



The University of Georgia

University Council
Athens, Georgia 30602

March 13, 2015

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Dear Colleagues:

The attached proposal to offer new dual degrees in the following majors in Engineering and German (A.B.) will be an agenda item for the March 20, 2015, Full University Curriculum Committee meeting:

Agricultural Engineering (B.S.A.E.) and German (A.B.)

Biological Engineering (B.S.B.E.) and German (A.B.)

Civil Engineering (B.S.C.E.) and German (A.B.)

Computer Systems Engineering (B.S.C.S.E.) and German (A.B.)

Electrical and Electronics Engineering (B.S.E.E.) and German (A.B.)

Mechanical Engineering (B.S.M.E.) and German (A.B.)

Sincerely,

William K. Vencill, Chair

University Curriculum Committee

cc: Provost Pamela S. Whitten
Dr. Rahul Shrivastav

**The University of Georgia
Dual Degree Program Proposal**

1. **Institution:** University of Georgia
2. **Date:** December 9th, 2014
3. **Colleges:** College of Engineering, Franklin College of Arts and Sciences
4. **Departments:**
 - College of Engineering
 - Department of Germanic and Slavic Studies in the Franklin College of Arts and Sciences
5. **Degrees:**
 - Bachelor of Science in Agricultural Engineering (B.S.A.E.)
 - Bachelor of Science in Biological Engineering (B.S.B.E.)
 - Bachelor of Science in Civil Engineering (B.S.C.E.)
 - Bachelor of Science in Computer Systems Engineering (B.S.C.S.E.)
 - Bachelor of Science in Electrical and Electronics Engineering (B.S.E.E.)
 - Bachelor of Science in Mechanical Engineering (B.S.M.E.)
 - Bachelor of Arts (A.B.)
6. **Majors:**
 - Agricultural Engineering (B.S.A.E.) and German (A.B.)
 - Biological Engineering (B.S.B.E.) and German (A.B.)
 - Civil Engineering (B.S.C.E.) and German (A.B.)
 - Computer Systems Engineering (B.S.C.S.E.) and German (A.B.)
 - Electrical and Electronics Engineering (B.S.E.E.) and German (A.B.)
 - Mechanical Engineering (B.S.M.E.) and German (A.B.)
7. **Starting Date:** Fall Semester 2015
8. **Program Abstract:** This proposal seeks approval to combine into one course of study six of the eight B.S. engineering degrees with the A.B. degree in German. The proposed program consists of a five-year course of study resulting in a dual degree in one of six engineering fields and German. The program is designed to include traditional German language courses as well as a specialized German course for engineering students and a one-year stay abroad in the fourth year, during which students will complete one semester of study at a German technical university (Karlsruhe Institute of Technology) and a six-month internship with a German company abroad. Graduates of the program will possess not only engineering expertise, but also valuable international experience and a track record of meaningful intercultural interaction. As such, they will be uniquely qualified to succeed in their chosen careers whether here in the U.S. or abroad.

9. **Objectives of the Program:** The primary objective of this dual degree program is to enhance the professional education of engineering students with intercultural competence and advanced proficiency in German. It seeks to combine technical and practical aspects of the scientific field of engineering with the cultural and linguistic competency and study abroad aspects of German studies in order to create something greater than the sum of its parts, both in terms of the student experience and in the career opportunities available to students upon graduation. Beyond offering students the opportunity to gain advanced linguistic proficiency and the experience of study and work abroad, the program aims to provide them with the competence to understand and negotiate intercultural environments in today's global economy. This includes the ability to critically reflect on German and American norms, values, and cultural practices as well as an understanding of the historical and cultural construction of identity, both national and personal. We are convinced that the combination of a comprehensive and demanding engineering education with a deep knowledge and understanding of intercultural relations will make for well-educated, highly employable individuals who possess excellent job and foreign language skills as well as the ability to operate successfully in international, multicultural work settings.

10. **Justification and Need for the Program**

a. **Benefits:**

- i. **Benefits to Students:** Of the total number of UGA students who studied abroad during the academic year 2011-2012—the year for which we have the most recent data—only .2% (i.e., 4 students) came from the College of Engineering (http://international.uga.edu/education_abroad). This is even lower than national data from the same year, which revealed that a mere 3.9% of U.S. engineering students had participated in a study abroad program (<http://www.iese.org/>). The rigorous course of study common to engineering—which requires students to take a large number of courses, often sequenced over several semesters—makes it challenging for students to develop an interest in areas outside of their major, leaving many with the impression that they do not have time to study abroad, or even that a foreign language would not be relevant to their future career. Of course, the latter could not be any more untrue. Engineers with foreign language skills and international experience are in high demand, as companies operate globally or seek to nurture new markets in the foreign sphere. Moreover, the engineering graduate who possesses not only proficiency in a foreign language, but also the cultural soft skills necessary to function effectively in an international setting, is a true stand-out in today's job market. For students who wish to work in the state of Georgia, experience with German is especially advantageous. Georgia possesses extensive economic relations with Germany, which is one of its top five trading partners. German companies located in the state, of which there are over 450 (including 80 German engineering-related firms), currently employ more than 21,000 Georgians, and Georgia exports to Germany exceed one billion dollars (all statistics from the Georgia Department of Economic Development and valid as of February 2014; www.georgiafacts.org).
- ii. **Benefits to the College of Engineering:** Engineering firms increasingly need graduates who are not only proficient in the technical aspects of engineering, but who are also good communicators and understand cross-cultural perspectives. The expected benefits of this dual degree program to the College of Engineering are as follows: (1) the program will facilitate the recruitment of engineering students who are more academically well rounded and who possess interests and experience beyond that of the traditional engineering student; (2) we expect that it may increase the number of female engineering students enrolled in the college; (3) relationships with technical universities in Germany will lead to faculty exchanges and joint

research programs; and (4) the program will encourage the development of internship, research, and outreach relationships with the more than 80 German engineering firms that have offices in Georgia. The global marketplace favors graduates who can bring an international perspective to their employers and to the work that they do, and as such, the College of Engineering aims to prepare students for meaningful participation in the global economy. The proposed dual degree program will enhance the college's reputation and standing, as it can be used to help recruit top students from not only within Georgia, but also from around the country.

- iii. Benefits to the Department of Germanic and Slavic Studies:** Each semester, between 500 and 550 students enroll in a German course at UGA—a number which reflects the good standing and sound health of the program. Currently, the department counts close to 60 German majors, and in 2012 saw the highest overall enrollment in the program's history. A 2013 program review praised the department's "dynamic atmosphere," its "dedication to high quality teaching," the superior quality of student advising and mentoring in the unit, and the "quite impressive" research productivity of its faculty. Building on this strong foundation, the department continues to look for opportunities to grow and excel. We see the benefit to our program as four-fold: (1) Program growth through higher enrollment numbers would stand to benefit not only students in the proposed dual degree program, but all students in the department via increased hiring opportunities that would enable us to offer more sections of introductory courses as well as a wider variety of content courses at the advanced level; (2) Greater diversity of our student body (i.e., through the inclusion of more students with a background in math and science) would enrich the intellectual life of the department for both faculty and students; (3) The establishment of a strong connection to a German university would enable not only student exchanges between our campuses, but also help promote faculty exchanges and valuable research collaborations; and (4) The integration of content from so-called STEM (science, technology, engineering, and mathematics) fields with foreign language courses is currently an oft-discussed topic in foreign language education, and we wish to remain active in this conversation. Perusal of the program for the most recent annual conference of the American Council on the Teaching of Foreign Languages is evidence of the relevance of STEM fields for foreign language teaching at the post-secondary level.
- b. **Student Demand:** We anticipate that student demand for this program will average to between 10 and 15 new dual degree students per year. Already at this point, 10 students currently intend to complete the proposed dual-degree course of study as a double major. These students are all enrolled in a German course alongside their engineering curriculum, with most of them in their second or third semester of German language instruction. It is a cohort that has been steadily growing since recruitment began during the fall 2013 semester, and is expected to continue to grow, especially as advisors in the College of Engineering raise awareness of the program among incoming freshmen and once we can offer and advertise the program of study as an official dual degree. The state of Georgia boasts an extensive network of high school German programs—currently teaching German to well over 13,000 students. Once a dual degree program is in place, we plan to launch a concerted recruitment effort in order to reach out to those among them who are interested in a career in engineering, so that they become aware of the opportunity that would await them should they choose to study at UGA. The timing of such a recruitment effort could not be any better given the current trend of growth in the College of Engineering, where student enrollment has increased over five-fold in the past decade and is now

reaching numbers that are poised to make a significant impact within the Georgia economy and beyond. The anticipated demand for this program would represent only approximately 4% of the engineering students at UGA, given the current size of the college.

- c. **Additional Justification:** The concept of a program that combines the study of engineering and German is not unique to this proposed program, and such programs have already seen success at a number of institutions in the United States, including—but not limited to—the University of Michigan, the University of Connecticut, Purdue University, and the University of Rhode Island. The University of Rhode Island’s program is the most established of its kind, having graduated approximately 250 students since the program’s inception in 1987 (<http://web.uri.edu/iep/>). Rhode Island’s engineering dual degree offerings, which began with German, have since grown to include Chinese, French, Italian, and Spanish, and the International Engineering Program, as it is called, has made the University of Rhode Island a premier destination for aspiring engineers, particularly those with a curiosity about and openness toward other cultures.

11. **Program Development:** This program has been in development since 2012, when Drs. David Stooksbury (Engineering) and Martin Kagel (Germanic and Slavic Studies) began to discuss the possibility of establishing a dual degree program between their respective colleges. Together they completed an outline for an undergraduate course of study in engineering and German and presented this outline to their college deans, who expressed support for continued development of the program. At the end of the spring 2013 semester, the Department of Germanic and Slavic Studies received approval from the dean’s office to hire a lecturer whose task it would be to develop and facilitate the program. This lecturer, Dr. Katie Chapman, has been in the Department of Germanic and Slavic Studies since the fall 2013 semester. Program development, including student recruitment, began in earnest during the 2013-2014 academic year. Early in the fall term 2013, faculty from both units met to discuss the future of the program. The result was the creation of a committee to shepherd the development and planning for this program. That committee consists of Drs. David Stooksbury and Tom Lawrence (Engineering) and Drs. Katie Chapman and Martin Kagel (Germanic and Slavic Studies). Dr. Lawrence has a history of interaction with the engineering programs and faculty at Karlsruhe Institute of Technology (KIT) via the mechanical engineering exchange program between KIT and Purdue University, where he completed his doctoral work. He has facilitated the development of an exchange agreement between UGA and KIT, which was signed by deans in Franklin and Engineering and approved by the UGA Office of International Education in the summer of 2014, and is currently at the final signatory stage. Dr. Lawrence has visited Karlsruhe four times during the past year and half and has met with a number of engineering department heads as well as the KIT Office of International Education. During those visits, he has established the key contacts that are needed for success of this program. In addition, Dr. Lawrence has experience in developing international internships for students, both while at Purdue University as well as through his industry experience.

12. **Curriculum**

- a. Proposed programs of study for the following dual degree programs: See Attachment I
 - Agricultural Engineering (B.S.A.E.) and German (A.B.)
 - Biological Engineering (B.S.B.E.) and German (A.B.)
 - Civil Engineering (B.S.C.E.) and German (A.B.)
 - Computer Systems Engineering (B.S.C.S.E.) and German (A.B.)

- Electrical and Electronics Engineering (B.S.E.E.) and German (A.B.)
- Mechanical Engineering (B.S.M.E.) and German (A.B.)

- b. Current programs of study for the following majors in Engineering: See Attachment II
- Agricultural Engineering (B.S.A.E.)
 - Biological Engineering (B.S.B.E.)
 - Civil Engineering (B.S.C.E.)
 - Computer Systems Engineering (B.S.C.S.E.)
 - Electrical and Electronics Engineering (B.S.E.E.)
 - Mechanical Engineering (B.S.M.E.)
- c. Current program of study for the major in German (A.B.): See Attachment III

13. **Program Administration:** A student will declare his or her intention to earn the dual degree as soon as possible, ideally during summer registration prior to freshman year. Initial advising will take place in the College of Engineering. The proposed dual degree curriculum (see Attachment I) assumes a student who enters UGA without any AP or transfer credit and with no background in German. Thus, the program can be completed in five years even if a student's first exposure to German is during the fall semester of their first freshman year. Depending on the engineering major chosen, a requirement for some summer course work of no more than six credit hours may be required. Additionally, several options are in place for students who would like to move more quickly through the German language sequence: GRMN 2001 is offered in an online format each summer, and a June UGA study abroad program in Freiburg, Germany, can be used to satisfy a German language course at any level. Until the student has completed 60 credit hours, he or she will be advised in the College of Engineering and in Franklin College. After that time, the student will also meet with a faculty advisor in Germanic and Slavic Studies who will aid in selecting upper-division German courses to complete the major. Students will also continue to be advised within the College of Engineering for their engineering degree-related coursework. At the end of the program, students will complete graduation checks in both the College of Engineering and in Franklin College.

Program Contacts: Dr. Thomas Lawrence (College of Engineering) lawrence@engr.uga.edu
 Dr. Katie Chapman (Department of Germanic and Slavic Studies) katieec@uga.edu

14. **Assessment:** Participants in the dual degree program must meet the standard minimum criteria for their majors in both colleges (see a and b, below). Additional measures (see c, below) will be added to the college's and department's existing assessment processes and will focus on the unique combination of technical expertise, linguistic proficiency, and intercultural understanding that the program is designed to develop.

a. **Assessment in the College of Engineering:** All degree programs in the College of Engineering are structured to meet the requirements of the Accreditation Board for Engineering and Technology (ABET). Meeting ABET requirements is necessary for a student to eventually become eligible for licensure as a registered Professional Engineer. The programs of study shown in Attachment I meet the requirements of the College of Engineering and the ABET. A key part of the ABET process is assessment of the programs. The College of Engineering and the ABET both follow an established process for evaluation and assessment of their programs.

- b. **Assessment in the Department of Germanic and Slavic Studies:** Students who participate in the dual degree program, like all other students who major in German, will be required to earn a grade of C or higher in any course they wish to apply toward their German major. Furthermore, in order to be considered eligible for the year of study and work abroad (designed to be students' fourth year of study), they must demonstrate their readiness by successful completion of the fifth-semester German language course for engineers (GRMN 3010E). Prior to graduation from the Department of Germanic and Slavic Studies, students will also complete a Simulated Oral Proficiency Interview in order to assess their attained proficiency in spoken German according to guidelines set by the American Council on the Teaching of Foreign Languages. The results of this interview will build part of the student's assessment portfolio, which includes samples of written work from upper-division courses, the results of a simulated citizenship exam taken in the fifth semester of instruction, as well as an exit questionnaire. Together, the components of the portfolio are designed to provide as comprehensive a picture as possible of the student's experience and success in the program.
- c. **Assessment Unique to the Dual Degree:** An additional measure planned for this program at the level of student assessment is an exit interview that places special emphasis on ABET Criterion 3, which is designed to assess: the student's ability to function in multidisciplinary teams; their understanding of professional and ethical responsibility; their ability to communicate effectively; their understanding of the impact of engineering solutions in global, economic, environmental, and societal contexts; their ability and recognition of the need to engage in lifelong learning; and their knowledge of contemporary issues in the field. To assess our own success in developing and administering the dual degree program, we plan to use five measures: (1) job placement statistics that compare dual degree students to those who did not participate in the dual degree program; (2) statistics showing dual degree students' scores on the Fundamentals of Engineering (FE) Exam and how they compare to those of students who did not participate in the dual degree program; (3) longitudinal enrollment numbers in the dual degree program, as well as in the College of Engineering and in the Department of Germanic Studies; (4) statistics on the demographic makeup and academic qualifications of students who enroll in the dual degree program as compared to those engineering students who do not; and (5) interviews with internships sponsors.

15. **Fiscal and Enrollment Impact and Estimated Budget:**

No additional fiscal impact as a result of this dual degree program is anticipated. Additional faculty or staff resources will not be necessary, as all academic courses identified in the curriculum for the proposed program are currently being offered (with the exception of GRMN 3010E, the development of which Dr. Katie Chapman is already charged as an inherent part of her position). There will be no significant impact on enrollment as a result of this program.

Programs of Study
for Dual Degrees

BSAE Agricultural Engineering & AB German

Year One			
Fall Semester		Spring Semester	
ENGR 1120 Eng. Graphics & Design	3	ENGR 1140 Computational Methods	2
ENGR 2100 Principles of Systems Engineering	3	MATH 2260 Calculus II Science & Eng.	4
MATH 2250 Calculus I for Science & Engineering	4	PHYS 1251 Physics for Engineers I	3
GRMN 1001 Elementary German I ¹	4	GRMN 1002 Elementary German II	4
FYOS 1001 First Year Odyssey Seminar	1	GRMN 2300 or LING 2100 ²	3
Total Credit Hours	15	Total Credit Hours	16
Summer (Year One – Year Two)			
ENGL 1101 English Composition I	3		
POLS 1101 American Government	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
ENGR 2120 Statics	3	CHEM 1211&L General Chemistry	4
MATH 2500 Multivariable Calculus	3	ENGR 2130 Dynamics	3
PHYS 1252 Physics for Engineers II	3	ENVE 3510 Modeling, Stat. Analysis & Uncertainty	3
ENGR 2110 Engineering Decision Making	3	MATH 2700 Differential Equations	3
GRMN 2001 Intermediate German I	3	GRMN 2002 Intermediate German II	3
Total Credit Hours	15	Total Credit Hours	16
Summer (Year Two – Year Three)			
ENGL 1102 English Composition II	3		
Total Credit Hours	3		
Year Three			
Fall Semester		Spring Semester	
ENGR 2140 Strength of Materials	3	ENGR 2170 Electrical Circuits	3
ENGR 3160 Fluid Mechanics	3	ENGR 3150 Heat Transfer	3
MCHE 3140 Engineering Thermodynamics I	3	BIOL 1108 & L Biology II	4
BIOL 1107 & L Biology I	4	GRMN 3/4XXX Film or Literature	3
GRMN 3010E German for Engineering	3	GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	16	Total Credit Hours	16
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Agricultural Engineering Track Elective	3		
Agricultural Engineering Track Elective	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours (does not count)	NA³
Year Five			
Fall Semester		Spring Semester	
Agricultural Engineering Track Elective	3	ENGR 4920 Engineering Design Project	4
Agricultural Engineering Track Elective	3	Agricultural Engineering Track Elective	3
ENGR 4XXX Agricultural & Natural Res. Systems	3	Agricultural Engineering Track Elective	3
GRMN 3/4XXX Film or Literature	3	GRMN 4520 Senior Seminar	3
HIST 2111 or HIST 2112	3	Area V Franklin College Social Science/Multicultural ⁴	3
Total Credit Hours	15	Total Credit Hours	16

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).
- 3 Credits neither count against HOPE nor are credited toward degree requirements.
- 4 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.

BSBE Biological Engineering & AB German

Year One			
Fall Semester		Spring Semester	
ENGR 1120 Eng. Graphics & Design	3	CHEM 1212 & L Chemistry II	4
CHEM 1211 & L Chemistry I	4	MATH 2260 Calculus II Science & Eng.	4
MATH 2250 Calculus I for Science & Eng.	4	PHYS 1251 Physics for Engineers I	3
GRMN 1001 Elementary German I ¹	4	GRMN 1002 Elementary German II	4
FYOS 1001 First Year Odyssey Seminar	1		
Total Credit Hours	16	Total Credit Hours	15
Summer (Year One – Year Two)			
ENGL 1101 English Composition I	3		
COMM 1100 Introduction to Public Speaking	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
CHEM 1211&L Organic Chemistry I	4	BIOL 1104 & L Organismal Biology	4
BIOL 1103 & L Basic Concepts of Biology	4	BCMB 3100 Introduction to Biochemistry	4
MATH 2500 Multivariable Calculus	3	ENGR 2120 Statics	3
PHYS 1252 Physics for Engineers II	3	GRMN 2002 Intermediate German II	3
GRMN 2001 Intermediate German I	3	Area V Franklin College Social Science/Multicultural ²	3
Total Credit Hours	17	Total Credit Hours	17
Summer (Year Two – Year Three)			
ENGL 1102 English Composition II	3		
MATH 2700 Differential Equations	3		
Total Credit Hours	6		
Year Three			
Fall Semester		Spring Semester	
ENGR 3150 Heat Transfer	3	ENGR 2140 Strength of Materials	3
ENGR 2170 Electrical Circuits	3	MCHE 3140 Engineering Thermodynamics I	3
ENGR 2110 Engineering Decision Making	3	ENGR 3150 Heat Transfer	3
ENGR 3160 Fluid Mechanics	3	ENGR 3520 Mass Transport and Rate Phenomena	3
MBIO 3500 Introduction to Microbiology	3	GRMN 3/4XXX Film or Literature	3
GRMN 3010E German for Engineering	3	GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	20	Total Credit Hours	18
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Biological Engineering Elective	3		
Science Elective ³	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours	NA⁴

(Year Five on following page →)

Year Five			
Fall Semester		Spring Semester	
Biological Engineering Elective	3	ENGR 4920 Engineering Design Project	4
Biological Engineering Elective	3	Biological Engineering Elective	3
ENGR 2920 Engineering Design Methods	2	Biological Engineering Elective	3
GRMN 3/4XXX Film or Literature	3	GRMN 4520 Senior Seminar	3
POLS 1101 American Government	3	GRMN 2300 or LING 2100 ⁵	3
HIST 2111 or HIST 2112	3		
Total Credit Hours	17	Total Credit Hours	16

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.
- 3 Science Elective: Suggested courses include BCMB (CHEM) 4110; BCMB (ENTO) 4200; CBIO (BIOL) 3400; CBIO (MBIO) 4100; CRSS 4600 & L; ECOL (BIOL) 3500-3500L; MIBO 4090; VPHY 3100
- 4 Credits neither count against HOPE nor are credited toward degree requirements.
- 5 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).

BSCE Civil Engineering & AB German

Year One			
Fall Semester		Spring Semester	
ENGR 1120 Eng. Graphics & Design	2	MATH 2260 Calculus II Science & Eng.	4
ENGR 1140 Computational Eng. Methods	2	PHYS 1251 Physics for Engineers I	3
ENGR 1920 Introduction to Engineering	1	ENGR 2110 Engineering Decision Making	3
MATH 2250 Calculus I for Science & Eng.	4	Life Science Elective ²	4
GRMN 1001 Elementary German I ¹	4	GRMN 1002 Elementary German II	3
FYOS 1001 First Year Odyssey Seminar	1		
ENGL 1101 English Composition I	3		
Total Credit Hours	17	Total Credit Hours	17
Summer (Year One – Year Two)			
COMM 1100 Introduction to Public Speaking	3		
POLS 1101 American Government	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
ENGR 2120 Statics	3	ENGR 2140 Strength of Materials	3
MATH 2500 Multivariable Calculus	3	ENGR 3160 Fluid Mechanics	3
PHYS 1252 Physics for Engineers II	3	MCHE 3140 Eng. Thermodynamics	3
CHEM 1211&L General Chemistry	4	CVLE 2210 Principles of Surveying and Transport.	2
GRMN 2001 Intermediate German I	3	GRMN 2002 Intermediate German II	3
		Area V Franklin College Social Science/Multicultural ³	3
Total Credit Hours	16	Total Credit Hours	17
Summer (Year Two – Year Three)			
MATH 2700 Differential Equations	3		
ENGL 1102 English Composition II	3		
Total Credit Hours	6		
Year Three			
Fall Semester		Spring Semester	
ENGR 2130 Dynamics	3	ENGR 3420 Soil Mechanics	3
ENGR 3150 Heat Transfer	3	CVLE 2710 Numerical Methods for Engineers	2
ENGR 3410 Intro to Natural Resource Engineering	3	CVLE 3310 Civil Engineering Materials	3
ENGR 3610 Structural Design	3	CVLE 3730 Engineering Project Management	2
CVLE 3460 Civil Engineering Lab- Hydraulics	1	CVLE 3450 Civil Engineering Lab- Soils	1
CVLE 3470 Civil Engineering Lab- Structural	1	GRMN 3/4XXX Film or Literature	3
GRMN 3010E German for Engineering	3	GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	17	Total Credit Hours	17
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Civil Engineering Track Elective	3		
Civil Engineering Track Elective	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours (does not count)	NA⁴

(Year Five on following page →)

Year Five			
Fall Semester		Spring Semester	
CVLE 4910 Capstone Design I	2	CVLE 4920 Capstone Design II	2
ENGR 4660 Sustainable Building Design	3	Civil Engineering Track Elective	3
Civil Engineering Track Elective	3	Civil Engineering Track Elective	3
Civil Engineering Track Elective	3	Civil Engineering Track Elective	3
GRMN 3/4XXX Film or Literature	3	GRMN 4520 Senior Seminar	3
HIST 2111 or HIST 2112	3	GRMN 2300 or LING 2100 ⁵	3
Total Credit Hours	17	Total Credit Hours	17

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 BIOL 1104 or ECOL 1000 with its lab are the courses preferred by Civil Engineering that ALSO satisfy Franklin College biological science requirements.
- 3 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.
- 4 Credits neither count against HOPE nor are credited toward degree requirements.
- 5 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).

BSCSEE Computer Systems Engineering & AB German

Year One			
Fall Semester		Spring Semester	
MATH 2250 Calculus I for Science & Eng.	4	MATH 2260 Calculus II Science & Eng.	4
CSCI 1301 Intro to Computing and Programming	4	CSCI 2611 Discrete Math for Engineers	3
CSEE 2200 Intro to Computer Systems Eng. I	2	CSEE 2210 Intro to Computer Systems Eng. II	3
GRMN 1001 Elementary German I ¹	4	PHYS 1251 Physics for Engineers I	3
FYOS 1001 First Year Odyssey Seminar	1	GRMN 1002 Elementary German II	4
Total Credit Hours	15	Total Credit Hours	17
Summer (Year One – Year Two)			
ENGL 1101 English Composition I	3		
POLS 1101 American Government	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
CSEE 2220 Logic Design	3	Computer Systems Engineering Sophomore Design	4
MATH 2500 Multivariable Calculus	3	ENGR 2170 Electrical Circuits	3
CSCI 1730 Systems Programming	4	CSCI 2720 Data Structures	4
CSCI 1302 Software Development	4	GRMN 2002 Intermediate German II	3
GRMN 2001 Intermediate German I	3	Area V Franklin College Social Science/Multicultural ²	3
Total Credit Hours	17	Total Credit Hours	17
Summer (Year Two – Year Three)			
ENGL 1102 English Composition II	3		
MATH 2700 Differential Equations	3		
Total Credit Hours	6		
Year Three			
Fall Semester		Spring Semester	
ENGR 2720 Electronics I	3	ENGR 2110 Engineering Decision Making	3
ENGR 4230 Sensors & Transducers	3	MATH 3300 Applied Linear Algebra	3
CSEE 4230 Embedded Systems	3	Computer Systems Engineering Elective	3
GRMN 3010E German for Engineering	3	GRMN 3/4XXX Film or Literature	3
HIST 2111 or HIST 2112	3	GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	15	Total Credit Hours	15
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Computer Systems Engineering Elective	3		
Computer Systems Engineering Elective	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours (does not count)	NA³
Year Five			
Fall Semester		Spring Semester	
ENGR 4210 Linear Systems	3	CSEE 4920 Capstone Design	4
CSEE 4270 Design of Digital Systems	4	CSEE 4280 Advanced Digital Design	4
Computer Systems Engineering Elective	3	ENGG 2090 Probability & Statistics for Engineers	3
BIOL 1103 Biology I	3	GRMN 4520 Senior Seminar	3
GRMN 3/4XXX Film or Literature	3	GRMN 2300 or LING 2100 ⁴	3
Total Credit Hours	16	Total Credit Hours	17

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.
- 3 Credits neither count against HOPE nor are credited toward degree requirements.
- 4 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).

BSEE Electrical Engineering & AB German

Year One			
Fall Semester		Spring Semester	
ELEE 1030 Intro to Electrical Engineering	3	MATH 2260 Calculus II Science & Eng.	4
MATH 2250 Calculus I for Science & Eng.	4	CSEE 2220 Logic Design	3
GRMN 1001 Elementary German I ¹	4	PHYS 1251 Physics for Engineers I	3
FYOS 1001 First Year Odyssey Seminar	1	GRMN 1002 Elementary German II	4
ENGL 1101 English Composition I	3	GRMN 2300 or LING 2100 ²	3
Total Credit Hours	15	Total Credit Hours	17
Summer (Year One – Year Two)			
ENGL 1102 English Composition II	3		
MATH 2500 Multivariable Calculus	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
ELEE 2040 Programming for Electrical Eng.	3	ENGR 2110 Engineering Decision Making	3
ENGG 2090 Probability & Statistics for Engineers	3	ENGR 2170 Electrical Circuits	3
PHYS 1252 Physics for Engineers II	3	MCHE 3140 Eng. Thermodynamics	3
CHEM 1211&L General Chemistry	4	Engineering Science Elective ³	3
GRMN 2001 Intermediate German I	3	GRMN 2002 Intermediate German II	3
Total Credit Hours	16	Total Credit Hours	15
Summer (Year Two – Year Three)			
POLI 1101 American Government	3		
MATH 2700 Differential Equations	3		
Total Credit Hours	6		
Year Three			
Fall Semester		Spring Semester	
ELEE 4020 Electromagnetics	3	ELEE 3020 Electrical Engineering Design Lab	2
ENGR 3270 Electronics I	3	ELEE 4710 Fundamentals of Power	3
ENGR 4210 Linear Systems	3	ENGR 4220 Feedback Control	3
GRMN 3/4XXX Film or Literature	3	ENGR 4240 Microcontrollers	3
GRMN 3010E German for Engineering	3	ENGR 4270 Electronics II	3
		GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	15	Total Credit Hours	17
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Electrical Engineering Track Elective	3		
Electrical Engineering Track Elective	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours (does not count)	NA⁴
Year Five			
Fall Semester		Spring Semester	
ELEE 4910 Capstone Design I	2	ELEE 4920 Capstone Design II	2
Electrical Engineering Track Elective	3	Electrical Engineering Track Elective	3
Electrical Engineering Track Elective	3	Electrical Engineering Track Elective	3
BIOL 1104 Organismal Biology	3	CSEE 4210 Digital Signal Processing	3
GRMN 3/4XXX Film or Literature	3	GRMN 4520 Senior Seminar	3
HIST 2111 or HIST 2112	3	Area V Franklin College Social Science/Multicultural ⁵	3
Total Credit Hours	17	Total Credit Hours	17

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).
- 3 Engineering Science Elective: Select from ENGR 2120 or ENGR 3150
- 4 Credits neither count against HOPE nor are credited toward degree requirements.
- 5 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.

BSME Mechanical Engineering & AB German

Year One			
Fall Semester		Spring Semester	
ENGR 1120 Eng. Graphics & Design	2	MCHE 1940 Mechanical Eng. Design Studio	3
ENGR 1140 Computational Eng. Methods	2	MATH 2260 Calculus II Science & Eng.	4
ENGR 1920 Introduction to Engineering	1	PHYS 1251 Physics for Engineers I	3
MATH 2250 Calculus I for Science & Eng.	4	GRMN 1002 Elementary German II	4
GRMN 1001 Elementary German I ¹	4	GRMN 2300 or LING 2100 ²	3
FYOS 1001 First Year Odyssey Seminar	1		
ENGL 1101 English Composition I	3		
Total Credit Hours	17	Total Credit Hours	17
Summer (Year One – Year Two)			
ENGL 1102 English Composition II	3		
POLS 1101 American Government	3		
Total Credit Hours	6		
Year Two			
Fall Semester		Spring Semester	
ENGR 2120 Statics	3	ENGR 2140 Strength of Materials	3
MATH 2500 Multivariable Calculus	3	ENGR 3160 Fluid Mechanics	3
PHYS 1252 Physics for Engineers II	3	MCHE 3140 Eng. Thermodynamics	3
CHEM 1211&L General Chemistry	4	GRMN 2002 Intermediate German II	3
GRMN 2001 Intermediate German I	3	Area V Franklin College Social Science/Multicultural ³	3
Total Credit Hours	16	Total Credit Hours	15
Summer (Year Two – Year Three)			
MATH 2700 Differential Equations	3		
Total Credit Hours	3		
Year Three			
Fall Semester		Spring Semester	
ENGR 3150 Heat Transfer	3	ENGR 2130 Dynamics	3
ENGR 2170 Electrical Circuits	3	MCHE 3310 Mechanical Engineering Materials	3
ENGR 3300 Mechanisms & Kinematics	3	MCHE 3920 Manufacturing & Design Studio	3
MCHE 2990 Eng. Systems in Society	3	MCHE 3450 Mechanical Engineering Lab	2
MCHE 4000 Eng. Professional Practice II	1	GRMN 3/4XXX Film or Literature	3
GRMN 3010E German for Engineering	3	GRMN 3020 Language: Culture & Society II	3
Total Credit Hours	16	Total Credit Hours	17
Year Four (in Germany)			
Fall Semester (German University; Oct-Feb)		Spring Semester (Internship; Mar-Jul)	
Intensive German (before German semester begins)	3	ENGR 3900 Cooperative Work Experience	12
Mechanical Engineering Track Elective	3		
Mechanical Engineering Track Elective	3		
German Elective	3		
German Elective	3		
Total Credit Hours	15	Total Credit Hours (does not count)	NA⁴

(Year Five on following page →)

Year Five			
Fall Semester		Spring Semester	
MCHE 4910 Capstone Design I	2	MCHE 4920 Capstone Design II	2
ENGR 4210 Linear Systems	3	ENGR 4220 Feedback Control Systems	3
ME Track Elective	3	ME Track Elective	3
MCHE 4390 Mechanical Vibration or Biology ⁵	3	ENGR 4300 Mechanical Systems or Biology ⁵	3
MCHE 3410 Numerical Methods in ME	3	GRMN 4520 Senior Seminar	3
GRMN 3/4XXX Film or Literature	3	HIST 2111 or HIST 2112	3
Total Credit Hours	17	Total Credit Hours	17

- 1 If GRMN 1002, 2001, and/or 2002 are satisfied by departmental placement test credit, other Area IV WLC courses will need to be substituted, since placement test credit can't satisfy Area IV.
- 2 Either can satisfy the second Franklin College fine arts/philosophy/religion requirement (the other fine arts/philosophy/religion requirement will be satisfied by the GRMN 3/4XXX Film course).
- 3 Choose one from: AFAM 2000; GEOG 1103; WMST 1110; SOCI 2020; SOCI 2820. These are the only Area V options that satisfy BOTH Franklin College social science AND Franklin College multicultural requirements.
- 4 Credits neither count against HOPE nor are credited toward degree requirements.
- 5 Either MCHE 4390 in Fall or ENGR 4300 in Spring, with the other term taking BIOL 1103, 1104 or 1107.

Current Programs of Study

BSAE AGRICULTURAL ENGINEERING
Fall 2013

Year One**Fall Semester**

Course	Credit Hours
ENGR 1120 Engineering Graphics	3
ENGR 2100 Principles of Systems Engr	3
MATH 2250 Calculus I Sci Engr	4
CHEM 1211 & L Chemistry I	4
ENGL 1101 English Comp I	3

Spring Semester

Course	Credit Hours
ENGR 1140 Comp Methods	2
ENGR 2110 Engr Decision Making	3
MATH 2260 Calculus II Sci Engr	4
PHYS 1251 Physics for Engineers I	3
ENGL 1102 English Comp. II	3
FYOS 1001 First-Year Odyssey	1

Total Credit Hours **17**

16

Year Two**Fall Semester**

Course	Credit Hours
ENGR 2120 Statics	3
MATH 2500 Multivariable Calculus	3
PHYS 1252 Physics for Engineers II	3
BIOL 1107 & L Biology I	4
MAJOR RELATED ELECTIVE*	3

Spring Semester

Course	Credit Hours
ENGR 2170 Electrical Circuits	3
ENGR 2920 Engr Design Meth	2
ENVE 3510 Modeling, Stat Analysis	3
MATH 2700 Differential Equations	3
POLS 1101 American Government	3
Social Science Elective	3

Total Credit Hours **16**

17

Year Three**Fall Semester**

Course	Credit Hours
ENGR 3150 Heat Transfer	3
ENGR 3160 Fluid Mechanics	3
MCHE 3140 Engr Thermodynamics I	3
REQUIRED EMPHASIS COURSE	3
COMM 1100 Intro Public Speaking	3
HIST 2111/2112 American History	3

Spring Semester

Course	Credit Hours
ENGR 2180 Intro Model Dyn Systems	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
World Language & Culture	3

Total Credit Hours **18**

15

Year Four**Fall Semester**

Course	Credit Hours
ENGR 4140 Systems Modeling	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
World Language & Culture	3

Spring Semester

Course	Credit Hours
ENGR 4920 Engr Design Project	4
EMPHASIS ELECTIVE	3
EMPHASIS ELECTIVE	3
EMPHASIS ELECTIVE	3
World Language & Culture	3

Total Credit Hours **15**

16

***MAJOR RELATED ELECTIVE:** Select from ANTH 1102 Introduction to Anthropology, FANR 2200 International Issues in Natural Resources & Conservation, or GEOG 1125 Resources, Society & the Environment

Courses in BOLD require a grade of "C" or better

THE FUNDAMENTALS OF ENGINEERING (FE) & PRE-FE EXAMS ARE GRADUATION REQUIREMENTS FOR THIS DEGREE PROGRAM

Students should select an Area of Emphasis (30 credit hours). To declare you Area of Emphasis, submit a Change of Major Form indicating your choice of emphasis area to the Academic Office (Rm. 120).

Electrical & Electronic Systems

Required Area of Emphasis Courses

ENGR 3270	Electronics I
ENGR 4210	Linear Systems
ENGR 4220	Feedback Controls
ENGR 4230	Sensors & Transducers
ENGR 4240	Intro Microcontrollers
ENGR 4250	Advanced Microcontrollers
ENGR 4270	Electronics II

Elective Area of Emphasis Courses – Choose 3 courses

ENGR 3520	Mass Transport and Rate Phenomena
ENGR 3540	Physical Unit Operations
ENGR 4260	Introduction to Nanoelectronics
ENGR 4310	Embedded Robotics
ENGR 4540	Applied Machine Vision
ENGR 4650	Control Structural Environments
ENGR 4660	Sustainable Building Design
ENGG 4620	Biomedical Imaging

Mechanical Systems

Required Area of Emphasis Courses

ENGR 2130	Dynamics
ENGR 2140	Strength of Materials
ENGR 3270	Electronics I
ENGR 3300	Mechanisms & Machine Kinematics
ENGR 4300	Mechanical Systems
ENGR 4340	Machine Hydraulics
ENGR 4350	Intro to Finite Element Analysis

Elective Area of Emphasis Courses – Choose 3 courses

ENGR 3520	Mass Transport and Rate Phenomena
ENGR 3540	Physical Unit Operations
ENGR 3610	Structural Design
ENGR 4210	Linear Systems
ENGR 4220	Feedback Control Systems
ENGR 4230	Sensors & Transducers
ENGR 4240	Intro Microcontrollers
ENGR 4250	Advanced Microcontrollers
ENGR 4310	Embedded Robotics
ENGR 4490	Renewable Energy Engineering
ENGR 4540	Applied Machine Vision
ENGR 4650	Control Structural Environments
ENGR 4660	Sustainable Building Design

Natural Resource Management

Required Area of Emphasis Courses

ENGR 2140	Strength of Materials
ENGR 3120	Spatial Data Analysis
ENGR 3410	Intro to Natural Resource Engineering
ENGR 3440	Water Management
ENGR 4440	Environ. Engr Unit Operations
ENGR 4650	Control Structural Environments
ENGR 4660	Sustainable Building Design

Elective Area of Emphasis Courses – Choose 3 courses

ENGR 3420	Introduction to Soil Mechanics
ENGR 3520	Mass Transport and Rate Phenomena
ENGR 3610	Structural Design
ENGR 4161/L	Environmental Microclimatology
ENGR 4171	Ocean & Atmospheric Dynamics
ENGR 4230	Sensors & Transducers
ENGR 4240	Intro Microcontrollers
ENGR 4410	Open Channel Hydraulics
ENGR 4700L	Hydrology, Geology & Soils GA
CRSS 4600	Soil Physics
CRSS 3060/L	Soils & Hydrol or WASR 4500 Quant Method Hydrol

Structural Systems

Required Area of Emphasis Courses

ENGR 2140	Strength of Materials
ENGR 3420	Introduction to Soil Mechanics
ENGR 3610	Structural Design
ENGR 4610	Design of Light Frame Steel Structures
ENGR 4630	Design of Residential Structures
ENGR 4650	Control Structural Environments
ENGR 4660	Sustainable Building Design

Elective Area of Emphasis Courses – Choose 3 courses

ENGR 3120	Spatial Data Analysis (Surveying, GIS, GPS)
ENGR 3300	Mechanism and Machine Kinematics
ENGR 3410	Intro. to Natural Resource Engineering
ENGR 3440	Water Management
ENGR 4210	Linear Systems
ENGR 4220	Feedback Control Systems
ENGR 4350	Intro Finite Element Analysis
ENGR 4440	Environ. Engr. Unit Operations
ENGR 3520	Mass Transport and Rate Phenomena

Process Operations

Required Area of Emphasis Courses

ENGR 2140	Strength of Materials
ENGR 3270	Electronics I
ENGR 3540	Physical Unit Operations
ENGR 4210	Linear Systems
ENGR 4220	Feedback Control Systems
ENGR 4230	Sensors & Transducers
ENGR 4240	Intro Microcontrollers

Elective Area of Emphasis Courses – Choose 3 courses

ENGR 4250	Advanced Microcontrollers	FDST 4090	Food Quality Control
ENGR 4350	Intro to Finite Element Analysis	FORS 3500	Wood Prop & Utilization
ENGR 4490	Renewable Energy Engineering	MGMT 3000	Mgmt Organizations
ENGR 4540	Applied Machine Vision	MGMT 4000	Integrated Rsrce Mgmt
FDST 4010	Food Processing	MGMT 4240	Quality Management
FDST 4050	Food Engr Fundamentals I	MGMT 4250	Productivity Management
FDST 4060	Food Engr Fundamentals II	POUL 4860	Poultry Processing

**BSBE BIOLOGICAL ENGINEERING
Fall 2013**

Year One**Fall Semester**

Course	Credit Hours
ENGR 1120 Engineering Graphics	3
ENGR 1140 Comp Methods	2
MATH 2250 Calculus I Sci Engr	4
CHEM 1211 & L Chemistry I	4
ENGL 1101 English Comp I	3

Spring Semester

Course	Credit Hours
MATH 2260 Calculus II Sci Engr	4
CHEM 1212 & L Chemistry II	4
PHYS 1251 Physics for Engineers I	3
BIOL 1103 & L Basic Concepts of Biology	4
FYOS 1001 First-Year Odyssey	1

Total Credit Hours**16****16****Year Two****Fall Semester**

Course	Credit Hours
MATH 2500 Multivariable Calculus	3
ENGR 2120 Statics	3
PHYS 1252 Physics for Engineers II	3
BIOL 1104 Organismal Biology	3
ENGL 1102 English Comp II	3

Spring Semester

Course	Credit Hours
MATH 2700 Differential Equations	3
ENGR 2110 Engr Decision Making	3
ENGR 2170 Electrical Circuits	3
ENGR 3160 Fluid Mechanics	3
ENGR 2920 Engr Design Methods	2
CHEM 2211 & L Organic Chemistry	4

Total Credit Hours**15****18****Year Three****Fall Semester**

Course	Credit Hours
MCHE 3140 Engr Thermodynamics I	3
ENGR 3150 Heat Transfer	3
ENGR 3520 Mass Tran/Rate	3
MIBO 3500 Intro Microbiology	3
BCMB 3100 Intro Biochemistry	4

Spring Semester

Course	Credit Hours
ENGR 2140 Strength of Materials	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
REQUIRED EMPHASIS COURSE	3
POLS 1101 Political Science	3
World Language & Culture	3

Total Credit Hours**16****18****Year Four****Fall Semester**

Course	Credit Hours
SCIENCE ELECTIVE*	3
EMPHASIS ELECTIVE	3
EMPHASIS ELECTIVE	3
COMM 1100 Intro Public Speaking	3
HIST 2111/2112 American History	3

Spring Semester

Course	Credit Hours
ENGR 4920 Engr Design Project	4
EMPHASIS ELECTIVE	3
World Language & Culture	3
World Language & Culture	3
Social Science Elective	3

Total Credit Hours**15****16**

***SCIENCE ELECTIVE:** Suggested courses include BCMB(CHEM) 4110; BCMB(ENTO) 4200; CBIO(BIOL) 3400; CBIO(MIBO) 4100; CRSS 4600 & L; ECOL(BIOL) 3500-3500L; MIBO 4090; VPHY 3100

Courses in BOLD require a grade of "C" or better

BSBE Areas of Emphasis

Students should select an Area of Emphasis (18 credit hours). To declare your Area of Emphasis, submit a Change of Major Form indicating your choice of emphasis area to the Academic Office (Rm. 120).

Environmental Area of Emphasis

Required Area of Emphasis Courses

ENGR 3410 Intro to Natural Resource Engineering
 ENGR 3440 Water Management
 ENGR 4440 Environmental Engineering Unit Operations
 ENGR 4450 Environmental Engineering Remediation Design

Elective Area of Emphasis Courses – Choose 2 courses

ENGR 3420 Soil Mechanics
 ENGR 4410 Open Channel Hydraulics
 ENGR 4660 Sustainable Building Design
 CRSS 3060 Hydrology and Soils or WASR 4500 Quantitative Methods in Hydrology

Biochemical Area of Emphasis

Required Area of Emphasis Courses

ENGR 4230 Sensors and Transducers
 ENGR 4510 Biochemical Engineering
 ENGR 4520 Design of Biochemical Separations Processes
 ENGR 4650 Design of Structural Environments

Elective Area of Emphasis Courses – Choose 2 courses

ENGR 3540 Physical Units Operation
 ENGG 4615 Soft Materials

Biomedical Area of Emphasis

You must choose EITHER the Biomechanics OR the Instrumentation Track for this Area of Emphasis

Required Area of Emphasis Courses

Biomechanics Track

ENGR 3720 Engineering Physiology
 ENGR 4230 Sensors and Transducers
 ENGR 4740 Biomaterials
 ENGR 4760 Biomechanics

Instrumentation Track

ENGR 3720 Engineering Physiology
 ENGR 4230 Sensors and Transducers
 ENGR 4740 Biomaterials
 ENGR 4210 Linear Systems

Elective Area of Emphasis Courses – Choose 2 courses

Biomechanics Track

ENGR 3610 Structural Design
 ENGR 4350 Finite Elements
 ENGR 4650 Design of Structural Environments
 ENGG 4620 Biomedical Imaging

Instrumentation Track

ENGR 3270 Electronics
 ENGR 4240 Intro to Microcontrollers
 ENGR 4260 Intro to Nanoelectronics
 ENGG 4620 Biomedical Imaging

Major Requirements:

All students must earn a grade of "C" (2.0) or better in the following courses: ENGR 1120, ENGR 2110, ENGR 2120, ENGR 2140, ENGR 2170, MCHE 3140, ENGR 3150, ENGR 3160, ENGR 3520, MATH 2250, MATH 2260, MATH 2500, MATH 2700, PHYS 1251, PHYS 1252, BIOL 1107-1107L, CHEM 1211, CHEM 1211L, and CHEM 1212, CHEM 1212L. Except for those courses requiring a grade of "C" (2.0) or better, a maximum of two ENGR prefix courses with grades of "D" (1.0) may be used to satisfy graduation requirements.

Transfer Entrance Requirements into Major:

Overall GPA 2.7 for Transfer Students.

THE FUNDAMENTALS OF ENGINEERING & PRE-FE EXAMS ARE GRADUATION REQUIREMENTS FOR THIS DEGREE PROGRAM

**BSCE CIVIL ENGINEERING
Fall 2013**

Year One**Fall Semester**

Course	Credit Hours
ENGR 1120 Engineering Graphics	3
ENGR 1140 Comp Methods	2
MATH 2250 Calculus I Sci Engr	4
ENGL 1101 English Comp I	3
Social Science Elective	3
FYOS 1001 First-Year Odyssey	1

Total Credit Hours 16

Spring Semester

Course	Credit Hours
MATH 2260 Calculus II Sci Engr	4
PHYS 1251 Physics for Engineers I	3
COMM 1100 Speech Communication	3
ENGL 1102 English Comp II	3
LIFE SCIENCE ELECTIVE*	3

16

Year Two**Fall Semester**

Course	Credit Hours
ENGR 2110 Engr Decision Making	3
ENGR 2120 Statics	3
MATH 2500 Multivariable Calculus	3
CHEM 1211 & L Chemistry I	4
PHYS 1252 Physics for Engineers II	3

Total Credit Hours 16

Spring Semester

Course	Credit Hours
ENGR 2140 Strength of Materials	3
MCHE 3140 Engr Thermodynamics I	3
ENGR 3160 Fluid Mechanics	3
CVLE 2210 Prin Survey & Trans	2
MATH 2700 Differential Equations	3
Social Science Elective	3

17

Year Three**Fall Semester**

Course	Credit Hours
ENGR 2130 Dynamics	3
ENGR 3150 Heat Transfer	3
ENGR 3410 Intro to Nat Res Engr	3
ENGR 3610 Structural Design	3
ENGR 4660 Sustainable Bldg Design	3
CVLE 3460 Civil Engr Lab – Hydraulics	1

Total Credit Hours 16

Spring Semester

Course	Credit Hours
ENGR 3420 Soil Mechanics	3
CVLE 2710 Numerical Meth Engr	2
CVLE 3310 Civil Engr Materials	3
CVLE 3730 Civil Engr Proj Mgmt	2
CVLE 3450 Civil Engr Lab – Soils	1
ENGINEERING ELECTIVE	3
World Language and Culture	3

17

Year Four**Fall Semester**

Course	Credit Hours
CVLE 3470 Civil Engr Lab – Structural	1
CVLE 4910 Capstone Design Project 1	2
ENGINEERING ELECTIVE	3
ENGINEERING ELECTIVE	3
ENGINEERING ELECTIVE	3
World Language and Culture	3

Total Credit Hours 15

Spring Semester

Course	Credit Hours
CVLE 4920 Capstone Design Project 2	2
ENGINEERING ELECTIVE	3
ENGINEERING ELECTIVE	3
ENGINEERING ELECTIVE	3
World Language and Culture	3
Social Science Elective	3

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*LIFE SCIENCE ELECTIVE: Select from BIOL 1104 Organismal Biology, MARS 1100 Natural Resources Conservation, or ECOL 1000 Ecological Basis of Environmental Issues

Courses in BOLD require a grade of "C" or better

BSCE Electives

Choose 7 classes from at least 2 of the following tracks: Geotechnical, Hydraulics, Structures, or Infrastructure Engineering. At least 3 design courses (indicated by *italics*) must be selected.

A. Geotechnical

- CVLE 4420 Adv. Soil Mechanics
- CVLE 4430 Groundwater Engineering
- CVLE4440 Design with Geo-synthetics*
- CVLE 4450 Geotechnical Structures – Foundation & Retaining Walls*

B. Hydraulics

- WASR 4500 Quan. Methods in Hydrology
- ENGR 3440 Hydraulics of Closed Conduit Flow*
- ENGR 4410 Open Channel Hydraulics*

C. Infrastructure Engineering

- ENGR 3120 Spatial Data Analysis
- ENGR 4650 Control of Struc. Environments
- ENVE 4710 GIS for Urban Engineering, Planning & Development
- CVLE 4730 Project Estimating and Planning
- CVLE 4740 Life Cycle Analysis
- CVLE 4750 Building Information Modeling (BIM)
- CVLE 4760 Commercial Building Systems*
- CVLE4770 Urban Infrastructure Systems*

D. Structural Engineering

- ENGR 4350 Finite Element Analysis
- ENGR 4610 Design of Steel Structures*
- ENGR 4630 Design of Residential Structures*
- CVLE 4330 Adv. Structural Analysis
- CVLE 4530 Design of Reinforced Concrete Structures*
- CVLE 4540 Adv. Des. of Reinforced Conc. Structures*
- CVLE 4620 Adv. Design of Steel Structures*
- CVLE 4810 Design of Wood Structures*

Major Requirements:

All students must earn a grade of "C" (2.0) or better in the following engineering courses: MATH 2250, MATH 2260, MATH 2500, MATH 2700, CHEM 1211-1211L, PHYS 1251, PHYS 1252, ENGR 1120, ENGR 2110, ENGR 2120, ENGR 2130, ENGR 2140, MCHE 3140, ENGR 3150, ENGR 3160. Except for those ENGR courses requiring a grade of C (2.0) or better, a maximum of two ENGR or CVLE prefix courses with grades of D (1.0) may be used to satisfy graduation requirements. Competency in a computer programming language is expected and may be satisfied with ENGR 1140.

Transfer Entrance Requirements into Intended Major:

Overall GPA 2.7 for Transfer Students.

THE FUNDAMENTALS OF ENGINEERING (FE) & PRE-FE EXAMS ARE GRADUATION REQUIREMENTS FOR THIS DEGREE PROGRAM

**BSCSE Computer Systems Engineering Degree Program
Fall 2013**

Year One**Fall Semester**

Course	Credit Hours
MATH 2250 Calculus I Sci Engr	4
CSEE 2210 Intro Computer Systems Engr	3
CSCI 1301 Intro Computing & Program	4
ENGL 1101 English Comp 1	3
FYOS 1001 First-Year Odyssey	1

Total Credit Hours 15

Spring Semester

Course	Credit Hours
MATH 2260 Calculus II Sci Engr	4
CSCI 1302 Software Development	4
CSCI 2611 Discrete Math for Engr	3
PHYS 1251 Physics for Engineers I	3
Social Science Elective	3

Total Credit Hours 17

Year Two**Fall Semester**

Course	Credit Hours
MATH 2500 Multivariable Calculus	3
CSEE 2220 Logic Design	3
PHYS 1252 Physics for Engineers II	3
CSCI 1730 Systems Programming	4
ENGL 1102 English Comp 2	3

Total Credit Hours 16

Spring Semester

Course	Credit Hours
MATH 2700 Differential Equations	3
ENGR 2120 Statics	3
ENGR 2170 Electrical Circuits	3
CSCI 2720 Data Structures	4
World Language and Culture	3

Total Credit Hours 16

Year Three**Fall Semester**

Course	Credit Hours
ENGR 2110 Engr Decision Making	3
CSEE 4230 Embedded Systems	3
CSEE 4270 Design Digital Systems	3
ENGR 4230 Sensors & Transducers	3
ENGG 2090 Probability & Statistics	3

Total Credit Hours 15

Spring Semester

Course	Credit Hours
ENGR 2920 Engineering Design Proj	2
ENGR 3270 Electronics I	3
CSEE 4280 Adv Digital Design	3
BSCSE ELECTIVE	3
Social Science Elective	3
Humanities & the Arts	3

Total Credit Hours 17

Year Four**Fall Semester**

Course	Credit Hours
ENGR 4210 Linear Systems	3
BSCSE ELECTIVE	3
BSCSE ELECTIVE	3
BSCSE ELECTIVE	3
Social Science Elective	3
World Language and Culture	3

Total Credit Hours 18

Spring Semester

Course	Credit Hours
CSEE 4920 Senior Design	4
BSCSE ELECTIVE	3
BSCSE ELECTIVE	3
BIOL 1103 Basic Concepts of Biology	3
World Language and Culture	3

Total Credit Hours 16

Courses in BOLD require a grade of "C" or better

BSCSE Electives

Select from no more than **two (2)** tracks. At least **3** electives with either a CSEE or ENGR or ENGG prefix must be selected.

A. Computer Hardware Systems

CSCI 4150 Numerical Simulation in Science & Engineering
 CSCI 4730 Operating Systems
 CSCI 4740 Real Time Systems
 CSCI 4760 Computer Networks
 CSEE 4210 Digital Signal Processing
 CSEE 4240 Sensor Networks

B. Mechatronics

CSCI 4150 Numerical Simulation
 CSCI 4530 Introduction to Robotics
 CSCI 4830 Virtual Reality
 CSEE 4310 Embedded Robotics
 CSEE 4530 Intro Optical Engr
 ENGR 4220 Feedback Controls
 ENGR 4270 Electronics II
 ENGR 4540 Applied Machine Vision

C. Biological Systems

CSCI 4490 Algorithms for Comp. Biology
 CSCI 4150 Numerical Simulation
 CSEE 4630 Instrumentation for Monitoring Biological Signals
 ENGG 4620 Biomedical Imaging
 ENGR 4220 Feedback Controls
 MATH 4780 Mathematical Biology

Major Requirements:

All students must earn a grade of "C" (2.0) or better in each of the following courses: ENGR 2110, ENGR 2120, ENGR 2170, MATH 2250, MATH 2260, MATH 2500, MATH 2700, PHYS 1251, PHYS 1252, CSCI 1301-1301L, CSCI 1302, CSEE 2210 and CSEE 2220. Except for those courses requiring a grade of "C" (2.0) or better, a maximum of two ENGR or CSEE prefix courses with grades of "D" (1.0) may be used to satisfy graduation requirements.

Transfer Entrance Requirements into Intended Major:

Overall GPA 2.7 for Transfer Students.

BSEE ELECTRICAL ENGINEERING – Fall 2013**Year One****Fall Semester**

Course	Credit Hours
ELEE 1030 Intro to EE	3
MATH 2250 Calculus I Sci Engr	4
BIOL 1104 Organismal Biology	3
ENGL 1101 English Comp I	3
Social Science Elective	3
FYOS 1001 First-Year Odyssey	1

Spring Semester

Course	Credit Hours
CSEE 2220 Logic Design	3
MATH 2260 Calculus II Sci Engr	4
PHYS 1251 Physics for Engineers I	3
ENGL 1102 English Comp II	3
World Language & Culture	3

Total Credit Hours**17****16****Year Two****Fall Semester**

Course	Credit Hours
ELEE 2040 Programming for EE	3
MATH 2500 Multivariable Calculus	3
ENGG 2090 Probability & Statistics	3
PHYS 1252 Physics for Engineers II	3
CHEM 1211 & L Chemistry I	4

Spring Semester

Course	Credit Hours
ENGINEERING SCIENCE ELECTIVE*	3
ENGR 2110 Engr Decision Making	3
ENGR 2170 Electrical Circuits	3
MCHE 3140 Engr Thermodynamics I	3
MATH 2700 Differential Equations	3

Total Credit Hours**16****15*****Engineering Science Elective: Select from ENGR 2120 Statics or ENGR 3150 Heat Transfer****Year Three****Fall Semester**

Course	Credit Hours
ELEE 4020 Electromagnetics	3
ENGR 3270 Electronics I	3
ENGR 4210 Linear Systems	3
COMM 1100 Intro to Public Speaking	3
World Language & Culture	3

Spring Semester

Course	Credit Hours
CSEE 4210 Digital Signal Processing	3
ELEE 3020 EE Design Lab	2
ELEE 4710 Fundamentals of Power	3
ENGR 4220 Feedback Control	3
ENGR 4240 Microcontrollers	3
ENGR 4270 Electronics II	3

Total Credit Hours**15****17****Year Four****Fall Semester**

Course	Credit Hours
ELEE 4910 EE Capstone Design I	2
EE TRACK ELECTIVE	3
EE TRACK ELECTIVE	3
EE TRACK ELECTIVE	3
Social Science Elective	3
World Language & Culture	3

Spring Semester

Course	Credit Hours
ELEE 4920 EE Capstone Design II	2
EE TRACK ELECTIVE	3
EE TRACK ELECTIVE	3
EE TRACK ELECTIVE	3
NON-EE ELECTIVE**	3
Social Science Elective	3

Total Credit Hours**17****17******NON-EE ELECTIVE: Suggested areas include Business, Foreign Language, Other Engineering Fields or Other Fields approved by BSEE Curriculum Coordinator****Courses in BOLD require a grade of "C" or better**

BSEE Elective Tracks

Students must select elective courses from one of the following Tracks (18 credit hours).

Microelectronics Track

Required Courses – (9 credit hours)

ELEE 4120 Microelectronics Devices and Circuits
 ELEE 4170 Analog Integrated Circuits
 ELEE 4590 Principles of Communication Systems

Elective Courses – Choose 3 courses

CSEE 4240 Wireless Sensor Networks
 CSEE 4270 Design of Digital Systems
 CSEE 4530 Intro to Optical Engineering
 ELEE 4145 Principles of Laser and Photonics
 ELEE 4545 Engineering Entrepreneurship
 ENGR 4230 Sensors and Transducers
 ENGR 4250 Advanced Microcontrollers
 ENGR 4260 Intro to Nano-electronics

Industrial Automation and Control Track

Required Courses – (9 credit hours)

ELEE 4235 Applied Process Control
 ENGR 4230 Sensors and Transducers
 ENGR 4250 Advanced Microcontrollers

Elective Area of Emphasis Courses – Choose 3 courses

CSEE 4240 Wireless Sensor Networks
 CSEE 4270 Design of Digital Systems
 CSEE 4320 Mechatronics
 ELEE 4275 Advanced Control Systems
 ELEE 4545 Engineering Entrepreneurship
 ELEE 4590 Principles of Communication Systems
 ENGR 2100 Principles of Systems Engineering
 ENGR 4540 Applied Machine Vision

Power Systems Track

Required Courses – (9 credit hours)

ELEE 4720 Electrical Machines
 ELEE 4735 Analytical Methods in Power Systems
 ELEE 4745 Power Electronics

Elective Courses – Choose 3 courses

ELEE 4545 Engineering Entrepreneurship
 ELEE 4715 Power Distribution
 ELEE 4725 Analysis of Power Systems
 ELEE 4755 Power Electronics Dynamics and Control
 ENGR 2100 Principles of Systems Engineering
 ENGR 4230 Sensors and Transducers

Major Requirements:

All students must earn a grade of "C" (2.0) or better in the following courses: CSEE 2220, ELEE 1030, ELEE 2040, ENGR 2120 or ENGR 3150, ENGR 2170, MATH 2250, MATH 2260, MATH 2500, MATH 2700, PHYS 1251 or PHYS 1211-1211L, PHYS 1252 or PHYS 1212-1212L. Except for those courses requiring a grade of "C" (2.0) or better, a maximum of two (CSEE, ELEE or ENGR) prefix courses with grades of "D" (1.0) may be used to satisfy graduation requirements.

Transfer Entrance Requirements into Major:

Overall GPA 2.7 for Transfer Students.

THE FUNDAMENTALS OF ENGINEERING (FE) EXAM & THE PRE-FE EXAM ARE GRADUATION REQUIREMENTS FOR THIS DEGREE PROGRAM

BSME Mechanical Engineering – 2015-2016

Year One

Fall Semester		Spring Semester	
Course	Credit Hours	Course	Credit Hours
ENGR 1120 Engr. Graphics & Design	2	ENGR 1140 Comp. Eng. Methods	2
ENGR 1920 Introduction to Engineering	1	MCHE 1940 Design Studio & Prof. Practice	3
MATH 2250 Calculus I Science & Eng	4	MATH 2260 Calculus II Science & Eng	4
FYOS 1001 First-Year Odyssey Seminar	1	PHYS 1251 Physics for Engineers I	3
ENGL 1101 English Comp. I	3	ENGL 1102 English Comp. II	3
COMM 1100 Intro Public Speaking	3		
Social Science Elective	3		
Total Credit Hours	17	Total Credit Hours	15

Year Two

Fall Semester		Spring Semester	
Course	Credit Hours	Course	Credit Hours
ENGR 2120 Statics	3	ENGR 2170 Electrical Circuits	3
MCHE 2990 Engr Systems in Society	3	ENGR 2140 Strength of Materials	3
MATH 2500 Multivariable Calculus	3	ENGR 2130 Dynamics	3
PHYS 1252 Physics for Engineers II	3	MCHE 3140 Eng. Thermodynamics I	3
CHEM 1211&L Chemistry I	4	MATH 2700 Differential Equations	3
Total Credit Hours	16	Total Credit Hours	15

Year Three

Fall Semester		Spring Semester	
Course	Credit Hours	Course	Credit Hours
MCHE 3310 Engineering Materials	3	CVLE 2710 Numerical Methods for Engineers	2
MCHE 3920 Mfg. & Design Studio	3	ENGR 3150 Heat Transfer	3
ENGR 3300 Mechanisms & Kinematics	3	ME TRACK ELECTIVE	3
ENGR 3160 Fluid Mechanics	3	*** Biological Science requirement	3
ENGR 4210 Linear Systems	3	ENGR 4220 Feedback Control Systems	3
MCHE 4000 ME Professional Practice	2	MCHE 3450 Mechanical Engineering Lab	2
Total Credit Hours	17	Total Credit Hours	16

Year Four

Fall Semester		Spring Semester	
Course	Credit Hours	Course	Credit Hours
Social Science Elective	3	World Language & Culture	3
MCHE 4910 ME Capstone Design I	2	MCHE 4920 ME Capstone Design II	2
ME TRACK ELECTIVE	3	ME TRACK ELECTIVE	3
* MAJOR-RELATED ELECTIVE	3	ME TRACK ELECTIVE	3
** MCHE 4390 Mechanical Vibration <u>OR</u>		** ENGR 4300 Mechanical Systems <u>OR</u>	
World Language & Culture	3	World Language & Culture	3
World Language & Culture	3	Social Science Elective	3
Total Credit Hours	17	Total Credit Hours	17

*MAJOR-RELATED ELECTIVE: Suggested courses include ECOL 3070, EDES 4610, EDES 4660, EHSC 3060, ETES 5060, FDST 4050,

HPRB 4450. Co-op, Research, Engineering or courses from Other Fields approved by BSME Curriculum Coordinator.

**ALTERNATIVE CLASS CHOICE (Choose ONE): Either MCHE 4390 in Fall Term or ENGR 4300 in Spring Term

*** BIOLOGICAL SCIENCE REQUIREMENT ELECTIVE: Choose one. Either BIOL 1103 or BIOL 1104 or BIOL 1107 or BIOL 1108

Courses in BOLD require a grade of "C" or better

BSME Elective Tracks

*Students must select **four** elective courses from the following Tracks (12 credit hours).*

Advanced Energy Systems Track

ENGR 4490 Renewable Energy Engineering
ENGR 4650 HVAC Systems for Buildings & Industry
ENVE 4530 Energy & Env Policy Analysis
MCHE 3150 Engineering Thermodynamics II
MIST 4550 Energy Informatics

Advanced Mechanics Track

ENGR 4300 Mechanical Systems
ENGR 4350 Intro Finite Element Analysis
ENGR 4760 Biomechanics
MCHE 4360 Robotics I
MCHE 4380 Solid Mechanics
MCHE 4810 Intro to Micro and Nano Systems
MCHE 4820 Mechatronics
MCHE 4500 Advanced Thermal Fluid Systems

Architectural Engineering Track

CVLE 3730 Civil Engineering Project Management
CVLE 4730 Construction Project Management
CVLE 4740 Life Cycle Analysis
CVLE 4750 Building Information Modeling
CVLE 4760 Commercial Building Systems
ENGR 4630 Engr Dsgn of Residential Structures
ENGR 4650 HVAC Systems for Buildings & Industry
ENGR 4660 Sustainable Building Design
MIST 4550 Energy Informatics

Industrial Design and Processes Track

CVLE 3730 Civil Engineering Project Management
CVLE 4730 Construction Project Management
CVLE 4740 Life Cycle Analysis
ENGR 3540 Physical Unit Operations
ENGR 4230 Sensors and Transducers
ENGR 4340 Machine Hydraulics
ENGR 4540 Applied Machine Vision
ENGR 4650 HVAC Systems for Buildings & Industry
MCHE 3150 Engineering Thermodynamics II
MCHE 4410 Industrial Process Design
MCHE 4420 Industrial Controls
MCHE 4500 Advanced Thermal Fluid Systems

Modeling and Controls Track

CVLE 4750 Building Information Modeling
ENGR 4230 Sensors and Transducers
ENGR 4240 Intro to Microcontrollers
ENGR 4250 Advanced Microcontrollers
ENGR 4350 Intro Finite Element Analysis
ENGR 4650 HVAC Systems for Buildings & Industry
MCHE 4410 Industrial Process Design
MCHE 4420 Industrial Controls
MCHE 4360 Robotics I
MIST 4550 Energy Informatics
ELEE 4235 Applied Process Control

Major Requirements:

All students must earn a grade of "C" (2.0) or better in the following courses: BIOL 1103 or 1104 or 1107, CHEM 1211, CHEM 1211L, ENGR 1120, ENGR 1140, ENGR 2120, ENGR 2130, ENGR 2140, ENGR 2170, ENGR 3150, ENGR 3160, MATH 2250, MATH 2260, MATH 2500, MATH 2700, MCHE 3140, PHYS 1251 or PHYS 1211-1211L, PHYS 1252 or PHYS 1212-1212L. Except for those courses requiring a grade of "C" (2.0) or better, a maximum of two (ENGR or MCHE) prefix courses with grades of "D" (1.0) may be used to satisfy graduation requirements.

Transfer Entrance Requirements into Major:

Overall GPA 2.7 for Transfer Students.

THE FUNDAMENTALS OF ENGINEERING (FE) EXAM & THE PRE-FE EXAM ARE GRADUATION REQUIREMENTS FOR THIS DEGREE PROGRAM

A.B. in German
DEGREE REQUIREMENTS

TOTAL DEGREE HOURS 120 hours

I. FOUNDATION COURSES (9 HOURS)

ENGL 1101 or ENGL 1101E or ENGL 1101S

ENGL 1102 or ENGL 1102E or ENGL 1103 or ENGL 1050H or ENGL 1060H

MATH 1101 or MATH 1113 or MATH 2200 or MATH 2250 or MATH 2300H or MATH 2400 or
MATH 2400H or MATH 2410 or MATH 2410H

II. SCIENCES (7-8 HOURS)

At least one of the physical science or life science courses must include a laboratory.

Physical Sciences (3-4 hours)

Preferred Course(s): Please consider the Franklin College's Physical Sciences requirement when selecting courses from the Core Curriculum. Some courses approved for the core curriculum do not satisfy the Franklin College requirement.

Life Sciences (3-4 hours)

Preferred Course(s): Please consider the Franklin College's Biological Sciences requirement when selecting courses from the Core Curriculum. Some courses approved for the core curriculum do not satisfy the Franklin College requirement.

III. QUANTITATIVE REASONING (3-4 HOURS)

No preferred courses for this area.

IV. WORLD LANGUAGES AND CULTURE, HUMANITIES AND THE ARTS (12 HOURS)

World Languages and Culture (9 hours)

No preferred courses for this area.

Humanities and the Arts (3 hours)

No preferred courses for this area.

V. SOCIAL SCIENCES (9 HOURS)

Students who have not met the Georgia and U.S. Constitution requirement by examination should enroll in POLS 1101.

A passing grade on an examination on the history of the United States and Georgia is required to satisfy the United States and Georgia History Requirement for all persons receiving a baccalaureate degree from the University, unless exempted by one of the following courses: HIST 2111, HIST 2112.

No preferred courses for this area. See Core Curriculum view.

Area VI

GRMN 2001

GRMN 2002 or GRMN 2140H

GRMN 2300

LING 2100 or LING 2100H

Six additional hours preferably taken from the following areas:

Additional Foreign Language, ANTH, ARGD, ARHI, ARID, ARST, ARTS, CMLT, COMM, DRAM, ECON, GEOG, HIST (world), LING, MUSI, PHIL, POLS, WMST

If any of the courses in Area VI have been used to satisfy Areas II-V of the Core Curriculum, General Electives may be taken here. (Refer to College-wide requirements when selecting General Electives)

MAJOR REQUIREMENTS

A baccalaureate degree program must require at least 21 semester hours of upper division courses in the major field and at least 39 semester hours of upper division work overall. Students in the Franklin College must earn a grade of "C" (2.0) or better in major required courses.

Required Courses (24 hours)

GRMN 3010 or GRMN 3070

GRMN 3020 or GRMN 3080

GRMN 4520

Fifteen (15) additional hours of GRMN courses at the 3000/4000-level (excluding GRMN 3500) one of which may be a GRMN course taught in English translation. (Courses taught in English translation: GRMN 3300, GRMN 3550, GRMN 3600H, GRMN 3840, GRMN 4210, GRMN 4410/6410, GRMN 4610H)

General Electives (36 hours)

(Refer to College-wide requirements when selecting general electives.)

Upper division (15 hours)

Any level (21 hours)

(It is recommended that students complement course work in the major with courses in ARGD, ARHI, ARID, ARST, ARTS, CMLT, ECON, ENGL, HIST (German/European History), LING, MUSI, PHIL, POLS, or other related subjects.)

* The Department of Germanic and Slavic Studies does not allow course challenges for any of its courses (GRMN, RUSS, SCAN, SLAV).

**For students who are in the dual program of study in both German A.B. and World Language Education B.S.Ed., it is recommended that you review requirements found at <http://bulletin.uga.edu/MajorSpecific.aspx?MajorId=160> which shows how courses and requirements in the two majors may overlap.

(This total does not include the 1-hour P.E. requirement)