectives as they relate to our course. You are required to make a post to the Week 1 Introduction Forum in order to complete your enrollment in the course. Your post must be **at least 250 words**, and you must complete it by the end of the first week. This is a university requirement. To make a post to the Week 1 Introduction Forum, click on the Forum topic link, then click Post New Thread. In the title block of the dialog box that appears kindly insert your first and last name; compose your post in the message box; and then click Post Message.

Besides completing your enrollment in the course, the Week 1 Introduction Forum is designed to 1) build peer-to-peer relationships by introducing oneself and one's background to the class; 2) to articulate individual student learning goals and/or expectations for the class. Therefore, in your introduction you may wish to touch upon the following:

1. Who you are and how you would like to be addressed.
2. Your academic major or program of study.
3. Your current status in your program of study.
4. Your academic goals including why you are taking this course and what you hope to achieve by completing it.
5. Other information about yourself that you would like to share and might help others know you better.

Chapter Tests: The chapter tests will cover two short or one long chapter as they are completed. These tests will be taken on-line in the classroom. They will be open book and open note tests. However, you may not receive help from any other person. These tests will be assigned early in the week and will be due by the end of the week. The exact dates are noted later in this student guide. These tests will represent 60 percent of the student's course grade.

There are practice exercises, some in Thinkwell and others in Sakai for each of the text chapters covered. These practice problems are focused on the reading and study material for each week. After completing your assigned reading and viewing the appropriate weekly videos, you should complete those problems in order to ensure you have mastered the material covered. They are not graded, but will be discussed through the weekly forums per student questions. If you do not feel that you have mastered the topics sufficiently, please

feel free to explore additional problems which you can also introduce into our weekly forums. You can also post your solutions on a weekly forum for input from other students and me.

Weekly Forums: The weekly discussion forum is for students to answer my session topic and for students to post their questions on course content for that week. Successful students find that this is an excellent resource.

The Cumulative Final Exam will be taken during the last week of the semester (25 points). It will be a three-hour exam. It will be open book and open notes and it will be on-line. It is highly recommended that you use a calculator. Students are required to submit the precise 3 hour time block that they will take the final exam during the last week of class. This time and date should be submitted during the 7th week of the semester. Unless the professor approves alternate arrangements, students should plan to take the final examination during the 16th week of the course.

Students' final grades will be posted as soon as the instructor receives and evaluates the final exam. Official grades will continue to be issued by the University on the grade report form. Professors have 7 days from the end of the semester to submit their grades to the University.

Please see the [Student Handbook](#) to reference the University's [grading scale](#).

The points earned on the graded course assignments will determine the course grade. The final grade in the course will be based on total points. Grades will be assigned based on the following term composite scores:

Grading:

Name	Grade %
Forums	5.00 %
Introductory Forum	0.46 %
Forum Week 1	0.46 %
Forum Week 2	0.46 %
Forum Week 3	0.23 %
Forum Week 4	0.46 %
Forum Week 5	0.46 %
Forum Week 6	0.46 %
Forum Week 7	0.46 %
Forum Week 8	0.23 %
Forum Week 9	0.46 %
Forum Week 10	0.46 %
Forum Week 11	0.46 %
Forum Week 13	0.46 %
Forum Week 15	0.23 %
Forum Week 16	0.23 %
Assignments of Thinkwell Exercises	10.00 %
APUS Honor Code and Pledge	1.00 %
Assignment 1	2.00 %
Assignment 2	2.00 %
Assignment 3	2.00 %
Assignment 4	2.00 %
Assignment 5	2.00 %
Test Critiques	60.00 %
Test 1 Critique	12.00 %
Test 2 Critique	12.00 %
Test 3 Critique	12.00 %
Test 4 Critique	12.00 %

Test 5 Critique	12.00 %
Final Exam	25.00 %
Final Examination	25.00 %

Materials

Book Title: Thinkwell Calculus Online Materials - Thinkwell will send a user name and password to your primary email address. Instructions provided inside the classroom.

Author:

Publication Info: Thinkwell

ISBN: THINKWELL-CALC

Additional Resources

You will need, and are encouraged to use, a graphing calculator to successfully complete this course. At your discretion, you may use a scientific or graphing calculator, or the calculator on your computer that is capable of performing these functions. Microsoft² has a free on-line calculator, as listed below. You may use these tools for all graded assignments and examinations during the course.

Tutorials³: These tutorials include 4-6 minute vignettes on many course topics for both Calculus I and Calculus II, written by the course lead and are focused on the weekly course objectives. In addition, students have also found Khanacademy⁴ and PatrickJMT⁵ tutorials helpful. Students may access these videos by clicking on Cntrl+Click on the link.

Web Sites

The following public domain web sites are useful. Please abide by the APUS University's academic honesty policy when using Internet sources, as well. Note web site addresses are subject to change.

Site Name	Website URL/Address
Thinkwell 1	https://www.thinkwell.com/account/signin
On-line graphing calculator 2	Microsoft Mathematics 4.0
APUS WV tutorials 3	http://www.apus.edu/media/mathWV/calculus.htm
Khanacademy 4	https://www.khanacademy.org/
PatrickJMT 5	http://patrickjmt.com/topic/calculus/

Textbook

There is no required traditional or on-line textbook for this course. Any traditional introductory calculus textbook from the library or on-line should cover the topics for this class.

If you would feel more comfortable with an on-line textbook, one is available in the library at APUS. To access, simply follow the instructions below:

1 While in the classroom, from the left menu tab click APUS Library.

2 Type in ... "calculus", then click Search.

3 From the first entry, "#1 Sarah Channon 2009", click on Full text on-line

4 Click on PDF full text. Using the page number blank at the top of the page, type in the desired section:.

Calculus I

Introduction begins on page 3
Functions begins on page 6
Limits begins on page 23
Differentiation begins on page 39

Calculus II

Integration on page 85

Calculus III

Infinite series on page 155
Multivariable Calculus on page 172
Extensions on page 262

Alternately you could click this link [Calculus by Sarah Channon](#), and click on the first title.

Thinkwell does have a book available which is a compilation of problems. There are no lessons included in this book. All of the problems, plus additional problems are already available on-line in Thinkwell. You will need to contact Thinkwell directly to make this purchase.

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Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- [Tutor.com](#) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some

cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.