

MATH104ES : *Skills for College Success in Calculus and Analytic Geometry II

General Information

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Course Code (CB01) :	MATH104ES
Course Title (CB02) :	*Skills for College Success in Calculus and Analytic Geometry II
Department:	MATH
Proposal Start:	Fall 2025
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000650534
Curriculum Committee Approval Date:	10/23/2024
Board of Trustees Approval Date:	12/17/2024
Last Cyclical Review Date:	10/23/2024
Course Description and Course Note:	MATH 104ES is a course that's meant to complement MATH 104E. Students develop essential study techniques to be successful in calculus and analytic geometry. Topics include algebra, trigonometry, limits, derivatives, and integrals. Note: This course is Pass/No Pass only.
Justification:	New Course
Academic Career:	<ul style="list-style-type: none">Credit
Mode of Delivery:	No value
Author:	<ul style="list-style-type: none">Demirchyan, Gevork
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none">Mathematics
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Pass / No-Pass Only

Course Support Course Status (CB26)

Course is a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Not transferable

Transferability Status

Not transferable

Units and Hours

Summary

Minimum Credit Units (CB07)	1
Maximum Credit Units (CB06)	1
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	0
Total Student Learning Hours	54

Credit / Non-Credit Options

Course Type (CB04)

Credit - Not Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education

Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	0	0
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	0

Laboratory	54
Studio	0
Total	54

Course Out-of-Class Hours

Lecture	0
Laboratory	0
Studio	0
Total	0

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Co-Requisite

MATH104E - Calculus and Analytic Geometry II

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
MATH 104EN	No Value

Specifications

Methods of Instruction

Methods of Instruction Laboratory

Methods of Instruction Discussion

Methods of Instruction Tutorial

Methods of Instruction Collaborative Learning

Methods of Instruction Guest Speakers

Methods of Instruction Presentations

Out of Class Assignments

- Reading and working exercises (e.g. working selected problems from textbook exercise sets)
- Projects

Methods of Evaluation

Rationale

Other Worksheets reinforcing calculus techniques

Project/Portfolio Projects

Exam/Quiz/Test Quizzes

Textbook Rationale

The Just-in-Time Algebra textbook is the most recent published edition the covers the material included in this course. The Calculus Volume II textbook is the most recent version on the textbook and the best version of an OER Calculus II textbook.

Textbooks

Author	Title	Publisher	Date	ISBN
Mueller & Brent	Just-in-Time Algebra and Trigonometry for Early	Pearson	2013	9780321671035

Transcendentals Calculus

Jay Abramson	Precalculus	OpenStax	2021	9781711493992
Gilbert Strang	Calculus Volume I	OpenStax	2020	9781506698069
Gilbert Strang	Calculus Volume II	OpenStax	2016	9781506698076

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Determine the area between curves, the average value, and arc length of a function.

Determine the volumes of solids of revolution using the disk method, the cylindrical shell method, and the cross-section method.

Determine work done in applications involving liquids and springs.

Evaluate definite and indefinite integrals using a variety of techniques, including integration by parts, trigonometric substitution, and partial fractions.

Evaluate improper integrals.

Find approximations to definite integrals using midpoint, trapezoidal and Simpson techniques.

Model differential equations.

Solve separable differential equations.

Work with exponential and logistic models of growth and decay.

Graph conic sections.

Determine divergence or convergence of infinite sequences and series by applying convergence tests.

Represent functions as power series and determine their radius and interval of convergence.

Differentiate and integrate power series.

Find Taylor and Maclaurin series for a function.

Differentiate and integrate polar and parametric functions.

Graph equations in polar and parametric form.

SLOs

Successfully collaborate on assignments in calculus II.

Expected Outcome Performance: 70.0

Utilize calculus techniques to solve problems.

Expected Outcome Performance: 70.0

Course Content

Lecture Content

No value

Laboratory/Studio Content

Mathematical Review Content (27 hours)

- Algebra review
 - Partial fraction decomposition
 - Sequences and series
 - Sigma notation
- Trigonometric review
 - Trigonometric identities
 - Half-angle formula
 - Sum-to-product and product-to-sum formulas
 - Power reduction
 - Polar coordinates
 - Trigonometric equations
- Graphing review

- Trigonometric functions
- Polar equations

Calculus I Review Content (14 hours)

- Limits
 - Difference quotients
 - L'Hopitals rule
 - Limits from graphs
 - Limits at infinity
- Derivatives
 - Rules of differentiation
- Integrals
 - Basic definite and indefinite integrals
 - Fundamental theorem of calculus
 - Substitution rule
- Calculus applications
 - Graphing
 - Optimization

Calculus II Content (13 hours)

- Derivatives
- Volumes
 - Disk method
 - Shell method
 - Washer method
- Length of curves
- Surface area
- Integrals
 - Integration by parts
 - Trigonometric integrals
 - Trigonometric substitution
 - Partial fractions
 - Numerical integration
 - Improper integrals
- Sigma notation
- Series and convergence tests
 - Divergence test
 - Integral test
 - Direct and limit comparison tests
 - Alternating series test
 - Ratio Test
 - Root Test
- Sequences
- Calculus applications
 - Volumes
 - Physics
 - Work
 - Hydrostatic pressure

Total hours: 54

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

No

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

No Value

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liaison?

No Value

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value