B.A. in APPLIED SCIENCE AND MATHEMATICS

(32 credits required for graduation with a minimum cumulative GPA of 2.00)

NOTE: This guide is not meant to replace the degree audit; it is subject to change and represents actions approved by Faculty to date. Students are encouraged to run their degree audit at the end of each term of enrollment. Please refer often to the *2017-2018 Online Catalog & Student Handbook http://catalog.berea.edu/en/current/catalog),* which will be updated with the most current information.

GENERAL EDUCATION PROGRAM

No single transfer course can meet more than one General Education requirement.

Core Courses

(Development math courses may be waived on basis of test scores.)
MAT 010 Pre-Algebra
MAT 011 Elementary Algebra
MAT 012 Elementary Algebra II

GSTR 110 Writing Seminar I: Critical Thinking in the Liberal Arts *(Transfer students may waive if College Composition was taken as a degree-seeking student at another college and earned a grade of B or higher.)*
GSTR 210 Writing Seminar II: Identity and Diversity in the U.S.
GSTR 310 Understandings of Christianity
GSTR 410 Seminar-Contemporary Global Issues

Scientific Knowledge and Inquiry

GSTR 332 Scientific Origins **OR**
Two (2) approved science courses, from two different disciplines, one of which must be an approved lab course. The following courses have been approved to meet this requirement: ANR 110, BIO 100, 101, 110, CHM 113, 131, PHY 111, 127, 221

Wellness & Fitness

WELL 101 Principles of Wellness I
WELL 102 Principles of Wellness II
Two (2) ¼-credit HHP activity courses *(HHP 200 will satisfy both the SWIM requirement and one of the activity course requirements)*

Practical Reasoning (PR &PRQ)

Two (2) courses, at least one firmly grounded in math or statistics (PRQ); the other can be an approved practical reasoning (PR) course or another PRQ course.

Perspectives (Six areas required)

One (1) course in **each** of the six areas is required. Individual courses may be approved to satisfy more than one perspective, but no single course may satisfy more than two perspective areas.
1) Arts
2) Social Science
3) Western History
4) Religion
5) African American/Appalachian/Women
6) International (choose one option):
   A) Two (2) courses in the same non-English language, one of which may be waived through testing; **OR**
   B) Two (2) world culture courses, one of which must be grounded in a non-western culture

Active Learning Experience

An approved experience, taken for credit or non-credit (e.g. internships, undergraduate research experiences).

MAJOR COURSES

Core Courses

CHM 131 Accelerated General Chemistry
CSC 226 Software Design & Implementation ***OR***
   CHM 311: Quantitative Analysis
MAT 135 Calculus I
MAT 225 Calculus II
MAT 330 Calculus III
MAT 437 Differential Equations
PHY 221 Intro. Physics I w/Calculus
PHY 222 Intro. Physics II w/Calculus

Required Engineering & Capstone Courses

Two (2) engineering courses completed at an accredited school of engineering and approved by the dual degree advisor. Approved courses will typically include at least one engineering design course and one junior or senior-level course.

Area Distribution Courses

Two (2) additional course credits chosen from one of six (6) focus areas of engineering, at least one (1) at or above the 300-level.

Biosystems and Environmental Engineering
BIO 110 Modern Biology
BIO 310 Ecology
CHM 211 Organic Chemistry I
MAT 312 Operations Research
MAT/CSC 433 Numerical Methods
SENS 320 Intro to Geographical Information Systems
TAD 330 Computer Aided Drafting & Design
TAD 460 Digital Electronics

Chemical and Materials Engineering
CHM 221 Organic Chemistry I
CHM 362 Quantum Chemistry
CHM 451 Advanced Inorganic Chemistry
MAT 312 Operations Research
MAT/CSC 433 Numerical Methods
PHY 130 Applied Math for Physics & Engineering
PHY 320 Modern Physics
PHY 321 Modern Physics II
PHY 365 Thermal Physics
PHY 485 Solid State Physics
TAD 330 Computer Aided Drafting & Design

Civil Engineering
CHM 211 Organic Chemistry I
MAT 214 Linear Algebra
MAT 312 Operations Research
MAT/CSC 433 Numerical Methods
PHY 130 Applied Math for Physics & Engineering
SENS 320 Intro to Geographical Information Systems
TAD 115 Construction Technology
TAD 330 Computer Aided Drafting & Design

Computer Engineering
CSC 236 Data Structures
CSC 335 Computer Organization
CSC 412 Networking
CSC 425 Operating Systems & VMs
CSC 440 Design & Analysis of Algorithms
PHY 320 Modern Physics
TAD 460 Digital Electronics

Electrical Engineering
MAT 214 Linear Algebra
MAT 311 Probability
MAT 312 Operations Research
MAT/CSC 433 Numerical Methods
PHY 130 Applied Math for Physics & Engineering
PHY 320 Modern Physics
PHY 321 Modern Physics II
PHY 460 Electromagnetism
PHY 485 Solid State Physics
TAD 460 Digital Electronics

Mechanical Engineering
MAT 214 Linear Algebra
MAT 312 Operations Research
MAT/SCS 433 Numerical Methods
PHY 130 Applied Math for Physics & Engineering
PHY 365 Thermal Physics
PHY 481 Classical Mechanics
TAD 330 Computer Aided Drafting & Design
TAD 455 Computer Integrated Manufacturing
TAD 460 Digital Electronics

Required Collateral Course (choose one)
TAD 130 Design & Documentation
TAD 245 Materials Processing & Testing
TAD 265 Electricity & Electronics

Admission to the major – Due to the minimum GPA requirements of engineering programs (2.5 at the University of Kentucky School of Engineering), the applicant should waive or complete MAT 135 and 225, as well as complete CHM 131 and PHY 221, with a combined GPA of at least 2.5 for these four courses.

Other considerations and recommendations – Students should be aware that the minimum GPA for admission to the engineering school is higher than the 2.0 minimum required at Berea. In addition, students must earn a minimum grade of C or better in CHM 211 to be accepted into the University of Kentucky Chemical Engineering program.

Because of language requirements at many engineering schools, including the University of Kentucky, students who intend to complete the dual degree program are strongly encouraged to satisfy Berea's International Perspective requirement by completing two courses in the same foreign language. In order to fulfill the University of Kentucky's composition and communication requirement, students must take COM 203 in addition to successfully completing GSTR 110 and 210. Alternatively, students may elect to take a communications course once enrolled at UK.