DEPARTMENT OF MATHEMATICS SOUTHEAST MISSOURI STATE UNIVERSITY

SYLLABUS

GI 624 AP INSTITUTE: CALCULUS BC DATE: Spring 2005

I. Catalog Description: This institute assists secondary school mathematics teachers in offering an Advanced Placement Calculus course in their schools. The institute is taught over a one or two-week period for a total of 45 hours. (3)

II. Prerequisites: Mathematics teacher certificate.

III. Objectives of Course:

1. To review the concepts and methods of calculus and analytic geometry.
2. To explore the implications of calculus reform for AP Calculus-BC course.
3. To understand the current status of technology and the AP Calculus examination.
4. To develop a syllabus for the AP Calculus-BC course they will be teaching.
5. To integrate appropriate technology into their AP Calculus syllabus.
6. To model the teaching of concepts and methods in the AP Calculus-BC syllabus.
7. To examine some of the non-routine and abstract applications of calculus.
8. To examine the effect of TIMSS on the teaching of Calculus.

IV. Expectations of Students: Participants are expected to attend classes, participate in classroom discussions and presentation activities, and complete homework assignments.

V. Course Outline:

The workshop will cover the topics in the Advanced Placement Calculus BC course.

1. Functions in Parametric, Polar, and Vector forms; Graphs and Limits
2. Derivatives: their computation and applications
3. Integrals: interpretation, applications, and numerical approximations
4. Polynomial Approximation and Series
5. Series of constants: concepts and convergence-tests; Taylor series
6. Review of all topics in GI-623 (AP- Calculus-AB course syllabus)

VI. Textbook: (1) *Advanced Placement Course Description: Mathematics (Calculus AB and BC),* The College Board, May 2004, and (2) *Calculus, 5e Edition* by James Stewart, Brooks Cole, 2003

VII. Basis of Student Evaluation:

25 % Participation in classroom discussion
25 % Presentations of selected topics
25 % Reviews of current literature regarding calculus education
25 % Syllabus for the AP Calculus course they will be teaching