MATH 1131 - Calculus I (version 201312L)

Course Title	Course Development	Learning Support
Calculus I	Standard	No

Course Description

Topics include the study of limits and continuity, derivatives, and integrals of functions of one variable. Applications are incorporated from a variety of disciplines. Algebraic, trigonometric, exponential, and logarithmic functions are studied.

Pre-requisites

Regular Admission and MATH 1113 with a C or better OR appropriate math placement test score.

Regstr. Co-requisites

Regstr. Co-requisites: None

True Co-requisites

True Co-requisites: None

Course Length

	Lecture Contact Time	Regular Lab Type	Reg. Lab Contact Time	Other Lab Type	Oth. Lab Contact Time	Total Contact Hrs
Contact Hours Per Week	**4 hrs**	**N/A**	**0 hrs**	**N/A**	**0 hrs**	**4 hrs**
Contact Min/Hrs Per Semester	**3000 min**		**0 min**		**0 min**	**60 hrs**

	Lecture Credit Hours	Lab Credit Hours	Total Credit hours	WLU
Semester Credit Hours	**4**	**0**	**4**	**135**

Competencies & Outcomes

Order	Description

1 **Derivatives and Applications**

Order	Description	Learning Domain	Level of Learning
1	Calculate limits of functions	Cognitive	Application
2	Understand the definition of continuity.	Cognitive	Comprehension
3	Differentiate algebraic, trigonometric, exponential, and logarithmic functions.	Cognitive	Analysis
4	Apply the Chain Rule.	Cognitive	Application
5	Perform implicit differentiation.	Cognitive	Synthesis
6	Calculate higher derivatives.	Cognitive	Application
7	Solve related rate problems.	Cognitive	Application
8	Understand the Mean Value Theorem.	Cognitive	Comprehension
9	Apply the Mean Value Theorem.	Cognitive	Application
10	Apply the First Derivative Test.	Cognitive	Application
11	Apply the Second Derivative Test.	Cognitive	Application

12	Determine the critical numbers and points of inflection.	Cognitive	Application
13	Solve optimization problems.	Cognitive	Application

2 **Introduction to Integration and Applications**

Order	Description	Learning Domain	Level of Learning
1	Find the most general antiderivative of a function.	Cognitive	Knowledge
2	Understand and use sigma notation.	Cognitive	Comprehension
3	Calculate area using the limiting value of approximating polygons.	Cognitive	Application
4	Understand the definition of definite integral.	Cognitive	Comprehension
5	Apply the properties of definite integrals.	Cognitive	Application
6	Apply both parts of the Fundamental Theorem of Calculus.	Cognitive	Application
7	Apply the Substitution Rule for integrals.	Cognitive	Application
8	Calculate the area between two given curves in a plane.	Cognitive	Application
9	Calculate volumes using the disk method and method of cylindrical shells.	Cognitive	Application