

A Georgia Initiative: Calculus, TI-92, Distance Learning And Support via the Internet

Cindy Gonzalez, Mary Maraget Hoy, and Sharon Barrs

Department of Mathematics

Georgia Southern University

Statesboro, GA 30460

Cindygon@gsvms2.cc.gasou.edu

During the 1996-97 academic year the Board of Regents of the University System of Georgia funded a project for the writers to redesign the existing Calculus I/Analytical Geometry course at Georgia Southern University. It is intended that this course be offered as a college credit course to talented students in Georgia high schools who did not have access to an Advanced Placement Calculus Course. The state's interactive distance learning network was used to reach the high school students while the TI-92 was used to fulfill the computer laboratory requirements mandated by the Calculus I course description in the University Catalog. Each class was made up of college students at the Georgia Southern local site and high school students at the remote site(s). The course was successfully delivered from Georgia Southern during Fall Quarter 1996 and Spring Quarter 1997.

As a result of the success of the project, the Board of Regents awarded additional grant moneys for the 1997-98 academic year to enable the writers to start "packaging" the course materials for use by instructors throughout the whole University System. The writers plan to include instructional support for this package via the internet.

Course Description

The technology was fully integrated into the course. The TI-92 is uniquely suited for use in the distance learning environment. The design of its viewscreen allows the contents of any instructor or student calculator to be seen by the entire class, thus increasing interaction between sites and allowing presentations of course projects. The TI-92 provides the students with access to technology at home which allows for more time for student experimentation and produces a shorter learning curve in the use of the technology. Through the use of the graphing, data, and interactive geometry features of the calculator, instructors are able to demonstrate abstract topics on the television screen and to present mathematical topics from a holistic point of view by having the students relate symbolic, numerical and graphical representations of a problem. The calculator allows the students to perform the cumbersome calculations involved in the mathematics of "real-world" applications, enabling them to experience solving problems relevant in today's world. The TI-92 calculator/computer has proven to be a viable alternative to the computer laboratory and to have a positive effect on student learning outcomes.

Packaging Plan

Although course materials for teaching with the TI-92 were designed to be used for delivery via a distance learning network, they can easily be adapted for use in a traditional classroom setting. These materials are "text book independent" and designed to be used in conjunction with a traditionally structured Calculus I text. For each topic in a traditional Calculus I course, a "teaching module" will be provided. Each module will include:

- (1) a detailed lesson for that topic which could be copied and given to each student as an interactive handout,
- (2) suggestions for distance learning delivery techniques for the instructor,
- (3) appropriate TI-92 exercises for the topic,
- (4) suggestions for out of class assignments and projects when appropriate.

Special sample test questions will be provided to demonstrate how to approach testing students using this new technology. Programs for the interactive geometry presentations will also be supplied.

Potential Adopters for the Course

- (1) Instructors/Institutions who wish to offer Calculus I via Georgia's distance learning network
- (2) Instructors/Institutions who wish to offer Calculus I using the TI-92 calculator/computer in lieu of a computer laboratory

Support Provided for Adopters

Course materials, new activities and results will be shared via a listserv between writers and adopters of the course. A website will contain introductory material about the project and provide links to sites with distance learning and TI-92 calculator information. Readers on the web will have the opportunity to send an e-mail request on line for more information, give comments and suggestions, or contribute course materials. In addition, the web page will provide the opportunity to download course materials available in a variety of formats including PDF format (which is cross-platform), Microsoft Word for Macintosh, or Microsoft Word for Windows. Course materials will also be available on floppy diskettes or hard copy if requested.