

Course Outcomes Guide (COG)

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course Title: Math 205, Calculus III

Date: Fall 2011

Course Team: Christopher Lewis

Expected Learning Outcomes

In this course students will acquire:

- 1) **TECHNICAL COMPETENCY** in the methods of calculus that will enable them to find limits, derivatives and integrals of multiple variable functions and vector-valued functions, as well as recognize the setting in which the result applies. *(Supports Mathematics Program Outcomes 1 and 5)*
- 2) **CONCEPTUAL UNDERSTANDING** of limits, continuity, differentiation and integration of multiple variable functions and vector-valued functions and the theorems that relate these topics. Conceptual understanding will be developed by requiring students to view and understand these topics and their related theorems from numeric, geometric, algebraic and written/verbal perspectives. **(The Rule of Four)**. Students will be required to provide heuristic and visual justification of important results. In a few select, elementary instances students will be required to provide rigorous justification. *(Supports Mathematics Program Outcomes 1, 2, 4, 5, 6 and 7)*
- 3) **UTILITY** in the methods of multivariable and vector calculus. Students will use multivariable and vector calculus to solve applied problems from a variety of disciplines ranging from biology, economics, business, engineering, and the social sciences, but primarily focusing on applications from physics and mathematics. *(Supports Mathematics Program Outcomes 1, 2, 4, 5, 6 and 7)*

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

The students demonstrate achievements of each outcome by completion of 10 quizzes, 3 exams, and a final exam. There is only one instructor for the course, so there is uniformity in assessment and instructional delivery.

Starting in the Spring 2012 common problems from the exams, correlated with the learning outcomes will be selected and administered from semester to semester. Results will be analyzed for the purpose of improving instructional delivery.

Validation (What methods have you used or will you use to validate your assessment?)

The common assessment will test student achievement of the learning outcomes. Validity to a large part is then determined by the appropriateness of the topics and the learning objectives, which, based on studying course descriptions of Calculus III of 4 year transfer colleges and universities, are comprehensive and complete..

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

Data will be available at the end of the Spring 2012 semester.

Follow-up (How have you used or how will you use the data to improve student learning?)

Starting in the Spring 2012 common problems from the exams, correlated with the learning outcomes will be selected and administered from semester to semester. Results can then be analyzed for the purpose of improving instructional delivery.

Budget Justification (What resources are necessary to improve student learning?)

No budget resources are anticipated.