

M6 Additional Mathematics

Course Syllabus - 2025 Term 2

Teacher: Les Smith

Department: Mathematics

Periods per week: 4

Credits: 2.0

Subject Code: MA33202

Course Description

This course will focus on integral calculus as students will learn about area under a curve, the connection between derivatives and integrals, and integration techniques. The course will begin with students learning how to estimate the area under a curve. They will then learn about integrals and the Fundamental Theorem of Calculus. They will study a variety of integration techniques. The course will conclude with students learning how to apply definite integrals to find areas between two curves and volumes of rotation.

Course Content

4. Unit 4: Definite Integrals

- 4.1. Estimating Area with Finite Sums
- 4.2. Definite Integrals
- 4.3. Antiderivatives
- 4.4. Fundamentals Theorem of Calculus

5. Unit 5: Methods of Integration

- 5.1. Slope fields
- 5.2. Antidifferentiation by Parts
- 5.3. Tabular Integration
- 5.4. Separable differential Equations

6. Unit 6: Applications of Integration

- 6.1. Integrals as Net Change
- 6.2. Areas in the Plane and Volume
- 6.3. Length of Curves
- 6.4. Applications from Science and Statistics

Learning Outcomes

Integration

- Find an antiderivatives of a function
- Solve initial value problems.
- Evaluate indefinite integrals.
- Apply the left endpoint, right endpoint and midpoint approximation methods to estimate the area under a curve.
- Evaluate the definite integral of a function by finding the limit of a Riemann sum.
- Evaluate definite integrals using the Fundamental Theorem of Calculus.
- Evaluate indefinite integrals using u-substitution.

Applications of Definite Integrals

- Calculate the vertical area between two curves.
- Calculate the horizontal area between two curves.
- Integrate areas of cross-sections to calculate the volume of a solid.
- Apply the disk method to find the volume of a solid of revolution.
- Apply the washer method to find the volume of a solid of revolution.

Transcendental Functions

- Find derivatives of exponential and logarithmic functions.
- Find integrals involving exponential and logarithmic functions.
- Apply integration by parts to find definite integrals of exponential, logarithmic and trigonometric functions
- Apply u-substitution to find definite integrals of exponential, logarithmic and trigonometric functions.

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Learning Resources

- Thomas' Calculus (12 ed.)
- Calculus: Graphical, Numerical, Algebraic (Finney, 4th ed.)
- Desmos online graphing calculator and guided tasks
- GeoGebra graphing calculator
- Google Suite: Forms, Slides

Assessment Methods

Guided Practice and Assignments (30%)

The guided practice must be submitted on the due date for full credit.

Workbooks: submit after completing both guided practice and the assignment. The workbook will be submitted with the mastery check after it has been taken. In some cases, if time permits, the workbooks will be submitted before the mastery check.

Late: If the workbook is submitted afterward the due date and time, an automatic 20% reduction will be applied. If you're absent without informing the teacher, the 20% reduction will be auto applied. If you did inform the teacher of your absence no loss of points will be incurred. After the initial 20%, a 10% reduction will be applied until 50% after which, if complete, the maximum score available is 50%.

Knowledge Check (10%)

Online forms: If the knowledge check is submitted after I have checked the form submission, you will lose points for the entire form.

Mastery Checks and Quizzes (20%)

These are paper based. You can use your Guided practice and Assignment workbook during the check. The mastery check and workbook will be submitted at the same time. In some cases the workbook will be submitted before the check

Enrichment (extra credit)

These assignments are also located in the workbook. Completing them will be extra credit or varying amounts. The extra credit applied will not be more than the total point for the student work. It will be used to raise the point values for any points lost.

Unit Tests (10%)

Closed book summative assessment. 50 min at the end of each unit.

Evaluation Breakdown

Student Work	Guided Practice, Assignments 30%	Semester 2 Gradables
	Knowledge Check 10%	
	Enrichment EC	
	Total: 40%	
Assessments	Quizzes 20%	
	Unit Tests 10%	
	Total: 30%	
Final Exam	Total: 30%	