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 204, Calculus II   **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 apply the various techniques of integration to evaluate indefinite, definite and improper integrals, and determine arc length, surface area and volume, as well as apply calculus to parametric and polar coordinate equations. Students will be able to apply a variety to tests to determine convergence/divergence of sequences and series. Students will also be able to represent functions by power series, determine intervals to convergence, and provide estimates of error. *(Supports Mathematics Program Outcomes 1, 2,4 and 5)*

2) **CONCEPTUAL UNDERSTANDING** of the formulas, techniques and theory that are developed. Conceptual understanding will be reinforced 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. *(Supports Mathematics Program Outcomes 1, 2, 4 5, 6 and 7)*

3) **UTILITY** in the methods of calculus. Students will use 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)*

*Graphing calculators and TEC will help support student learning outcomes.

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

The common assessment that was developed consists of five problems that test the learning outcomes of technical competency, conceptual understanding, and utility in the methods of calculus.

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

The common assessment tests student achievement of the learning outcomes, which are directly correlated with over 50 content objectives on the topical outline of the common syllabus. Validity to a large part is then determined by the appropriateness of the topics and the content objectives for the topics. For this reason a contemporary, widely used, comprehensive, and highly regarded text by James Stewart was selected for the course. The emphasis is on understanding concepts, an outgrowth of the current calculus reform movement.

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

The common assessment was administered for Spring 2011 and Summer 2011 classes. The data is being analyzed and results will be available this fall for general discussion by the math faculty with recommendations made to improve instruction.

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

The common assessment was administered for Spring 2011 and Summer 2011 classes. The data is being analyzed and results will be available this fall for general discussion by the math faculty with recommendations made to improve instruction.

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

No budget resources are anticipated.