Engineering Mathematics Major (EGM)

Mathematics is the art of creating, recognizing, and analyzing abstract quantitative and geometrical structures. Students who pursue this course of study are trained to solve theoretical and practical problems and to communicate their solutions effectively.

The major Engineering Mathematics takes the same general approach to the subject of Mathematics, but with emphasis on mathematical modeling, especially in the domains of physics and statistics. It provides a firm foundation in applied mathematics, especially in calculus-based mathematical modeling for physics, and develops computer programming and data-analysis skills that are needed in contemporary industrial settings.

Engineering Mathematics is the major that is associated with the dual-degree program in Engineering (see below for more information on this program). Nonetheless Engineering Mathematics may be taken by any student, regardless of whether or not the student intends to pursue a degree in Engineering. The major can be a useful component of overall preparation for employment in business and industry, especially when paired with majors such as Economics, Finance, Chemistry, or other natural and social sciences.

The major is **not** recommended as preparation for graduate study in Mathematics. Students who plan to attend graduate school in Mathematics should pursue the Mathematics major.

Accordingly, majors in Engineering Mathematics will:

- **demonstrate knowledge of basic content appropriate to Engineering Mathematics**
- **communicate effectively on quantitative matters;**
- **perform basic mathematical modeling in calculus-based physics and in statistics, interpreting the results in terms of the phenomena being modeled**

The comprehensive exam for Engineering Mathematics takes the form of an extended project in one of the upper-level courses required for the major. Students do not sit for a comprehensive exam separate from their coursework.

ENGINEERING MATHEMATICS MAJOR LEADING TO A BACHELOR OF SCIENCE IN ENGINEERING ARTS

Special arrangements have been made by which an undergraduate student may attend Georgetown College for three years and the University of Kentucky Engineering School for an additional period of study (generally 2.5-3 years) and receive degrees from both institutions. During the time at Georgetown, the student fulfills general education requirements and the required coursework for the major in Engineering Mathematics. After completing Engineering work at the University of Kentucky, the student will be awarded a Bachelor of Arts degree with a major in Engineering Mathematics from Georgetown College and one of the following degrees from the University of Kentucky: Bachelor of Science in Chemical, Civil, Electrical, or Mechanical Engineering.

In all cases, dual-degree students must:

- Have a minimum of ninety-six semester hours credited at Georgetown College.
- Satisfy the Nexus program requirement.
- Satisfy the Georgetown College Foundations and Core requirements.
- Take all courses required to complete a major in Engineering Mathematics.
- Pass the comprehensive exam in Engineering Mathematics.
- Take at Georgetown College the prescribed preparatory courses in mathematics and the sciences that correspond to the type of Engineering degree sought at the University of Kentucky.
- Have the final Georgetown College transcript sent to the University of Kentucky. (This is part of the application process to the University of Kentucky Engineering Program, which effectively treats Georgetown College students as transfer students.)

- Complete the chosen degree at the University of Kentucky.
- Have the final University of Kentucky transcript sent back to the Office of the Registrar at Georgetown College and apply for Georgetown College graduation.

Students matriculating to the University of Kentucky are automatically admitted to pre-engineering but will need to be admitted for engineering standing in an engineering department. The conditions for being admitted to an engineering department vary from department to department and are continually changing. For details, the student should contact an advisor associated with the University of Kentucky engineering program.

Dual degree students may choose one of the following options to participate in a Georgetown College commencement ceremony:

- Participate in the ceremony during the student's final semester at GC.
- Participate in the ceremony during the semester that the student's incoming class graduates.
- Participate in the ceremony during the semester the student completes both UK and GC degrees.

Students must notify the Georgetown College Office of the Registrar of their preferred option two semesters before leaving GC.

Note on Time at University of Kentucky after Transfer

The University of Kentucky advises all prospective transfer students that in most cases 2.5 to three years of study at UK after transfer will be required to complete the Engineering Degree. Completion time depends in part on one's chosen Engineering Track: as a rule, a field outside of the traditional "Big Four" (Chemical, Civil, Mechanical, Electrical) requires more time to complete. Also, students who choose to participate, while at UK, in a paid Engineering co-op experience with a local company, generally need more time to complete.

Prospective students should be aware, therefore, of the likely total time of study. On the other hand, note that for students choosing to attend UK throughout rather than to participate in a transfer program, 4-year completion of the degree is also less common than it used to be.

Note on Academic Preparation

Mathematical and scientific coursework for Engineering is quite rigorous, so students must come to Georgetown well-prepared if they expect to finish the preparatory courses in three years. Students should meet the minimum standards for admission to Georgetown and should also have a strong background in mathematics, sufficient to begin *at least* in Precalculus in their first semester at Georgetown. If at all possible, a student should be prepared to begin in at least Calculus I, which requires a strong precalculus background in high school and which strongly recommends an ACT Math sub-score of 26 or higher, or the equivalent.

DEGREE TYPE: BACHELOR of Arts

PROGRAM CONTACT: PROFESSOR WILLIAM HARRIS

Department: Mathematics
Type: B.A.

Core Courses	26 hours
Required Course Selections	
Allied Courses	3 hours
Allied Courses	6 hours
Total	35

Core Courses

Item #	Title	Credit Hour(s)
MAT125	Calculus I	3
MAT225	Calculus II	3
MAT303	Fundamentals of Data Computing	3
MAT325	Calculus III	3
MAT345	Ordinary Differential Equations	3
PHY211	College Physics I	4
PHY212	College Physics II	4
PHY241	Engineering Physics	3

Required Course Selections

Item #	Title	Credit Hour(s)
	MAT337 or MAT343	
	Additional MAT, PHY, or CSC Course	

Allied Courses

Item #	Title	Credit Hour(s)
CSC115	Computer Science I	3

Allied Courses

Item #	Title	Credit Hour(s)
CSC115	Computer Science I	3
CSC215	Computer Science II	3
	Total credits:	**35**