

**Calculus II
MATH222**

This course is a continuation of Calculus I (MATH221). Topics include the Second Fundamental Theorem of Calculus, methods of integration, integration of transcendental functions, differential equations, indeterminate forms, L'Hopital's Rule, improper integrals, and applications.

Prerequisite: C- or higher in Calculus I (MATH221) or waiver by placement testing results or Departmental Approval.

COURSE OUTCOMES	OUTCOMES ACTIVITIES
At the end of this course, students will be able to	
Integrate algebraic and trigonometric functions in order to develop the techniques necessary to solve applied problems.	<ol style="list-style-type: none"> 1. Use the Second Fundamental Theorem of Calculus. (CT, QS, R, TS) 2. Evaluate integrals using change of variable and substitution. (CT, QS, R, TS) 3. Evaluate definite integrals using integration rules. (CT, QS, R, TS)
Differentiate and integrate exponential, logarithmic, and inverse trigonometric functions in order to solve applied problems.	<ol style="list-style-type: none"> 1. Use differentiation rules for inverse trigonometric functions. (CT, QS, R, TS) 2. Use integration formulas for logarithmic and exponential functions. (CT, QS, R, TS) 3. Evaluate integrals that result in inverse trigonometric functions. (CT, QS, R, TS)
Solve applied problems using differentiation and integration.	<ol style="list-style-type: none"> 1. Solve differential equations using separation of variables. (CT, QS, R, TS) 2. Find the area of the region between two curves. (CT, QS, R, TS) 3. Find the volume of a solid of revolution by the disc or washer method or by the shell method. (CT, QS, R, TS)
Demonstrate an understanding of various integration techniques in order to solve many different types of integrals.	<ol style="list-style-type: none"> 1. Solve problems using the basic integration formulas. (CT, R, QS) 2. Solve problems using integration by parts. (CT, R, QS) 3. Solve problems involving trigonometric integrals and those involving trigonometric substitution. (CT, R, QS) 4. Solve problems involving partial fractions. (CT, R, QS) 5. Solve problems using integration tables. (CT, R, QS)
Demonstrate an understanding of the concept of indeterminate forms in order to solve application problems.	<ol style="list-style-type: none"> 1. Solve problems using L'Hôpital's Rule. (CT, R, QS) 2. Determine when L'Hôpital's Rule does not apply. (CT, R, QS) 3. Determine the divergence or convergence of an improper integral. (CT, R, QS) 4. Evaluate an improper integral that converges. (CT, R, QS)
Strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.	Referenced above

**Indicate the Core Competencies that apply to the outcomes activities and assessment tools: Critical Thinking (CT); Technology Skills (TS); Oral Communications (OC); Quantitative Skills (QS); Reading (R); Writing (W).