

**CGEP - Dedicated Distance-Education Instruction\*\***  
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This Fall, 2008, it will be my pleasure to again teach Engineering Mathematics I on TV through the Commonwealth Graduate Engineering Program [CGEP]. Indeed, it will mark the tenth occasion that I have taught either Engineering Mathematics I or Engineering Mathematics II as graduate distance-education courses through CGEP.



The Program in Applied Mathematics [APMA] coordinates and administers mathematics instruction to undergraduate students and graduate students in all departments of the School of Engineering and Applied Science at the University of Virginia. The mathematical tools and expertise developed in these APMA courses, including the graduate Engineering Mathematics I and II courses, are essential to the professional development of the engineer and applied scientist. This instruction forms the core of the analytical-mathematical component of an engineering and applied science education and lays the foundation for ongoing professional development.

**Question:**

Why should we teach the graduate Engineering Mathematics I and II courses on TV through CGEP to distance-education students?

**Answer:**

The professional careers of many active engineers depend strongly on the analytical skills and mathematical expertise developed in Engineering Mathematics I and II. To be sure, Engineering Mathematics I and II help students learn in more depth and retain more completely the underlying mathematics needed in subsequent higher-level engineering courses. Engineering Mathematics I and II help students become more confident as their mathematical knowledge and abilities are improved to enhance their engineering skills.

If we believe that the graduate Engineering Mathematics I and II courses are essential to the professional development of the engineer and applied scientist and if we believe that this instruction forms the core of the analytical-mathematical component of an engineering and applied science education and lays the foundation for ongoing professional development, should we not reach out through CGEP to those dedicated distance-education students who need this mathematics instruction to be successful in their professional work and in their careers?

A little over a decade ago when I made the decision to teach my first TV course through CGEP, this above question was one of a handful of questions asked of me by a colleague who was critical of the distance-learning process. He was quick to point out that substantial extra effort was needed to teach CGEP courses. Other related questions asked of me over the years penetrate to the depths of the fundamental importance of CGEP distance-learning. Some of these questions and answers, restated below, point to the question: “Why should a professor consider teaching through CGEP?”

**Question:**

Could you address the rumor that the effort of teaching distance-education students on TV requires double or triple the effort of teaching on-campus students in the regular classroom setting?

**Answer:**

It is true when teaching for the first time on TV that substantial extra work is required; but for subsequent teaching of the same course on TV the extra required work is less.

For Engineering Mathematics I and II, there are several needed preparations which increase dramatically the effort required by the professor when teaching for the first time on TV. In the distance-learning setting, detailed lecture notes are essential for the students to have in hand prior to each lecture in order for the students to be able to more easily follow the lecture. These must be prepared by the professor and posted online prior to each class. Detailed solutions to all homework and other selected problems must be prepared and posted online each week. Detailed solutions to all Test problems also must be prepared and posted online shortly after the Tests are completed. These detailed preparations and postings are not as stringent for an on-campus course in the regular classroom setting.

Finally, the delay times in receiving the homework assignments and the Tests from the remote TV Sites for grading can be as much as several days to a week. Sometimes considerably greater delay times are experienced for those distance-learning students who must travel in connection with their regular professional work. For classes with large numbers of distance-learning students, these delay times can introduce considerable burdens not otherwise encountered when teaching on-campus students in the regular classroom setting. However, considerable help has been provided by Mrs. Rita Kostoff, the CGEP Administrator at the University of Virginia, to minimize these burdens.

**Question:**

Does teaching to distance-education students located at remote TV Sites preclude or hinder the ability to effectively deliver high-quality mathematics instruction to the on-campus graduate students in the same course?

**Answer:**

For the Engineering Mathematics I and II courses, it is my sense that the quality of the mathematics instruction taught on TV through CGEP is just as high as that of the mathematics instruction taught to on-campus students in the regular classroom setting.

It is the case that CGEP courses are taught in a smaller room, the TV lecture room, than the classrooms available for on-campus courses. Even though the numbers of on-campus students officially enrolling may exceed the limited number of seats available in the smaller room, I do not recall ever having to turn away on-campus students from taking any of my TV courses taught through CGEP because Mrs. Rita Kostoff, the CGEP Administrator at the University of Virginia, kindly makes special efforts to accommodate any such overflows of on-campus students so that they can receive the live lectures simultaneously in an adjacent on-campus TV room.

**Question:**

What are the most memorable positives that you have encountered in your distance-learning teaching through CGEP which would encourage your continuing to teach through CGEP?

**Answer:**

The feedback and comments which I have received from the students in my Engineering Mathematics I and II courses over the years have been deeply gratifying. Many of the most appreciative of these students have been my distance-learning students through CGEP. They have thanked me over and over again for my teaching efforts. These distance-learning students generally are employed full-time, often traveling extensively for their employers, and have family responsibilities as well. Many have emphasized if it were not for these teaching efforts through CGEP that they would not be able otherwise to obtain the mathematics instruction they need. They have indicated that it would be impossible for them to go back to being full-time graduate students because it would require them having to give up their yearly income and support of their families in the process.

**Question:**

Have any of your former CGEP students provided comments which might be viewed as representative of the distance-learning students' perspective?

**Answer:**

The following are comments quoted from one distance-learning student after his completing my Engineering Mathematics II course: APMA 642.

“As a young professional taking graduate engineering classes, I appreciate your teaching APMA 642 Engineering Mathematics II. The course material is very challenging, but the problem-solving techniques learned in this class have a wide variety of applications. For example, APMA 642 teaches solving non-homogenous partial differential equations via Green's functions and Fourier transforms, which are respectively applied by the Electromagnetic Interference group and the Radar shop at my work.”

“Although the course material is difficult, you provide several opportunities for working students to succeed. Lecture notes, homework solutions, and test solutions are available online as study aids. Traveling students can view missed lectures online, as well. Your grading is fair and you are willing to work with students around their schedules. One notable example is when you adjusted the test schedule for a student who was expecting his first child. Also, I have contacted you for help several times during office hours and through email, and you've provided suggestions to help me complete my coursework while on travel. Throughout the semester, you've shown a mastery of the subject matter and a genuine concern for your students.”

“It is difficult to take graduate classes, especially while working at a full-time career. However, because of the resources you provide for this class, working students can focus on learning the material without neglecting the rest of their lives. Committed students will find that taking this class will better prepare them with a stronger background in mathematics, and I believe those who pursue a graduate degree in engineering will find that APMA 642 is worth the effort.”

**Question:**

What should encourage a professor to consider teaching through CGEP?

**Answer:**

Faculty members in the School of Engineering and Applied Science are expected to have a genuine and sustained commitment to excellence in teaching. According to the mission statement of the School of Engineering and Applied Science, we are to be a student-focused school of engineering and applied science educating men and women to be leaders in technology and society and contributing to the well-being of our citizens through the creation and transfer of knowledge. Therefore, should we not reach out through CGEP to dedicated distance-education students with our commitments to excellence in teaching and make possible this mission-pledged transfer of knowledge to help them succeed in their lives and in their professional careers?