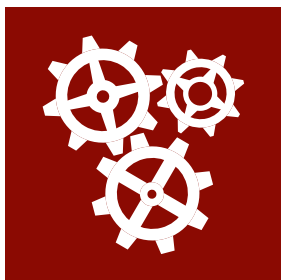
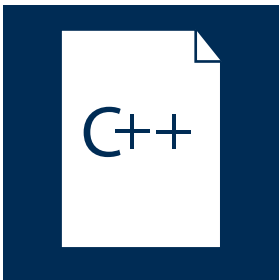
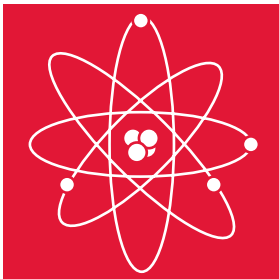
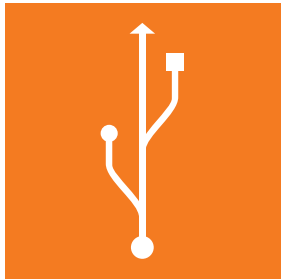
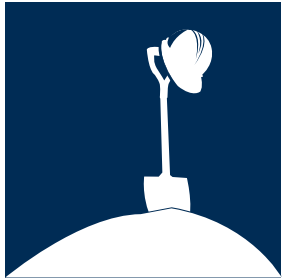
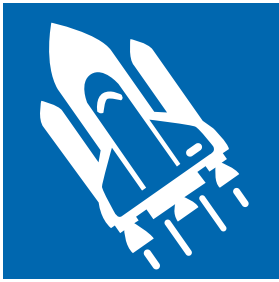


2014 - 2015

ENGINEERING

CURRICULUM & MAJORS GUIDE



KU ENGINEERING CURRICULUM & MAJORS GUIDE 2014-2015

TABLE OF CONTENTS

Admission Criteria	2
Scholarships	2
Why Choose KU	3-4
Bioengineering	5
Transfer to KU	5
Dual Degree with Business	5
Self Engineering Leadership Fellows Program	6
KU Core and understanding the guide.....	7
aerospace engineering	8-9
architectural engineering.....	10-11
chemical engineering.....	12-14
biomedical concentration.....	14
environmental concentration	14
premedical concentration	14
petroleum concentration	14
civil engineering.....	15-17
and business administration.....	15
environmental concentration	17
computer engineering.....	18-19
computer science	20-21
electrical engineering	22-23
engineering physics.....	24-28
aerospace systems	25
chemical systems.....	26
digital electronic systems	27
electromechanical control systems.....	28
information technology	29-30
interdisciplinary computing	31-36
astronomy.....	32
biology	33
chemistry	34
geography	35
physics	36
mechanical engineering.....	37-39
biomechanics concentration.....	39
pre-medical plan	39
and business administration.....	39
petroleum engineering.....	40-41

GENERAL INFORMATION

Information in this guide is subject to change. Please talk with the departmental adviser about degree requirements on a regular basis. Complete course descriptions are available in the Undergraduate Catalog at www.catalogs.ku.edu. Click the link for Engineering. Information on salary ranges is the most recently available through the KU Engineering Career Center and the National Association of Colleges and Employers.

CONTACT US:

If you have questions about engineering or computing programs at the University of Kansas, please get in touch with us.

**785-864-3881 • studyengineering@ku.edu
or go online, www.engr.ku.edu**

You can reach us through the mail or visit us at:

The KU School of Engineering
Eaton Hall
1520 W. 15th Street, Room 1
Lawrence, KS 66045-7608

The online application for admission to the University of Kansas and the KU School of Engineering can be found at www.admissions.ku.edu.

This document was produced by the KU School of Engineering Public Relations Office.

The University of Kansas prohibits discrimination on the basis of race, color, ethnicity, religion, sex, national origin, age, ancestry, disability, status as a veteran, sexual orientation, marital status, parental status, gender identity, gender expression and genetic information in the University's programs and activities. The following person has been designated to handle inquiries regarding the nondiscrimination policies: Director of the Office of Institutional Opportunity and Access, IOA@ku.edu, 1246 W. Campus Road, Room 153A, Lawrence, KS 66045, 785-864-6414, 711 TTY.

ADMISSION CRITERIA

GETTING IN – FRESHMEN ENTERING FALL 2015

The University of Kansas School of Engineering admits students on a competitive basis. To be considered for admission, an incoming freshman must:

- Graduate in the top 50 percent of their high school class,
- Have a minimum score of 22 on the math portion of the ACT (540 on the math portion of the SAT) or better,
AND
- Have at least a 3.0 unweighted GPA on a 4.0 scale.

However, five School of Engineering majors set the bar even higher. Architectural engineering, computer engineering, computer science, electrical engineering and interdisciplinary computing require a minimum math ACT score of 28 (640 math SAT) before applicants will be considered. So just meeting the school's minimum requirements doesn't guarantee admission into a specific degree program.

Having a better academic standing improves your ability to gain admission into KU's engineering programs.

GETTING IN – TRANSFER STUDENTS

All applications are evaluated individually, however students must have a college GPA of 2.5 or higher. Students must submit their ACT or SAT scores or proof of competence in calculus (a grade of C or better).

Students are admitted to the information technology program as juniors. They must have completed pre-requisite courses and have a 2.5 cumulative GPA or better.

SCHOLARSHIPS

In addition to the university, the School of Engineering and most of its departments also offer scholarships. Funds are awarded on a competitive basis and to be considered, students must apply to KU and the School of Engineering by submitting their Undergraduate Application for Admission and Scholarships by Nov. 1. These awards are renewable when students meet renewal criteria, and the funds may combine with universitywide scholarships. No additional application is required.

ADDITIONAL SCHOLARSHIPS AND PROGRAMS THAT REQUIRE APPLICATIONS:

The School of Engineering also offers merit-based scholarships for students who participated in **FIRST Robotics Competition** (FRC) or the **FIRST Tech Challenge** (FTC). Qualifying FIRST participants must have a minimum math ACT score of 28 (640 math SAT) and a 3.5 unweighted GPA to be eligible for the scholarship. Applications are on the school's scholarship web page.

KU Engineering offers merit-based scholarships for students who participate in the **Project Lead The Way** (PLTW) curriculum. High school seniors attending a certified PLTW high school and who have completed the PLTW curriculum can apply. Applications are on the school's scholarship web page.

The **Engineering Generations Scholarship** is for high school seniors whose parent or grandparent earned a degree in engineering or computer science from KU. It's also for incoming students who are the first in their family to attend college. Applications are on the school's scholarship web page.

The **Self Engineering Leadership Fellows (SELF) Program** is an opportunity for motivated students with a love for science and math and a knack for involvement to further their leadership development. Learn more about the program and how to apply on page 6.

WHY CHOOSE THE KU SCHOOL OF ENGINEERING?



LABS & COMPUTING FACILITIES:

Between 2012 and Fall 2015, KU is adding more than 180,000 square feet of state-of-the-art teaching, research and project space to the Engineering Complex. KU students have top facilities and tools to use 24/7. Students pay an engineering fee per credit hour, which provides services, equipment, materials and facilities that engineering and computing students use every day.

TEACHERS:

Faculty – not graduate teaching assistants – teach 90 percent of our undergraduate classes. Engineering faculty members are recognized for their outstanding teaching skills, and they bring their own cutting-edge research into the classrooms. Also, engineering class sizes are generally small.

AFFORDABILITY:

The KU School of Engineering and its departments award additional scholarships to outstanding students. Those funds go to hundreds of undergraduate engineering students every year. Scholarships, partial tuition waivers and financial aid at the University of Kansas make KU's high-quality programs very affordable.

CAREER SERVICES:

The Engineering Career Center can help you develop the skills you need to find a summer internship and a job after graduation. The Career Center also helps students prepare for graduate school or professional program applications and interviews.

ACCREDITATION:

All engineering undergraduate degree programs are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The computer science undergraduate degree program is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>. The new programs in interdisciplinary computing and information technology will pursue accreditation through the CAC of ABET as soon as they are eligible.

INVOLVEMENT:

From Engineering Student Council, to Diversity Programs and the Society of Women Engineers to groups that build robots, formula-style cars, bridges and planes, there are plenty of ways for you to get involved in engineering and computing at KU.

PREMEDICAL:

Students interested in attending medical school will find many engineering disciplines that may help them achieve their goals. At KU, pre-medicine is a career interest rather than a major or degree program. Choosing a major in the School of Engineering can provide the science background medical schools look for and the academic rigor that prepares students for the challenges of medical school.

GRADUATE STUDY & PROFESSIONAL DEGREES:

Programs in the KU School of Engineering are rigorous and prepare students for advanced studies such as master's and doctoral programs or medical or law school. Many students pursue a graduate degree to gain expertise in a specific area. Here are recent examples of universities where KU School of Engineering students pursue advanced degrees:

Baylor College of Medicine	Texas A&M University
Boston University	University of Auckland
Carnegie Mellon University	Univ. of California - Los Angeles
Colorado School of Mines	Univ. of California - San Diego
Columbia University	Univ. of Cambridge, U.K.
Duke University	Univ. of Ill., Urbana-Champaign
Fordham University Law School	Univ. of Kansas
Georgia Tech	KU School of Law
Heriot-Watt University (Scotland)	KU School of Medicine
Massachusetts Inst. of Technology	Univ. of Southern California
Ohio State University	Univ. of Texas - Austin
Purdue University	Washburn Univ. School of Law
Rice University	West Virginia University
Stanford University	

STILL UNDECIDED ON A MAJOR?

It's OK if you're not sure which major is right for you. KU freshmen who haven't declared a major can enroll in an engineering and computing exploration course, ENGR 108. Most students who declare a major early in their first year can still complete their degree on time.

You can also learn more about majors right now.

Take Action

1. Check out these sites:

www.bls.gov/ooh/

www.careercornerstone.org

www.egfi-kl2.org

2. Job shadow a professional engineer

3. Tour KU and apply to the School of Engineering.

www.engr.ku.edu

785-864-3881

studyengineering@ku.edu

VISIT US

Learn about the University of Kansas and the School of Engineering with a campus visit. Contact the school's recruiting staff, 785-864-3881, studyengineering@ku.edu, to schedule a personalized visit at the KU School of Engineering that's more convenient for you. We can arrange tours of our great facilities and meetings with KU Engineering students and faculty. We'll take the time to listen to you and answer your questions. A campus visit is the best way to find out if KU is the right choice for you.

GO ONLINE

The Office of Admissions has a website loaded with information about the university. Go to: www.admissions.ku.edu.

Find out about research efforts and what's happening at the KU School of Engineering at: www.engr.ku.edu.

See what's up at the University of Kansas at: www.ku.edu.

CALL OR E-MAIL

785-864-3881

studyengineering@ku.edu

BIOENGINEERING

BIO CHOICES FOR THE CAREER YOU WANT

The KU School of Engineering offers several undergraduate degrees that let students pursue a concentration or option in bio-related disciplines. Current programs include:

- Chemical Engineering
biomedical concentration, premedical concentration, environmental concentration
- Civil Engineering
environmental concentration
- Interdisciplinary Computing
biology concentration
- Mechanical Engineering
biomechanics concentration, premedical study plan.

Faculty and staff also are developing a 4 + 1 curriculum option that will allow high-ability students to pursue any School of Engineering degree in 4 years, then earn a KU master's in Bioengineering the following year.

KU students are encouraged to engage in undergraduate research in any one of the many bioengineering research laboratories available at KU.

Employers often look for graduates who have ability in one of the primary engineering fields paired with a graduate degree in bioengineering. Students interested in becoming the next generation of researchers, educators and entrepreneurs in bioengineering should plan on earning a graduate degree.

TRANSFER TO KU

BEGIN THERE, FINISH HERE

We know there are lots of reasons students choose to begin their college education elsewhere – athletic scholarships, general education courses at community colleges and opportunities to live at home, or just a desire to experience another part of the country.

The KU School of Engineering is here for you to complete your engineering or computing degree.

The staff of the KU School of Engineering will work with you to gain admission to one of our degree programs, answer questions about credit transfers and introduce you to the support and services that will make you a proud member of the Jayhawk family.

All applications from transfer students are evaluated individually, however, students must have a college grade-point average of 2.5 or higher and must demonstrate calculus proficiency either through college credit or qualifying ACT/SAT scores.

For more information about becoming a Jayhawk, call 785-864-3881 or send an email to studyengineering@ku.edu. If you're a college student ready to come to KU now, you can start the process at www.admissions.ku.edu.

DUAL DEGREE WITH BUSINESS

Students in civil engineering or mechanical engineering can take advantage of a five-year program to graduate with bachelor's degrees in business and engineering. Students must complete degree requirements for their engineering program as well as for the School of Business degree program. Careful planning is important. Please consult an adviser.

SELF PROGRAM

SELF ENGINEERING

LEADERSHIP FELLOWS PROGRAM

The SELF program is about leaders, not test scores.

Goal-oriented, involved students who want to pursue a future in engineering or computing at the KU School of Engineering are eligible to apply for the Madison A. and Lila Self Engineering Leadership Fellows Program. **The SELF Program provides an enrichment program designed to help them become leaders in business and industry. It also provides an enviable four-year financial package.**

Students in the SELF Program will expand and refine their leadership, business, managerial, entrepreneurial, communication, interpersonal and engineering skills through mentoring, coursework and seminars, as well as leadership opportunities. The goal is to develop graduates who have a passion for technology and the skill set to guide the tech-based corporations of tomorrow.

While good grades are important, they aren't the only consideration. Every year, about 25 incoming freshmen with a track record of motivation, leadership and action will be selected for this innovative four-year program.

WHO'S ELIGIBLE TO APPLY?

Students who've been admitted to a program in the KU School of Engineering will be eligible to apply for the SELF Program. Strong candidates will be able to show a track record of attributes that relate to successful leadership.

THE APPLICATION AND SELECTION PROCESS

The SELF Program receives applications from high school seniors between Sept. 1 and Dec. 1 for entry into the program the following academic year. Candidates will need to tell us a little more about themselves, answer some short essay questions and gather letters of recommendation. Complete application details can be found online in the fall.

A committee will review all applications and invite the strongest candidates to take part in interviews. All applicants will be notified of their status in late March.

QUESTIONS

Questions about the SELF Program or application process should be directed to engrself@ku.edu, or 785-864-3881.

ABOUT THE BENEFACTORS

The SELF Program was made possible through a generous donation to KU Endowment by Madison A. and Lila Self. The Selves established the program with the intent that it makes a difference in the lives of students who will then rise to make a notable difference in the world. Madison "Al" Self was a 1943 KU chemical engineering graduate and successful businessman. The Selves, native Kansans who met at KU, were longtime and generous supporters of the university.

LEARN MORE

You'll find all the program details, including how to apply for the Self Engineering Leadership Fellows Program, at:

<http://www.engr.ku.edu/self/>



THE KU CORE AND YOUR GUIDE TO THE SCHOOL OF ENGINEERING CURRICULA

The KU Core is a flexible university-wide curriculum that all University of Kansas undergraduate students complete as part of their degree requirements. It ensures that when you graduate, you have knowledge and experiences that bring value and insight to your personal and career endeavors.

The KU Core stretches across the undergraduate experience, yielding fundamental skills, building a broad background of knowledge, generating capacities and opportunities for blending and creating ideas, strengthening an appreciation of cultural and global diversity, and cultivating ethical integrity.

Goals of the KU Core define the ambitions the University of Kansas has for its graduates. Each of the six educational goals has one or more distinct learning outcomes.

ENGINEERING CURRICULA

Faculty in the School of Engineering have defined how these outcomes can most easily or best be met and still ensure graduates are ready to

meet the needs of industry. As you review the curricula in this guide, you'll notice references to KU Core Electives.

Additional information about how the KU Core is incorporated – including KU Core charts for each School of Engineering major, like the one here – is available at www.engr.ku.edu and through each of the departments. You can also visit kucore.ku.edu to learn more about the advanced education goals and outcomes of KU Core.

MECHANICAL ENGINEERING KU CORE DISTRIBUTION	
	<u>CRITICAL THINKING & QUANTITATIVE LITERACY</u> CRITICAL THINKING: PHSX 211 QUANTITATIVE LITERACY: MATH 121
	<u>COMMUNICATION</u> WRITTEN COMMUNICATION: SIX HOURS OF ENGLISH COURSES ORAL COMMUNICATION: COMS 130
	<u>BREADTH OF KNOWLEDGE</u> ARTS & HUMANITIES: MEET VIA KU CORE REQUIREMENTS NATURAL SCIENCES: MATH 122 SOCIAL SCIENCES: ECON 104, 142 OR 144
	<u>CULTURE & DIVERSITY</u> DIVERSITY IN UNITED STATES: MEET VIA KU CORE REQUIREMENTS GLOBAL AWARENESS: MEET VIA KU CORE REQUIREMENTS
	<u>SOCIAL RESPONSIBILITY & ETHICS</u> ETHICS & SOCIAL RESPONSIBILITY: PHIL 160, 180 OR 320
	<u>INTEGRATION & CREATIVITY</u> CAPSTONE: ME 641, 642, 643, 644, OR 645
MECHANICAL ENGINEERING SPECIFIC GENERAL EDUCATION REQUIREMENTS: Must complete 6 hours of English courses, and must get credit for COMS 130. If activities are used to meet Culture & Diversity and Humanities, free elective courses must be used to fill remaining 128-hour degree requirement. Visit kucore.ku.edu/courses for approved courses and activities.	



AEROSPACE ENGINEERING

WHAT DO THEY DO?

Aerospace engineers design, develop, and test aircraft, spacecraft, and missiles and supervise manufacture of these products. Aerospace engineers also use aerospace technology in remote sensing and product-oriented fields, including the wind energy and automotive industries.

WHERE DO THEY WORK?

- Aircraft, guided missile and space vehicle industries
- National research laboratories
- Commercial airlines
- Federal government agencies
- Wind energy industry
- Automotive industry

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$54,600 - \$81,900

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU AEROSPACE ENGINEERS

Accenture	Aerospace Systems & Components
B/E Aerospace	Boeing
Bombardier/Learjet	CAV Aerospace
Cessna Aircraft	CymSTAR
Deloitte Consulting	Federal Aviation Administration
Frasca International	GTL Company
Hamilton Sundstrand	Honeywell
Honda R&D	Jacobs
Johns Hopkins Univ. Applied Physics Lab	
Missile Defense Agency	NASA
Porter McGuffie	Spirit AeroSystems
Textron	Tinker Air Force Base
United Launch Alliance	U.S. Air Force
U.S. Armed Forces	Valent Aerostructures
Virgin Galactic	Wetzel Engineering

TAKE ACTION

Tour the KU campus and apply early to the School of Engineering

www.ae.engr.ku.edu

www.engr.ku.edu

785-864-3881

studyengineering@ku.edu

AEROSPACE ENGINEERING CURRICULUM

135 credit hours required for graduation

FRESHMAN YEAR – FALL

	HOURS
AE 245 Introduction to Aerospace Engineering	3.0
AE 290 Aerospace Colloquium .....	.25
CHEM 150 Chemistry for Engineers	5.0
ENGL 101 Composition	3.0
MATH 121 Calculus I.....	5.0
TOTAL HOURS.....	16.25

FRESHMAN YEAR – SPRING

AE 290 Aerospace Colloquium .....	.25
ENGL 102 Critical Reading & Writing	3.0
MATH 122 Calculus II	5.0
PHSX 210 General Physics I.....	3.0
PHSX 216 General Physics I Laboratory	1.0
KU Core Electives*	6.0
TOTAL HOURS	18.25

SOPHOMORE YEAR – FALL

AE 211 Computing for Engineers	3.0
AE 290 Aerospace Colloquium .....	.25
AE 345 Fluid Mechanics	3.0
CE 301 Statics & Dynamics	5.0
MATH 220 Applied Differential Equations	3.0
PHSX 212 General Physics II.....	3.0
PHSX 236 General Physics II Laboratory.....	1.0
TOTAL HOURS.....	18.25

SOPHOMORE YEAR – SPRING

AE 290 Aerospace Colloquium .....	.25
AE 360 Introduction to Astronautics.....	3.0
AE 445 Aircraft Aerodynamics	3.0
CE 310 Strength of Materials	4.0
MATH 290 Elementary Linear Algebra	2.0
ME 312 Basic Engineering Thermodynamics,	3.0
TOTAL HOURS.....	15.25

JUNIOR YEAR – FALL

AE 290 Aerospace Colloquium .....	.25
AE 507 Aerospace Structures I.....	3.0
AE 545 Fundamentals of Aerodynamics	4.0
AE 550 Dynamics of Flight I.....	4.0
AE 571 Reciprocating Propulsion	3.0
MATH 223 Vector Calculus	3.0
TOTAL HOURS.....	17.25

JUNIOR YEAR – SPRING

AE 290 Aerospace Colloquium .....	.25
AE 421 Computer Graphics	4.0
AE 508 Aerospace Structures II.....	3.0
AE 551 Dynamics of Flight II.....	4.0
AE 572 Fundamentals of Jet Propulsion	3.0
EECS 316 Circuits, Electronics & Instrumentation	3.0
EECS 318 Circuits & Electronics Laboratory	1.0
TOTAL HOURS.....	18.25

SENIOR YEAR – FALL

AE 290 Aerospace Colloquium .....	.25
AE 510 Aerospace Material & Processes	4.0
AE 521 Aerospace Systems Design I	4.0
AE 590 Aerospace Seminar	1.0
Technical elective**	3.0
KU Core Elective*	3.0
TOTAL HOURS.....	15.25

SENIOR YEAR – SPRING

AE 290 Aerospace Colloquium .....	.25
AE 430 Aerospace Instrumentation	3.0
AE 522 Aircraft Systems Design, or ...	
AE 523 Spacecraft Systems Design, or ...	
AE 524 Propulsion Systems Design.....	4.0
Technical electives**	6.0
KU Core Elective*	3.0
TOTAL HOURS.....	16.25

* Students must ensure the electives they choose fulfill all remaining KU Core requirements. At least one course in humanities, at least one course in social science, including ECON 104, 142 or 144, and at least two courses from one department, totaling 12 hours. Up to six hours of undesignated foreign language credit may be applied to the humanities requirement.

** Technical electives are selected from upper level aerospace courses, approved courses from other engineering departments or approved math courses.



ARCHITECTURAL ENGINEERING

WHAT DO THEY DO?

Architectural engineering focuses on engineered building systems, which include structural systems: i.e. design of the building exterior; heating, ventilation, and air conditioning systems; lighting and power systems; as well as in the efficient energy utilization and construction methods of buildings. These engineers center their attention on the safety, comfort, cost, and construction methods of the built environment.

WHERE DO THEY WORK?

- Engineering consulting firms
- Construction companies
- Environmental companies
- Design agencies
- Government agencies

WHAT ARE THEY PAID?

Bachelor's degree candidates

Recent KU graduate starting salary range: \$48,000 - \$67,800

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU ARCHITECTURAL ENGINEERS

Atlantic Design Group	ARCO National
Black & Veatch	Bartlett & West Engineers
Burns & McDonnell	Cannon Design
CRB Consulting	Design Collaborative
DLR Group	DWG Consulting Engr.
Engineered Air	Environmental Systems Design
Fluor Corp.	Garney Construction
GBA	GE Lighting
Glumac	Henderson Engrs. Inc.
HNTB	Jacobs
J.E. Dunn	JEI Structural Engineering
Kiewit	McCown Gordon
M.E. Group	Paric Corp.
PBK	Pella Corp.
Ross & Baruzzini	Thornton Tomasetti
TK Architects	Turner Construction Co.
Wallace Engineering	Whiting-Turner
Wilson & Co.	WSP

TAKE ACTION

Tour the KU campus and apply early to the School of Engineering

www.ceae.engr.ku.edu

www.engr.ku.edu

785-864-3881

studyengineering@ku.edu

ARCHITECTURAL ENGINEERING CURRICULUM

128 credit hours required for graduation

FRESHMAN YEAR – FALL		HOURS
ARCE 101	Intro. to Architectural Engineering	2
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
	Basic Science Elective*	1
TOTAL HOURS.....		16

FRESHMAN YEAR – SPRING		HOURS
ARCE 217	Computer Assisted Building Design	3
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I.....	1
	Social Science Elective**	3
TOTAL HOURS.....		18

SOPHOMORE YEAR – FALL		HOURS
CE 301	Statics and Dynamics	5
ME 312	Basic Engineering Thermodynamics	3
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra	2
PHSX 212	General Physics II	3
PHSX 236	General Physics II lab	1
TOTAL HOURS.....		17

SOPHOMORE YEAR – SPRING		HOURS
ARCE 350	Building Materials Science	3
CE 310	Strength of Materials	4
CMGT 357	Engineering Economics	3
MATH 526	Applied Mathematical Statistics	3
ME 510	Fluid Mechanics	3
TOTAL HOURS.....		16

JUNIOR YEAR – FALL		HOURS
ARCH 626	Building Tech: Const. Sys. & Assemb.	3
ARCE 660	Building Thermal Science	3
CE 461	Structural Analysis	4
EECS 315	Electric Circuits & Machines	3
	Ethics/Social Responsibility Elective * and **	3
TOTAL HOURS.....		16

JUNIOR YEAR – SPRING		HOURS
ARCE 650	Illumination Engineering I	3
ARCE 661	HVAC&R Systems Design	3
ARCH 540	Global History of Arch. I	3
CE 562	Design of Steel Structures	3
CMGT 500	Construction Engineering	3
TOTAL HOURS.....		15

SENIOR YEAR – FALL		HOURS
CE 563	Design of Reinf. Concrete Structures	3
ARCE 640	Power Systems Engineering I	3
ARCH 541	Global History of Architecture II	3
ARCH	Architectural Design Studio*	6
TOTAL HOURS.....		15

SENIOR YEAR – SPRING		HOURS
ARCE 698	ARCE Comprehensive Design Project	3
COMS 130	Speaker-Audience Communication	3
	Architectural Studio, or Engineering Elective*	3
	Human Diversity Elective**	3
	Global Awareness Elective**	3
TOTAL HOURS.....		15

Students are required to take the Fundamentals of Engineering (FE) Exam prior to graduation.

* Refer to the Bachelor of Science in Architectural Engineering elective list, available at www.ceae.ku.edu/undergraduate/curriculum.html.

** Students must ensure the electives they choose fulfill all remaining KU Core requirements. Refer to the lists of acceptable General Education and Advanced Education KU Core courses via kucore.ku.edu. Students must complete 128 hours to earn the degree. After meeting all curricular requirements students may fill remaining credit hour requirements with general electives.



CHEMICAL ENGINEERING

WHAT DO THEY DO?

Chemical engineers are concerned with the chemical processes that turn raw materials into valuable products. They design processes where materials undergo a chemical or physical change. Chemical engineers build a bridge between science and manufacturing, applying the principles of chemistry, physics, math, biology and engineering to solve problems involving the production or use of chemicals.

WHERE DO THEY WORK?

- Manufacturing companies
- Environmental companies
- Health-care and pharmaceutical firms
- Petroleum industry
- Biotechnology
- Consulting firms

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$52,800 - \$78,900

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU CHEMICAL ENGINEERS

Bayer Crop Science	Black & Veatch
Boeing	Boehringer Ingelheim Vetmedica
Burns & McDonnell	Bryan Res. & Engineering
Cargill	Catalent Pharma Solutions
Chesapeake Energy	Chevron Phillips
ConocoPhillips	CRB Consulting Engrs.
CCP Composites	CVR Energy
DuPont	ExxonMobil
Goodyear Tire & Rubber	Halliburton
Hills Pet Nutrition	HollyFrontier Co.
Honeywell	Hospira Pharmaceuticals
Huhtamaki	ICL Performance Products
Jacobs Engineering	Kinder Morgan
Koch Industries	Louis Dreyfus Commodities
MGP Ingredients	Morton Salt
MRI Global	Occidental Petroleum
ONEOK	Orbis Bioscience
Peace Corps	PepsiCo/Frito-Lay
QSpec Solutions	Schlumberger
Trinity Consultants	URS Corp.

TAKE ACTION

Tour KU and apply to the School of Engineering

www.cpe.egr.ku.edu

www.egr.ku.edu

785-864-3881

studyengineering@ku.edu

CHEMICAL ENGINEERING CURRICULUM

FRESHMAN YEAR – FALL		HOURS
C&PE 111	Introduction to the Profession	2
CHEM 170	Chemistry for the Chemical Sciences I	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
TOTAL HOURS		15
FRESHMAN YEAR – SPRING		
C&PE 121	Intro. to Computers in Engineering	3
CHEM 175	Chemistry for the Chemical Sciences II	5
ENGL 102	Composition & Literature.....	3
MATH 122	Calculus II	5
TOTAL HOURS		16
SOPHOMORE YEAR – FALL		
C&PE 211	Material & Energy Balances	3
CHEM 330	Organic Chemistry I	3
CHEM 331	Organic Chemistry I Lab	2
MATH 220	Applied Differential Equations*	3
MATH 290	Elementary Linear Algebra	2
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory.....	1
TOTAL HOURS		17
SOPHOMORE YEAR – SPRING		
C&PE 221	Chemical Engineering Thermodynamics I	3
PHSX 212	General Physics II	3
PHSX 236	General Physics II Laboratory.....	1
	Advanced Chemistry Elective	3
	KU Core Elective**	3
	Engineering Elective***	3
TOTAL HOURS		16
JUNIOR YEAR – FALL		
C&PE 511	Momentum Transfer	3
C&PE 512	Chemical Engineering Thermodynamics II	3
C&PE 522	Economic Appraisal of C&PE Projects	2
CHEM 530	Physical Chemistry I	3
	MSEHS Elective*	3
	Engineering Elective***	3
TOTAL HOURS.....		17
JUNIOR YEAR – SPRING		
C&PE 521	Heat Transfer	3
C&PE 523	Mass Transfer	4
C&PE 524	Chemical Engineering Kinetics & Reactor Design	3
CHEM 535	Physical Chemistry II	4
	KU Core Elective**	3
TOTAL HOURS		17
SENIOR YEAR – FALL		
C&PE 613	Chemical Engineering Design I	4
C&PE 615	Introduction to Process Dynamics and Control	3
C&PE 616	Chemical Engineering Laboratory I	3
	Engineering Elective***	3
	KU Core Elective**	3
TOTAL HOURS		16
SENIOR YEAR – SPRING		
C&PE 623	Chemical Engineering Design II	2
C&PE 624	Plant & Environmental Safety	3
C&PE 626	Chemical Engineering Laboratory II	3
	Engineering Elective***	3
	KU Core Elective **	3
TOTAL HOURS		14

* Students that select both MATH 223 AND MATH 320 instead of MATH 220 do NOT require the additional math, science, engineering, humanities or social sciences (MSEHS) elective.

** Students must ensure these electives collectively must meet all remaining KU Core requirements for Breadth of Knowledge and Culture and Diversity.

*** Refer to the Chemical Engineering Handbook, available at <http://www.cpe.engr.ku.edu/students/handbook.pdf>.

CHEMICAL ENGINEERING CONCENTRATION CURRICULA

The Department of Chemical & Petroleum Engineering has established several curricula that allow students to pursue a more specialized course of study and still meet graduation criteria. Students take the courses outlined on the previous page with the following substitutions:

BIOMEDICAL CONCENTRATION

Advanced Chemistry — BIOL 600, Introductory Biochemistry
Basic Sciences — includes BIOL 150, Prin. of Molecular & Cellular Biology; and BIOL 646, Mammalian Physiology; or BIOL 246 Principles of Human Physiology.
Engineering Science/Design Electives — includes C&PE 656, Introduction to Biomedical Engineering.

ENVIRONMENTAL CONCENTRATION

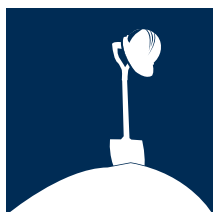
Engineering electives — CE 477, Introduction to Environmental Engineering and three upper level Civil Engineering courses as specified in the Chemical Engineering Handbook, available at <http://www.cpe.engr.ku.edu/students/handbook.pdf>.

PREMEDICAL CONCENTRATION

Advanced Chemistry — includes CHEM 335, Organic Chemistry II; and CHEM 336, Organic Chemistry II Laboratory.
Biological Science — BIOL 150, Principles of Molecular and Cellular Biology; and BIOL 152, Principles of Organismal Biology; plus 12 additional hours of biology are recommended.

PETROLEUM CONCENTRATION

Advanced Chemistry — includes GEOL 101 and GEOL 103
Engineering Science/Design Electives — includes C&PE 327, Reservoir Engineering I; and C&PE 527, Reservoir Engineering II; and a three-hour petroleum engineering elective.



CIVIL ENGINEERING

WHAT DO THEY DO?

Civil engineers plan, design, construct and oversee public and private infrastructure systems as well as maintain essential structures such as highways, bridges, buildings, dams and water and wastewater systems.

WHERE DO THEY WORK?

- Engineering consulting firms
- Construction industry
- Oil companies
- City, state and federal government
- Manufacturing companies
- Major industrial and commercial centers
- State transportation departments

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$49,700 - \$73,500

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU CIVIL ENGINEERS:

Affinis Corp.	Bartlett & West
Black & Veatch	BlueScope Buildings
Boeing Co.	Burns & McDonnell
CECO Concrete	Design Data
ExxonMobil	Garney
GBA	Halliburton
HDR Engineering	HNTB Corp.
Jacobs Engineering	J.E. Dunn
Kiewit	KS Dept. of Transportation
McCown Gordon	Peace Corps
SCS Aquaterra	Sega
Shive-Hattery	SPX Cooling Tech
Terracon Consultants	Thornton Tomasetti
Trinity Consultants	Turner Construction
Union Pacific Railway	U.S. Army Corps of Engineers
Wallace Engineering	Weitz Co.
Westar Energy	Whiting-Turner Const.
Wilson & Co.	Wolf Creek Nuclear

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CURRICULUM NOTES

Students in the Department of Civil, Environmental and Architectural Engineering are required to take the Fundamentals of Engineering Exam prior to graduation.

DUAL DEGREE WITH BUSINESS

A student may pursue a civil engineering degree and a business degree in a five-year, dual-degree program. Students must complete degree requirements for the Civil Engineering program as well as for the School of Business degree program. Careful planning is important. Please consult an adviser.

CIVIL ENGINEERING CURRICULUM

132 credit hours required for graduation

FRESHMAN YEAR – FALL		HOURS
CE 191	Introduction to Civil Engineering Profession*	2
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I	5
TOTAL HOURS		15
FRESHMAN YEAR – SPRING		
CE 192	Civil Engineering Graphics	3
ENGL 102	Critical Reading & Writing	3
MATH 122	Calculus II	5
PHSX 210	General Physics I	3
PHSX 216	General Physics I Laboratory	1
	KU Core Elective **	3
TOTAL HOURS		18
SOPHOMORE YEAR – FALL		
CE 301	Statics & Dynamics	5
COMS 130	Speaker-Audience Communication	3
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra	2
PHSX 212	General Physics II	3
PHSX 236	General Physics II Laboratory	1
TOTAL HOURS		17
SOPHOMORE YEAR – SPRING		
CE 240	Surveying	3
CE 310	Strength of Materials	4
ECON 104	Introductory Economics, or ...	
ECON 142	Principles of Microeconomics, or ...	
ECON 144	Principles of Macroeconomics	3-4
EECS 137	Visual Basic for Engineers	3
	Basic Science Elective***	3
TOTAL HOURS		16-17
JUNIOR YEAR – FALL		
CE 330	Fluid Mechanics	4
CE 461	Structural Analysis	4
CE 412	Structural Engineering Materials, or	
CE 484	Material for Transportation Facilities	3
MATH 526	Applied Mathematical Statistics	3
	KU Core Elective **	3
TOTAL HOURS		17
JUNIOR YEAR – SPRING		
CE 455	Hydrology	3
CE 477	Introduction to Environmental Engineering	3
CE 480	Transportation Engineering	3
CE 487	Soil Mechanics	4
	Engineering Science Elective	3
TOTAL HOURS		16
SENIOR YEAR – FALL		
CE 552	Water Resources Engineering Design or ...	
CE 576	Municipal Waste Sply. and Wastewater Trtmnt	4
CE 562 or 563	Structural Design Elective	3
CMGT 357	Engineering Economics	3
	Civil Engineering Design Elective	3
	Engineering Science Elective***	3
TOTAL HOURS		16
SENIOR YEAR – SPRING		
CE 562 or 563	Structural Design Elective	3
	Civil Engineering Design Elective	3
	KU Core Electives **	6
	General Electives	4-5†
TOTAL HOURS		16-17

See page 15 for additional important curriculum notes.

* Recommended but not required.

** Students must ensure the electives they choose fulfill all remaining KU Core requirements. Refer to the KU Core list of approved courses, kucore.ku.edu/courses.

*** GEOL 101, 105, 351, 551; Physics elective; Chemistry elective.

**** Students must take two of the following engineering science courses: EECS 315, Circuits; ME 312, Thermodynamics; ME 306, Science of Materials; or ARCE 350, Building Materials Science.

† Students must complete 132 hours to earn the degree. After meeting all curricular requirements students may fill remaining credit hour requirements with general electives.

CIVIL - ENVIRONMENTAL CONC.

132 credit hours required for graduation

FRESHMAN YEAR – FALL		HOURS
CE 191	Introduction to Civil Engineering Profession*	2
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I	5
TOTAL HOURS		15
FRESHMAN YEAR – SPRING		
CE 192	Civil Engineering Graphics	3
ENGL 102	Critical Reading & Writing	3
MATH 122	Calculus II	5
PHSX 210	General Physics I	3
PHSX 216	General Physics I Laboratory	1
	KU Core Elective **	3
TOTAL HOURS		18
SOPHOMORE YEAR – FALL		
CE 301	Statics & Dynamics	5
COMS 130	Speaker-Audience Communication	3
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra	2
PHSX 212	General Physics II	3
PHSX 236	General Physics II Laboratory	1
TOTAL HOURS		17
SOPHOMORE YEAR – SPRING		
CE 240	Surveying	3
CE 310	Strength of Materials	4
ECON 104	Introductory Economics, or ...	
ECON 142	Principles of Microeconomics, or ...	
ECON 144	Principles of Macroeconomics	3-4
EECS 137	Visual Basic for Engineers	3
	Basic Science Elective***	3
TOTAL HOURS		16-17
JUNIOR YEAR – FALL		
CE 330	Fluid Mechanics	4
CE 461	Structural Analysis	4
CE 412	Structural Engineering Materials, or	
CE 484	Material for Transportation Facilities	3
MATH 526	Applied Mathematical Statistics	3
	KU Core Elective **	3
TOTAL HOURS		17
JUNIOR YEAR – SPRING		
CE 455	Hydrology	3
CE 477	Introduction to Environmental Engineering	3
CE 487	Soil Mechanics	4
CE 562 or 563	Structural Design Elective	3
	Engineering Science Elective***	3
TOTAL HOURS		16
SENIOR YEAR – FALL		
CE 552	Water Resources Engineering Design	4
CE 570	Concepts of Environmental Chemistry, or ...	
CE 571	Environmental Chemical Analysis, or ...	
CE 573	Biological Principles of Environ. Engineering	3
CMGT 357	Engineering Economics	3
	Engineering Science Elective***	3
	General Elective	3-4†
TOTAL HOURS		16-17
SENIOR YEAR – SPRING		
CE 574	Design of Air Pollution Control Systems, or ...	
CE 755	Free Surface Flow I, or ...	
CE 757	Pipe Flow Systems	3
CE 576	Muni. Waste Sply. and Wastewater Trtmnt.	4
CE 582	Highway Engineering, or ...	
CE 588	Foundation Engineering, or ...	
CMGT 500	Construction Engineering	3
	KU Core Electives **	6
TOTAL HOURS		16

See page 15 for additional important curriculum notes.

* Recommended but not required.

** Students must ensure the electives they choose fulfill all remaining KU Core requirements. Refer to the KU Core list of approved courses, kucore.ku.edu/courses.

*** ATMO 105, 521; BIOL 104, 400, 414, 660; CHEM 622, 646; GEOG 358, 521; GEOL 101, 302, 351, 551.

**** Students must take two of the following engineering science courses: EECS 315, Circuits; ME 312, Thermodynamics; ME 306, Sci. of Materials; or ARCE 350, Building Materials Science.

† Students must complete 132 hours to earn the degree. After meeting all curricular requirements students may fill remaining credit hour requirements with general electives.



COMPUTER ENGINEERING

WHAT DO THEY DO?

Computer engineers focus on all aspects of computational devices and systems, including hardware and software. Here are some examples: notebook computers (Vaio), mp3 players (iPod), embedded systems (anti-lock brakes), video game consoles (Wii), robotics (Segway), computer-generated imagery (Pixar), virtual reality (Flight Simulator), integrated circuits (“Intel Inside”) and computer networking (Internet).

WHERE DO THEY WORK?

- Computer industry
- Telecommunications
- Consulting firms
- Software companies
- Government/defense

WHAT ARE THEY PAID?

Bachelor’s degree candidates

National average starting salary range: \$52,200 - \$78,000

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU COMPUTER ENGINEERS

Accenture	Aeroflex
Alcatel - Lucent	Altec Industries
Arris	Assurant
BNSF Railway	Boeing Co.
Cerner	Cessna Aircraft
EMC	EN Engineering
Epic	Ericsson
Federal Reserve Bank	Gallup
Garmin	Google
Hartfiel Automation	Herzog
Honeywell	IBM
JT3	Laird Technologies
LI-COR Biosciences	Microsoft
Milbank Manufacturing	MRI Global
ON Semiconductor	Perceptive Software
Propylon	Relm Wireless
Southwest Research Institute	
Tradebot Systems	Sprint
Tinker Air Force Base	Union Pacific Railroad
U.S. Armed Forces	Valent Aerostructures

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COMPUTER ENGINEERING CURRICULUM

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or ...	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
ECON 142	Principles of Microeconomics, or ...	
ECON 144	Principles of Macroeconomics	3
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or ...	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PSHX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
EECS 210	Discrete Structures	4
EECS 211	Circuits I.....	3
EECS 268	Programming II	4
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
TOTAL HOURS.....		16
SOPHOMORE YEAR – SPRING		
COMS 130	Speaker-Audience Communication	3
EECS 212	Circuits II	4
EECS 220	Electromagnetics I.....	4
EECS 368	Programming Language Paradigms	3
	KU Core Elective *.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – FALL		
EECS 312	Electronic Circuits I.....	3
EECS 388	Computer Systems & Assembly Language.....	4
EECS 448	Software Engineering I.....	4
	Add'l KU Core Arts/Human./SocSci Elective*	3
TOTAL HOURS.....		14
JUNIOR YEAR – SPRING		
EECS 360	Signal & System Analysis	4
EECS 443	Digital Systems Design.....	4
EECS 461	Probability and Statistics.....	3
	KU Core Elective **.....	3
	Professional Elective**.....	3
TOTAL HOURS.....		17
SENIOR YEAR – FALL		
EECS 541	Computer Systems Design Laboratory I.....	3
EECS 563	Introduction to Communication Networks	3
EECS 643	Advanced Computer Organization.....	3
EECS	Senior Elective #1***	3
PHSX 313	General Physics III.....	3
PSHX 316	General Physics III Lab.....	1
TOTAL HOURS.....		16
SENIOR YEAR – SPRING		
EECS 542	Computer Systems Design Laboratory II.....	3
EECS 678	Introduction to Operating Systems	4
EECS	Senior Elective #2***	3
EECS	Senior Elective #3***	3
	KU Core Elective *.....	3
TOTAL HOURS.....		16

* Students must ensure the electives they choose fulfill all remaining KU Core requirements. Additional electives from the KU Core list are required for graduation.

** Professional Electives are chosen from a list of engineering, natural science, math, or business courses identified in the EECS department handbook.

*** Nine hours of senior electives are chosen from EECS courses at 400 level or above, excluding EECS 498, 692 and 645. See student handbook for details.



COMPUTER SCIENCE

WHAT DO THEY DO?

Computer scientists focus on the theory and practice of computing. Examples include expert systems (medical diagnostics), social networking (Facebook), online merchandising (eBay), search engines (Google), business and personal software (MS Office), geographic mapping tools (Google Earth), video games (Guitar Hero), video sharing (YouTube), artificial intelligence (Watson), and Web-based collaboration (Wikipedia).

WHERE DO THEY WORK?

- Software companies
- Consulting firms
- Telecommunications
- Computer systems analysis
- Government/defense

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$51,100 - \$76,900

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU COMPUTER SCIENTISTS

Adknowledge	Amazon.com
AMD	Arris
BillSoft	Blue Cross Blue Shield
Boeing	CAL Testing
Caterpillar	Cerner
Commerce Bank	Data Systems Int'l
Deloitte Consulting	Design Data
Epic	Ericsson
Federal Reserve Bank	Gallup
Garmin	Google
Hewlett-Packard Co.	Honeywell
H&R Block	IBM
iModules Software Inc.	Intouch Solutions
Microsoft	MRI Global
Nat'l Weather Service	NIC Inc.
Perceptive Software	Professional Research Consultants
Propylon	RCI Safety
Southwest Res. Inst.	Sprint
Sporting Innovations	Tradebot Systems
Verizon Wireless	Westar Energy

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COMPUTER SCIENCE CURRICULUM

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
	KU Core Elective *.....	3
TOTAL HOURS.....		16

FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory.....	1
TOTAL HOURS.....		16

SOPHOMORE YEAR – FALL		
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II.....	3
PHSX 236	General Physics II Laboratory.....	1
	KU Core Elective *.....	3
TOTAL HOURS.....		17

SOPHOMORE YEAR – SPRING		
EECS 368	Programming Language Paradigms	3
EECS 388	Computer Systems & Assembly Language.....	4
MATH 223	Vector Calculus	3
	Add'l KU Core Arts & Humanities Elective *.....	3
	Science Elective**.....	3
TOTAL HOURS.....		16

JUNIOR YEAR – FALL		
COMS 130	Speaker-Audience Communication.....	3
EECS 448	Software Engineering I.....	4
EECS 510	Introduction to the Theory of Computing.....	3
EECS 645	Computer Architecture.....	3
	Add'l KU Core Social Science Elective *.....	3
TOTAL HOURS.....		16

JUNIOR YEAR – SPRING		
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
MATH 526	Applied Mathematical Statistics I.....	3
	KU Core Elective *.....	3
	Professional Elective***.....	3
TOTAL HOURS.....		17

SENIOR YEAR – FALL		
EECS 581	Computer Science Design I	3
EECS 662	Programming Languages	3
EECS 665	Compiler Construction.....	4
EECS	Senior Elective #1****.....	3
EECS	Senior Elective #2****.....	3
TOTAL HOURS.....		16

SENIOR YEAR – SPRING		
EECS 582	Computer Science Design II	3
EECS 660	Fundamentals of Computer Algorithms.....	3
EECS	Senior Elective #3****.....	3
EECS	Senior Elective #4****.....	3
	KU Core Elective *.....	3
TOTAL HOURS.....		15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements. Additional electives from the KU Core list are required for graduation.

** Science Electives are chosen from ASTR 391, BIOL 150, BIOL 152, CHEM 130, CHEM 135, CHEM 150, GEOG 104 and GEOG 105, GEOG 304, or GEOL 101.

*** A Professional Elective is chosen from a list of engineering, natural science, math, or business courses identified in the EECS Department Handbook.

**** Senior Electives are EECS 563, EECS 638, EECS 647, EECS 648, EECS 649, EECS 672, EECS 690 and any EECS course 700 level or above.



ELECTRICAL ENGINEERING

WHAT DO THEY DO?

Electrical engineers work with a broad range of electrical and electronic devices and systems. Examples include mobile communication, solar energy (solar panels), hybrid electric cars (Prius), wireless communications (Bluetooth), satellite systems (GPS), medical diagnostics tools (ultrasound), photonics (endoscopy), digital video (HDTV), bio-electronics (pacemakers), and radar (Doppler weather radar).

WHERE DO THEY WORK?

- Public utilities firms
- Consulting firms
- Telecommunications
- Consumer electronics
- Government/defense

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$49,900 - \$75,100

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU ELECTRICAL ENGINEERS

Aeroflex	Arris
B/E Aerospace	Baldwin Filters
Bayer CropScience	Black & Veatch
Boehringer Ingelheim Vetmedica	
Bombardier/Learjet	Burns & McDonnell
Cessna Aircraft	Chevron Phillips
Daimler Trucks	Dashiell Corp.
Del Monte	Ericsson
ExxonMobil	Garmin
General Motors	Goodyear
Grundfos	Halliburton Energy
Hartfiel Automation	Honda R&D Americas Inc.
Honeywell	Hospira Pharmaceuticals
Jacobs	Johnson Controls
KCP& L	Kiewit
Mass Electric	ON Semiconductor
Rehrig Pacific	Southwest Research Institute
Sprint	Sunflower Electric Power Corp.
Tinker Air Force Base	Union Pacific Railway
U.S.Armed Forces	Verizon Wireless
Westar Energy	WireCo WorldGroup
Wolf Creek Nuclear	WSP Group

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ELECTRICAL ENGINEERING CURRICULUM

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
ECON 142	Principles of Microeconomics, or ...	
ECON 144	Principles of Macroeconomics	3
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PSHX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
CHEM 150	Chemistry for Engineers, or	
CHEM 130	Foundations of Chemistry I	5
EECS 211	Circuits I.....	3
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
	KU Core Elective *.....	3
TOTAL HOURS.....		16
SOPHOMORE YEAR – SPRING		
EECS 212	Circuits II	4
EECS 220	Electromagnetics I.....	4
EECS 388	Computer Systems & Assembly Language.....	4
	Add'l KU Core Arts/Human./SocSci Elective *	3
TOTAL HOURS.....		15
JUNIOR YEAR – FALL		
COMS 130	Speaker-Audience Communication.....	3
EECS 312	Electronic Circuits I.....	3
EECS 360	Signal & System Analysis	4
PHSX 313	General Physics III.....	3
PSHX 316	Intermediate Physics Lab	1
	KU Core Elective *.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – SPRING		
EECS 412	Electronic Circuits II.....	4
EECS 444	Control Systems.....	3
EECS 461	Probability and Statistics.....	3
EECS 562	Introduction to Communication Systems	4
	Professional Elective 1**.....	3
TOTAL HOURS.....		17
SENIOR YEAR – FALL		
EECS 420	Electromagnetics II.....	4
EECS 470	Electronic Devices & Properties of Materials.....	3
EECS 501	Senior Design Laboratory.....	3
EECS	Senior Elective #1***	3
	Professional Elective 2**.....	3
TOTAL HOURS.....		16
SENIOR YEAR – SPRING		
EECS 443	Digital Systems Design.....	4
EECS 502	Senior Design Laboratory II.....	3
EECS	Senior Elective #2***	3
EECS	Senior Elective #3***	3
	KU Core Elective *.....	3
TOTAL HOURS.....		16

* Students must ensure the electives they choose fulfill all remaining KU Core requirements. Additional electives from the KU Core list are required for graduation.

** Six hours of Professional Electives are chosen from a list of engineering, natural science, math, or business courses identified in the EECS Department handbook.

*** Nine hours of senior electives are chosen from EECS courses at 400 level or above, excluding EECS 498 and 692. See student handbook for details.



ENGINEERING PHYSICS

WHAT DO THEY DO?

Engineering physics students combine an extensive background in physics – the science that underlies modern technology – with an engineering degree. Their broad training and technical breadth provide a unique flexibility. They have the science background to pursue pure research opportunities, the engineering degree and design concentration to solve practical problems in industry or a wide variety of other settings, as well as the understanding to act as a communication link between highly diversified divisions within an organization. The KU engineering physics program is jointly administered by the Department of Physics and Astronomy in the College of Liberal Arts & Sciences and the KU School of Engineering. KU engineering physics students specialize in one of four design concentrations:

Aerospace Systems	Digital Electronic Systems
Chemical Systems	Electromechanical Control Systems

WHERE DO THEY WORK?

- Aerospace & avionics
- Electronics industry
- Telecommunications
- Research & development labs
- Defense contractors
- Design & consulting firms
- Government agencies

GRADUATE SCHOOL?

KU Engineering Physics graduates are well positioned to pursue advanced degrees. Turn to page 4 to see where KU School of Engineering students continue their education.

WHAT ARE THEY PAID?

Bachelor's degree candidates

Recent KU graduate starting salary range: \$53,700 - \$62,000

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU ENGINEERING PHYSICS STUDENTS

Armstrong	AT&T
Baldwin Filters	B/E Aerospace
Boeing Co.	Bombardier/Learjet
CymSTAR	Deloitte Consulting
Diodes Inc.	Epic
Ericsson	FAA
Gallup	Garmin
Grundfos	Halliburton Energy
Honda R&D	Huhtamaki
Johns Hopkins University Applied Physics Lab	
Johnson Controls	Koch Industries
Laird Technologies	Microsoft
National Indemnity Co.	Nestle Purina
NetApp	Peace Corps
Schlumberger	Southwest Research Institute
Tinker Air Force Base	Twentyseven Global
U.S. Dept. of State	Universal Industries

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ENGINEERING PHYSICS - AEROSPACE SYSTEMS DESIGN CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
AE 245	Introduction to Aerospace Engineering	3
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
PHSX 150	Seminar in Phys., Astr., & Engineering Physics .....	.5
TOTAL HOURS.....		16.5
FRESHMAN YEAR – SPRING		
EECS 138	Introduction to Computing	3
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 211	General Physics I, and	4
PHSX 216	General Physics I Laboratory	1
-or-		
PHSX 213	General Physics I Honors.....	5
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
AE 345	Fluid Mechanics	3
CE 301	Statics & Dynamics	5
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II, and	3
PHSX 236	General Physics II Laboratory	1
-or-		
PHSX 214	General Physics II Honors	4
TOTAL HOURS.....		17
SOPHOMORE YEAR – SPRING		
AE 445	Aircraft Aerodynamics	3
ME 312	Basic Engineering Thermodynamics	3
CE 310	Strength of Materials.....	4
MATH 220	Applied Differential Equations, or ...	
MATH 320	Elementary Differential Equations	3
PHSX 313	General Physics III.....	3
PHSX 316	Intermediate Physics Lab.....	1
TOTAL HOURS.....		17
JUNIOR YEAR – FALL		
AE 507	Aerospace Structures I.....	3
AE 545	Fundamentals of Aerodynamics	5
AE 550	Dynamics of Flight I.....	3
EPHX 521	Mechanics I.....	3
	KU Core Elective*.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – SPRING		
AE 421	Computer Graphics	4
AE 551	Dynamics of Flight II.....	4
AE 572	Fundamentals of Jet Propulsion	3
EPHX 536	Electronic Circuit Measurement & Design (s), or ...	
AE 508	Aerospace Structures II (a)	3-4
TOTAL HOURS.....		14-15
SENIOR YEAR – FALL		
AE 521	Aerospace Systems Design I (a), or ...	
AE 560	Spacecraft Systems (s).....	3-4
EPHX 516	Physical Measurements	4
EPHX 531	Electricity & Magnetism	3
	KU Core Electives*	6
TOTAL HOURS.....		16-17
SENIOR YEAR – SPRING		
EPHX 536	Electronic Circuit Measurement & Design (a), or ...	
AE 523	Space Systems Design, (s).....	4
EPHX 601	Design of Physical & Electronic Systems.....	4
	KU Core Electives*	6
TOTAL HOURS.....		14

(a) Aircraft track

(s) Spacecraft track

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

ENGINEERING PHYSICS - CHEMICAL SYSTEMS CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
CHEM 170	Chemistry for Chemical Sciences	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
PHSX 150	Seminar in Phys., Astr., & Engineering Physics .....	.5
	KU Core Electives*	3
	TOTAL HOURS.....	16.5
FRESHMAN YEAR – SPRING		
CHEM 175	Chemistry for Chemical Sciences II.....	5
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 211	General Physics I, and	4
PHSX 216	General Physics I Laboratory	1
-or-		
PHSX 213	General Physics I Honors.....	5
	TOTAL HOURS.....	18
SOPHOMORE YEAR – FALL		
C&PE 121	Introduction to Computers in Engineering.....	3
C&PE 211	Material & Energy Balances.....	3
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II, and	3
PHSX 236	General Physics II Laboratory	1
-or-		
PHSX 214	General Physics II Honors	4
	TOTAL HOURS.....	15
SOPHOMORE YEAR – SPRING		
CHEM 330	Organic Chemistry I.....	3
C&PE 221	Chemical Engineering Thermodynamics I.....	3
MATH 220	Applied Differential Equations, or ...	
MATH 320	Elementary Differential Equations	3
PHSX 313	General Physics III.....	3
PHSX 316	Intermediate Physics Lab.....	1
	KU Core Electives*	3
	TOTAL HOURS.....	16
JUNIOR YEAR – FALL		
CHEM 530	Introduction to Physical Chemistry	3
C&PE 511	Momentum Transfer	3
C&PE 512	Process Engineering Thermodynamics II.....	3
C&PE 522	Economic Appraisal of C&PE Projects	2
EPHX 521	Mechanics I.....	3
	TOTAL HOURS.....	14
JUNIOR YEAR – SPRING		
C&PE 521	Heat Transfer.....	3
C&PE 523	Mass Transfer	4
C&PE 524	Kinetics & Reactor Design.....	3
EPHX 536	Electronic Circuit Measurement & Design.....	4
	KU Core Electives*	3
	TOTAL HOURS.....	17
SENIOR YEAR – FALL		
C&PE 613	Chemical Engineering Design I.....	4
C&PE 615	Introduction to Process Dynamics & Control	3
C&PE 616	Chemical Engineering Lab I.....	3
EPHX 516	Physical Measurements	4
EPHX 531	Electricity & Magnetism.....	3
	TOTAL HOURS.....	17
SENIOR YEAR – SPRING		
C&PE 623	Chemical Engineering Design II	2
EPHX 511	Introductory Quantum Mechanics.....	3
EPHX 601	Design of Physical and Electronic Systems.....	4
	KU Core Electives*	6
	TOTAL HOURS.....	15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

ENGINEERING PHYSICS - DIGITAL ELECTRONIC SYSTEMS CONC.

FRESHMAN YEAR – FALL		HOURS
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
PHSX 150	Seminar in Phys., Astr., & Engineering Physics .....	.5
	KU Core Elective*.....	3
TOTAL HOURS.....		16.5

FRESHMAN YEAR – SPRING		HOURS
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing	3
MATH 122	Calculus II	5
PHSX 211	General Physics I, and	4
PHSX 216	General Physics I Laboratory	1
-or-		
PHSX 213	General Physics I Honors.....	5
TOTAL HOURS.....		17

SOPHOMORE YEAR – FALL		HOURS
EECS 211	Circuits I.....	3
EECS 140	Introduction to Digital Logic Design	4
MATH 220	Applied Differential Equations, or ...	
MATH 320	Elementary Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II, and	3
PHSX 236	General Physics II Laboratory	1
-or-		
PHSX 214	General Physics II Honors	4
TOTAL HOURS.....		16

SOPHOMORE YEAR – SPRING		HOURS
EECS 212	Circuits II	4
EECS 268	Programming II	4
MATH 223	Vector Calculus	3
PHSX 313	General Physics III.....	3
PHSX 316	Intermediate Physics Lab.....	1
TOTAL HOURS.....		15

JUNIOR YEAR – FALL		HOURS
EECS 312	Electronic Circuits I.....	3
EECS 360	Signal & System Analysis	4
EECS 388	Computer Systems & Assembly Language.....	4
EPHX 521	Mechanics I	3
	KU Core Elective*.....	3
TOTAL HOURS.....		17

JUNIOR YEAR – SPRING		HOURS
EECS 443	Digital Systems Design.....	4
EECS 448	Software Engineering I.....	4
EECS 461	Probability & Statistics	3
EPHX 511	Introductory Quantum Mechanics.....	3
	KU Core Elective*	3
TOTAL HOURS.....		17

SENIOR YEAR – FALL		HOURS
EECS 470	Electronic Devices & Properties of Materials.....	3
EECS 541	Computer Systems Design Lab I.....	3
	EECS Elective**	3
EPHX 516	Physical Measurements	4
EPHX 531	Electricity & Magnetism	3
TOTAL HOURS.....		16

SENIOR YEAR – SPRING		HOURS
EECS 542	Computer Systems Design Lab II.....	3
EECS 645	Computer Architecture.....	3
EPHX 601	Design of Physical and Electronic Systems.....	4
	KU Core Elective*	6
TOTAL HOURS.....		16

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

**Allowed courses are EECS 546, EECS 644, EECS 670, EECS 690 or EECS 713.

ENGINEERING PHYSICS - ELECTRO-MECHANICAL CONTROL SYS. CONC.

FRESHMAN YEAR – FALL		HOURS
CHEM 150	Chemistry for Engineers	5
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
ME 228	Computer Graphics	3
PHSX 150	Seminar in Phys., Astr., & Engineering Physics .....	.5
TOTAL HOURS.....		16.5

FRESHMAN YEAR – SPRING		HOURS
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 211	General Physics I, and	4
PHSX 216	General Physics I Laboratory	1
-or-		
PHSX 213	General Physics I Honors.....	5
TOTAL HOURS.....		17

SOPHOMORE YEAR – FALL		HOURS
EECS 211	Circuits I.....	3
EECS 140	Introduction to Digital Logic Design.....	4
MATH 220	Applied Differential Equations, or ...	
MATH 320	Elementary Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II, and	3
PHSX 236	General Physics II Laboratory	1
-or-		
PHSX 214	General Physics II Honors	4
TOTAL HOURS.....		16

SOPHOMORE YEAR – SPRING		HOURS
EECS 212	Circuits II	4
EECS 268	Programming II	4
MATH 223	Vector Calculus	3
PHSX 313	General Physics III.....	3
PHSX 316	Intermediate Physics Lab.....	1
TOTAL HOURS.....		15

JUNIOR YEAR – FALL		HOURS
EECS 360	Signal & System Analysis	4
EPHX 521	Mechanics I.....	3
ME 311	Mechanics of Materials.....	4
ME 312	Basic Engineering Thermodynamics	3
	KU Core Elective*	3
TOTAL HOURS.....		17

JUNIOR YEAR – SPRING		HOURS
EECS 312	Electronic Circuits I.....	3
EPHX 511	Introductory Quantum Mechanics.....	3
ME 501	Mechanical Engineering Design Process	3
ME 628	Mechanical Design I	3
	KU Core Elective*	3
TOTAL HOURS.....		15

SENIOR YEAR – FALL		HOURS
EPHX 516	Physical Measurements	4
EPHX 531	Electricity & Magnetism.....	3
	Engineering Elective**.....	3
ME 708	Microcomp. Appl. in Mech. Engineering	3
	KU Core Elective*	3
TOTAL HOURS.....		16

SENIOR YEAR – SPRING		HOURS
EECS 444	Control Systems	3
EPHX 601	Design of Physical and Electronic Systems.....	4
ME 642	Capstone Design Project Option B, or ...	
ME 643	Capstone Design Project Option C**	3
	KU Core Elective*	6
TOTAL HOURS.....		16

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** ME 642 (Design Project B – Formula Car) requires ME 627 to be taken in the previous semester as the engineering elective. ME 643 (Design Project C – Biomechanics) requires ME 633 to be taken in the previous semester as the engineering elective. ME 641 (Design Project A) is also available, but has several prerequisite courses that would need to be taken.



INFORMATION TECHNOLOGY

WHAT DO THEY DO?

Information Technology graduates will have a background in mathematics and sciences, programming and software development, system administration, information security, web systems and technologies, system integration, computer networking, data management, operating systems and multimedia systems. They will be able to address the IT needs of the users in an organization by identifying, creating, applying and integrating state-of-the-art computing technologies.

WHERE DO THEY WORK?

Graduates with degrees in information technology can work in any and all industries.

WHAT ARE THEY PAID?

Typical salaries will vary depending on the IT career path. It is anticipated the salary range will be similar to graduates holding a bachelor's degree in information systems.

National average starting salary range: \$45,700 - \$68,000

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU INFORMATION TECHNOLOGY STUDENTS

Assurant Employee Benefits	B/E Aerospace
BNSF Railway	Blue Cross & Blue Shield
BlueScope Buildings	Boeing Co.
Burns & McDonnell	Celeritas Technologies
Cerner Corporation	Commerce Bank
ConocoPhillips	Data Systems International
Devon Energy	Digital Evolution Group
DST Systems Inc.	EMC
Ericsson	FishNet Security
Gallup	H&R Block
IBM	KANA Software
KCP&L	Koch Industries Inc.
LockPath Inc.	Microsoft
Multi Service Corporation	Nat'l Weather Service
Nestle Purina PetCare Co.	NetApp
Netsmart Technologies	NIC
Payless ShoeSource	Pella Corp.
Perceptive Software Inc.	Propylon
Sprint	Textron Inc.
Tradebot Systems	UHLIG LLC
Union Pacific Railway	

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www.engr.ku.edu

785-864-3881

studyengineering@ku.edu

INFORMATION TECHNOLOGY CURRICULUM

The BS in Information Technology must be completed by taking courses at the KU Edwards Campus in Overland Park. In addition, students planning to attain the degree will need to transfer key credits from other academic institutions as not all required courses are available through KU. The following plan presents what a student transferring to KU from a community college after two years would be expected to complete. Most of these courses are also available through KU.

FRESHMAN YEAR – FALL		HOURS
Composition I		3
College Algebra		3
Programming Fundamentals*		4
Accounting I*		3
Public Speaking		3
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
Composition II		3
Discrete Structures I*		3
Programming Algorithms*		4
KU Core Elective **		3
General Psychology		3
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
Data Structures*		4
Discrete Structures II*		3
Chemistry or Biology with Lab		4-5
Survey of Economics		3
TOTAL HOURS.....		14 - 15
SOPHOMORE YEAR – SPRING		
Database Management***		4
UNIX Scripting and Utilities***		3
Physics with Lab		4-5
KU Core Elective **		3
TOTAL HOURS.....		15
JUNIOR YEAR – FALL		
MATH 365 Statistics		3
MGMT 305 Survey of Management		3
IT 310 Computer Org. and Platform Technologies		3
IT 340 Computer and Information Security		3
ENGL 362 Technical Writing		3
TOTAL HOURS.....		15
JUNIOR YEAR – SPRING		
SA&D 402 Project Management		3
IT 320 Systems & Network Administration		3
IT 330 Web Systems and Technologies		3
IT 342 Information Security Management		3
KU Core Elective **		3
TOTAL HOURS.....		15
SENIOR YEAR – FALL		
IT 410 Software Engineering & Management		3
IT 420 Operating Systems		3
IT 422 Computer Networks		3
IT Senior Elective #1		3
IT 490 IT Capstone I		3
TOTAL HOURS.....		15
SENIOR YEAR – SPRING		
IT 416 System Architecture and Integration		3
IT 430 Human Computer Interaction		3
IT 450 Social and Professional Issues		3
IT Senior Elective #2		3
IT 492 IT Capstone II		3
TOTAL HOURS.....		15

*This specific course is not offered at KU, however an equivalent course from KU may be substituted. Consult your adviser.

** Students must ensure the electives they choose fulfill all remaining KU Core requirements.

*** No equivalent course is offered at KU; it must be transferred from a different university.



INTERDISCIPLINARY COMPUTING

WHAT DO THEY DO?

Interdisciplinary computing students utilize computing within the context of another discipline.

Graduates collaborate with scientists or other professionals, applying their computing expertise to large-scale problems. They might use grid computing to study the first few picoseconds after the Big Bang or process enormous data streams from telescopic mapping experiments to analyze the orbits of potential Earth-crossing asteroids. They could manage and expand biological databases to study the causes of worldwide biodiversity decline, apply machine-learning techniques to design better chemotherapies, or develop optimization techniques to locate tornado sirens for maximum population coverage. Their expertise in two fields provides the ability to more efficiently and economically develop new computing applications and technologies for their field of specialization. KU interdisciplinary computing students specialize in one of five concentrations:

- | | |
|-----------|-----------|
| Astronomy | Geography |
| Biology | Physics |
| Chemistry | |

WHERE DO THEY WORK?

Graduates of the program might expect to work in a variety of fields, including:

- | | |
|-------------------------------|---------------------------|
| • Academic labs | • Computational astronomy |
| • Computational biology | • Computational chemistry |
| • Computational physics | • Gov't-sponsored labs |
| • Geographic mapping industry | |

WHAT ARE THEY PAID?

Because this is such a new degree field no information about salary offers is yet available. It is anticipated salaries will be similar to those of computer science graduates.

Bachelor's degree candidates, computer science

National average starting salary range: \$51,100 - \$76,900.

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU INTERDISCIPLINARY COMPUTING STUDENTS

- | | |
|------------------------------|----------------------------|
| Accenture | Amsted RPS |
| Blue Cross/Blue Shield | Booz-Allen & Hamilton Inc. |
| Cerner Corp. | EMC |
| Epic | Ericsson |
| Evolytics | FishNet Security |
| Gallup | Hill's Pet Nutrition |
| Intouch Solutions | Johnson Controls |
| Koch Industries, Inc | Multi Service Corp. |
| Nat'l Weather Service | NIC |
| NorthWind Technical Services | |
| Peace Corps | Perceptive Software |
| Sprint | |

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INTERDISCIPLINARY COMPUTING ASTRONOMY CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
	KU Core Elective *.....	3
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II.....	3
PHSX 236	General Physics II Laboratory	1
TOTAL HOURS.....		17
SOPHOMORE YEAR – SPRING		
ASTR 391	Physical Astronomy, Honors	3
EECS 368	Programming Language Paradigms.....	3
EECS 388	Computer Systems & Assembly Language.....	4
MATH 223	Vector Calculus	3
	KU Core Elective *.....	3
TOTAL HOURS.....		16
JUNIOR YEAR – FALL		
ASTR 591	Stellar Astronomy	3
ASTR 596	Observational Astrophysics.....	1
EECS 448	Software Engineering I.....	4
EECS 510	Introduction to the Theory of Computing.....	3
MATH 526	Applied Mathematical Statistics I.....	3
	KU Core Elective *.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – SPRING		
ASTR 592	Galactic & Extragalactic Astronomy.....	3
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
PHSX 313	General Physics III	3
PHSX 316	Intermediate Physics Lab	1
TOTAL HOURS.....		15
SENIOR YEAR – FALL		
ASTR 503	Undergraduate Research	2
ASTR	Astronomy Elective #1	3
COMS 130	Speaker-Audience Communication.....	3
EECS 581	Computer Science Design I	3
EECS	Senior Elective #1**	3
TOTAL HOURS.....		14
SENIOR YEAR – SPRING		
ASTR	Astronomy Elective #2	3
EECS 582	Computer Science Design II	3
EECS	Senior Elective #2**	3
EECS	Senior Elective #3**	3
	KU Core Elective *.....	3
TOTAL HOURS.....		15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** Senior Electives are EECS 563, EECS 638, EECS 645, EECS 647, EECS 648, EECS 649, EECS 660, EECS 662, EECS 665, EECS 672, EECS 690 and any EECS course 700 level or above.

INTERDISCIPLINARY COMPUTING BIOLOGY CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
CHEM 130	Foundations of Chemistry I	5
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
TOTAL HOURS.....		18
FRESHMAN YEAR – SPRING		
CHEM 135	Foundations of Chemistry II.....	5
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
TOTAL HOURS.....		17
SOPHOMORE YEAR – FALL		
BIOL 150	Principles of Molecular & Cellular Biology.....	4
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
MATH 290	Elementary Linear Algebra.....	2
TOTAL HOURS.....		14
SOPHOMORE YEAR – SPRING		
BIOL 152	Principles of Organismal Biology	4
EECS 368	Programming Language Paradigms.....	3
EECS 388	Computer Systems & Assembly Language.....	4
MATH 223	Vector Calculus	3
	KU Core Elective *	3
TOTAL HOURS.....		17
JUNIOR YEAR – FALL		
BIOL 350	Principles of Genetics	3
BIOL 400	Fundamentals of Microbiology, or	
BIOL 435	Introduction to Neurobiology	3
EECS 448	Software Engineering I	4
EECS 510	Introduction to the Theory of Computing.....	3
	KU Core Elective *	3
TOTAL HOURS.....		16
JUNIOR YEAR – SPRING		
BIOL 408	Physiology of Organisms	3
BIOL 412	Evolutionary Biology	3
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
	KU Core Elective *	3
TOTAL HOURS.....		17
SENIOR YEAR – FALL		
BIOL	Biology Elective **	3
COMS 130	Speaker-Audience Communication.....	3
EECS 581	Computer Science Design I	3
EECS	Senior Elective #1***	3
MATH 526	Applied Mathematical Statistics I.....	3
TOTAL HOURS.....		15
SENIOR YEAR – SPRING		
PHIL	Philosophy Elective ****	3
EECS 582	Computer Science Design II	3
EECS	Senior Elective #2***	3
EECS	Senior Elective #3***	3
	KU Core Elective *	3
TOTAL HOURS.....		15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** Biology electives are chosen from BIOL 413, BIOL 414, BIOL 416, BIOL 417 and BIOL 550.

*** Senior Electives are EECS 563, EECS 638, EECS 645, EECS 647, EECS 648, EECS 649, EECS 660, EECS 662, EECS 665, EECS 672, EECS 690 and any EECS course 700 level or above.

**** Philosophy electives are PHIL 160, PHIL 320 and PHIL 375.

INTERDISCIPLINARY COMPUTING CHEMISTRY CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
CHEM 130	Foundations of Chemistry I	5
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I	4
ENGL 101	Composition	3
MATH 121	Calculus I	5
TOTAL HOURS		18

FRESHMAN YEAR – SPRING		HOURS
CHEM 135	Foundations of Chemistry II	5
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I	4
ENGL 102	Critical Reading & Writing	3
MATH 122	Calculus II	5
TOTAL HOURS		17

SOPHOMORE YEAR – FALL		HOURS
CHEM 350	Organic Chemistry	3
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
MATH 290	Elementary Linear Algebra	2
PHSX 210	General Physics I	3
PHSX 216	General Physics I Laboratory	1
TOTAL HOURS		17

SOPHOMORE YEAR – SPRING		HOURS
EECS 368	Programming Language Paradigms	3
EECS 388	Computer Systems & Assembly Language	4
MATH 220	Applied Differential Equations	3
MATH 223	Vector Calculus	3
PHSX 212	General Physics II	3
PHSX 236	General Physics II Laboratory	1
TOTAL HOURS		17

JUNIOR YEAR – FALL		HOURS
CHEM 530	Physical Chemistry I	3
COMS 130	Speaker-Audience Communication	3
EECS 448	Software Engineering I	4
EECS 510	Introduction to the Theory of Computing	3
	KU Core Elective *	3
TOTAL HOURS		16

JUNIOR YEAR – SPRING		HOURS
CHEM 531	Physical Chemistry I Lab	2
CHEM 535	Physical Chemistry II	4
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
TOTAL HOURS		14

SENIOR YEAR – FALL		HOURS
CHEM 698	Undergraduate Research Problems	2
EECS 581	Computer Science Design I	3
EECS	Senior Elective #1**	3
MATH 526	Applied Mathematical Statistics I	3
	KU Core Elective *	3
TOTAL HOURS		14

SENIOR YEAR – SPRING		HOURS
EECS 582	Computer Science Design II	3
EECS	Senior Elective #2**	3
EECS	Senior Elective #3**	3
	KU Core Elective *	3
	KU Core Elective *	3
TOTAL HOURS		15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** Senior Electives are EECS 563, EECS 638, EECS 645, EECS 647, EECS 648, EECS 649, EECS 660, EECS 662, EECS 665, EECS 672, EECS 690 and any EECS course 700 level or above.

INTERDISCIPLINARY COMPUTING GEOGRAPHY CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
	KU Core Elective *.....	3
TOTAL HOURS.....		16

FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16

SOPHOMORE YEAR – FALL		
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
GEOG	Geography Basic Courses #1**	3
MATH 290	Elementary Linear Algebra.....	2
	KU Core Elective *.....	3
TOTAL HOURS.....		16

SOPHOMORE YEAR – SPRING		
EECS 368	Programming Language Paradigms	3
EECS 388	Computer Systems & Assembly Language.....	4
GEOG	Geography Basic Courses #2**	3
MATH 223	Vector Calculus	3
	KU Core Elective *.....	3
TOTAL HOURS.....		16

JUNIOR YEAR – FALL		
EECS 448	Software Engineering I.....	4
EECS 510	Introduction to the Theory of Computing.....	3
GEOG 311	Map Conception and Development.....	4
GEOG 358	Principles of Geographical Info. Sys.	4
TOTAL HOURS.....		15

JUNIOR YEAR – SPRING		
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
GEOG 558	Intermediate Geographical Info. Sys.	4
GEOG	Geography Elective #1***	3
TOTAL HOURS.....		15

SENIOR YEAR – FALL		
COMS 130	Speaker-Audience Communication.....	3
EECS 581	Computer Science Design I	3
EECS	Senior Elective #1***	3
GEOG 526	Remote Sensing Environment	4
MATH 526	Applied Mathematical Statistics I.....	3
TOTAL HOURS.....		16

SENIOR YEAR – SPRING		
EECS 582	Computer Science Design II	3
EECS	Senior Elective #2***	3
EECS	Senior Elective #3***	3
GEOG	Geography Elective #2***	4
	KU Core Elective *.....	3
TOTAL HOURS.....		16

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** Selected from a list identified as Geography Basic Courses in the EECS Department Handbook.

*** Geography Electives are GEOG 513, GEOG 517, GEOG 560, GEOG 726 and GEOG 758.

**** Senior Electives are EECS 563, EECS 638, EECS 645, EECS 647, EECS 648, EECS 649, EECS 660, EECS 662, EECS 665, EECS 672, EECS 690 and any EECS course 700 level or above.

INTERDISCIPLINARY COMPUTING PHYSICS CONCENTRATION

FRESHMAN YEAR – FALL		HOURS
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
	KU Core Elective *.....	3
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
EECS 140	Introduction to Digital Logic Design, or	
EECS 168	Programming I.....	4
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
EECS 210	Discrete Structures	4
EECS 268	Programming II	4
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 212	General Physics II.....	3
PHSX 236	General Physics II Laboratory.....	1
TOTAL HOURS.....		17
SOPHOMORE YEAR – SPRING		
EECS 368	Programming Language Paradigms.....	3
EECS 388	Computer Systems & Assembly Language.....	4
MATH 223	Vector Calculus	3
PHSX 313	General Physics III	3
	KU Core Elective *.....	3
TOTAL HOURS.....		16
JUNIOR YEAR – FALL		
EECS 448	Software Engineering I.....	4
EECS 510	Introduction to the Theory of Computing.....	3
PHSX 503	Undergraduate Research.....	2
PHSX 521	Mechanics	3
	KU Core Elective *.....	3
TOTAL HOURS.....		15
JUNIOR YEAR – SPRING		
COMS 130	Speaker-Audience Communication.....	3
EECS 560	Data Structures	4
EECS 678	Introduction to Operating Systems	4
PHSX 511	Introductory Quantum Mechanics	3
PHSX 316	Intermediate Physics Lab	1
TOTAL HOURS.....		15
SENIOR YEAR – FALL		
EECS 581	Computer Science Design I	3
EECS	Senior Elective #1**	3
MATH 526	Applied Mathematical Statistics I.....	3
PHSX 531	Electricity and Magnetism	3
PHSX	Physics Elective #1***	3
TOTAL HOURS.....		15
SENIOR YEAR – SPRING		
EECS 582	Computer Science Design II	3
EECS	Senior Elective #2**	3
EECS	Senior Elective #3**	3
PHSX	Physics Elective #2***	3
	KU Core Elective *.....	3
TOTAL HOURS.....		15

* Students must ensure the electives they choose fulfill all remaining KU Core requirements.

** Senior Electives are EECS 563, EECS 638, EECS 645, EECS 647, EECS 648, EECS 649, EECS 660, EECS 662, EECS 665, EECS 672, EECS 690 and any EECS course 700 level or above.

*** Physics electives are chosen from Physics courses numbered 600 level and above.



MECHANICAL ENGINEERING

WHAT DO THEY DO?

Mechanical engineers use principles of mechanics and energy to develop, design, manufacture and test tools, machines, motors, engines and other mechanical devices. They also work in areas such as medicine and medical devices, patent law, business, forensic engineering and engineering sales.

The department's focus is on ensuring graduates have the skills to succeed on the job. KU Mechanical Engineering students have the opportunity to complete real-world projects as part of their education, work with companies to deliver capstone senior design projects or participate in cutting-edge research sponsored by companies. Alumni on the Advisory Board provide guidance on skill sets and curricula that are most needed in industry.

WHERE DO THEY WORK?

- Aerospace and automotive industries
- Design, construction and consulting firms
- Manufacturing and plant operations
- Power generation
- Bioengineering firms
- Alternative energy, sustainability and conservation firms
- Petroleum and transportation industries

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary range: \$51,300 - \$75,100

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU MECHANICAL ENGINEERS

Altec Industries	Bayer Corp.
BD Medical	Berry Plastics
Black & Veatch	BNSF Railway
Bombardier Learjet	Burns & McDonnell
Caterpillar	Cessna
Chesapeake Energy	CVR Energy
DuPont	Engineered Air
ExxonMobil	Frito-Lay
Garmin	General Motors
Grundfos	Halliburton
Harley-Davidson	Honda R & D
Hill's Pet Nutrition	Honeywell FM&T
Hospira Pharmaceutical	Jacobs Engineering
J.E. Dunn	KCP&L
Kiewit	Orbis Biosciences
Peace Corps	Sprint
Spirit AeroSystems	SPX
Westar Energy	Wireco World Group

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MECHANICAL ENGINEERING CURRICULUM

128 credit hours required for graduation

FRESHMAN YEAR – FALL		HOURS
ENGL 101	Composition	3
MATH 121	Calculus I.....	5
ME 228	Computer Graphics	3
CHEM 150	Chemistry for Engineers	5
TOTAL HOURS.....		16
FRESHMAN YEAR – SPRING		
ENGL 102	Critical Reading & Writing.....	3
MATH 122	Calculus II	5
ME 208	Intro. to Digital Comp. Methods in Mech. Engr.....	3
PHSX 211	General Physics I.....	4
PHSX 216	General Physics I Laboratory	1
TOTAL HOURS.....		16
SOPHOMORE YEAR – FALL		
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
ME 211	Statics & Intro. to Mechanics	3
ME 312	Basic Engineering Thermodynamics	3
PHSX 212	General Physics II.....	3
PHSX 236	General Physics II Laboratory	1
TOTAL HOURS.....		15
SOPHOMORE YEAR – SPRING		
COMS 130	Speaker-Audience Communication.....	3
EECS 316	Circuits, Electronics & Instrumentation.....	3
EECS 318	Circuits & Electronics Laboratory	1
ME 311	Mechanics of Materials.....	3
ME 320	Dynamics	3
ME 321	Dynamics Simulations	1
ME 510	Fluid Mechanics	3
TOTAL HOURS.....		17
JUNIOR YEAR – FALL		
MATH 365	Elementary Statistics	3
ME 306	Science of Materials.....	3
ME 307	Engineering Materials Lab.....	2
ME 412	Thermal Systems.....	3
ME 508	Numerical Analysis.....	3
ME 612	Heat Transfer.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – SPRING		
ECON	Economics Elective *	3
ME 501	Mechanical Engineering Design Process	2
ME 628	Mechanical Design	3
ME 661	Finite Element Method for Stress Analysis.....	3
PHIL	Ethics Elective **	3
TOTAL HOURS.....		14
SENIOR YEAR – FALL		
ME 455	Mechanical Measurements & Experimentation.....	4
ME 682	System Dynamics & Control Systems	3
ME	Adv. Engr. Elective and Capstone Option ***	4-5
	General Elective ****	3
	KU Core Elective †	3
TOTAL HOURS.....		17-18
SENIOR YEAR – SPRING		
ME	Capstone Design Option ***	2-3
ME	Advanced Engineering Elective	3
	General Electives ****.....	4
	KU Core Electives †.....	6
TOTAL HOURS.....		15-16

* Economics elective may be ECON 104, ECON 142, or ECON 144.

** Ethics electives are PHIL 160, PHIL 180, or PHIL 320.

*** Courses chosen in consultation with adviser. Options include: Automotive; Biomechanics; Energy/Sustainability; Thermo-fluids; and Mechanical Design.

**** Courses chosen from an approved list available from the department.

† Students must ensure the electives they choose fulfill all remaining KU Core requirements. Students must complete 128 hours to earn the degree. After meeting all curricular requirements students may fill remaining credit hour requirements with general electives.

MECHANICAL ENGINEERING CONCENTRATIONS & OPTIONS

The Department of Mechanical Engineering has established additional curricula that allow students to pursue a more specialized course of study and still meet graduation criteria. Students take the courses previously outlined with the following substitutions or additions.

BIOMECHANICS CONCENTRATION

A student pursuing a biomechanics concentration chooses electives from the biomechanics courses offered. These electives are:

- 1) One of the following: BIOL 150/151, BIOL 152/153, BIOL 240, or BIOL 246;
- 2) ME 633;
- 3) ME 643; and
- 4) One of the following: ME 750, ME 751, ME 752, ME 753, ME 754, ME 755, ME 756, ME 757, ME 760, or ME 765.

Consult the Department of Mechanical Engineering for more information.

MECHANICAL ENGINEERING PREMEDICAL PLAN

143 credit hours

Chemistry – Take CHEM 130 and CHEM 135 instead of Chem 150;

Advanced Chemistry – CHEM 330, CHEM 331, CHEM 335, CHEM 336;

Biological Science – BIOL 150, BIOL 152;

Biochemistry I, BIOL 636, is required for application to some medical school programs.

DUAL DEGREE MECHANICAL ENGINEERING AND BUSINESS

A student who wants to combine business with engineering may enroll in a program leading to a bachelor's degree in both fields. Full-time enrollment and careful planning enables a student to earn the two degrees in five years. Consult the Department of Mechanical Engineering for more information.



PETROLEUM ENGINEERING

WHAT DO THEY DO?

Petroleum engineers are involved in the exploration and production of oil or natural gas. Once these resources are discovered, petroleum engineers work to understand the geologic formation and properties of the rock containing the reservoir, determine the drilling methods to be used, and monitor drilling and production operations. They design equipment and processes to achieve the maximum profitable recovery of oil and gas.

WHERE DO THEY WORK?

- Major oil companies
- Independent oil exploration
- Production and service companies

WHAT ARE THEY PAID?

Bachelor's degree candidates

National average starting salary: \$73,000 - \$110,400

EXAMPLES OF ORGANIZATIONS THAT RECRUIT KU PETROLEUM ENGINEERS

Abengoa Bioenergy Biomass of Kansas	
Accenture	Baker Hughes
Berexco	Chesapeake Energy
ConocoPhillips	Continental Resources
CVR Energy	Devon Energy
Energy Transfer	ExxonMobil
EnCana Oil & Gas	Halliburton Energy
Kinder Morgan	Koch
Leidos Engineering	Lonquist & Co.
National Oilwell Varco	NorthWestern Energy
Occidental Petroleum	Packers Plus Energy Service
Peace Corps	Schlumberger
TransCanada	Trinity Consultants
U.S.Armed Forces	Weatherford International

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PETROLEUM ENGINEERING CURRICULUM

FRESHMAN YEAR – FALL		HOURS
C&PE 117	Energy in the Modern World	1
CHEM 130	Foundations of Chemistry I	5
ENGL 101	Composition *	3
MATH 121	Calculus I.....	5
	KU Core Elective **.....	3
TOTAL HOURS.....		17
FRESHMAN YEAR – SPRING		
C&PE 121	Intro. to Computers in Engineering	3
C&PE 127	Intro. to Petro. Engineering Profession	1
CHEM 135	Foundations of Chemistry II	5
ENGL 102	Critical Reading & Writing *.....	3
MATH 122	Calculus II	5
TOTAL HOURS.....		17
SOPHOMORE YEAR – FALL		
C&PE 217	Intro. to Petroleum Drilling Engineering.....	2
C&PE 219	Drilling Fluids Laboratory	1
GEOL 101	Introduction to Geology	3
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra.....	2
PHSX 210	General Physics I.....	3
PHSX 216	General Physics I Laboratory.....	1
TOTAL HOURS.....		15
SOPHOMORE YEAR – SPRING		
C&PE 327	Reservoir Engineering I.....	4
GEOL 103	Fundamentals of Geology Laboratory	2
MATH 526	Applied Math Statistics	3
CE 201	Statics.....	2
ME 312	Basic Engineering Thermodynamics.....	3
PHSX 212	General Physics II.....	3
TOTAL HOURS.....		17
JUNIOR YEAR – FALL		
C&PE 511	Momentum Transfer	3
C&PE 522	Economic Appraisal of C&PE Projects	2
C&PE 527	Reservoir Engineering II	4
C&PE 528	Well Logging.....	3
C&PE 619	Petroleum Engineering Lab I	3
PHSX 236	General Physics II Laboratory.....	1
TOTAL HOURS.....		16
JUNIOR YEAR – SPRING		
C&PE 521	Heat Transfer.....	3
C&PE 618	Secondary Recovery	4
CE 310	Strength of Materials.....	4
GEOL 331	Sedimentology and Surface Processes	4
COMS 130	Speaker-Audience Communication *	3
TOTAL HOURS.....		18
SENIOR YEAR – FALL		
C&PE 620	Enhanced Oil Recovery	3
C&PE 627	Petroleum Production.....	3
EECS 315	Electrical Circuits and Machines.....	3
GEOL 535	Petroleum & Subsurface Geology	4
	KU Core Elective **.....	3
TOTAL HOURS.....		16
SENIOR YEAR – SPRING		
C&PE 617	Drilling and Well Completion.....	3
C&PE 628	Petroleum Engineering Design.....	3
	Basic Science or Engineering Elective.....	3
	KU Core Electives **.....	6
TOTAL HOURS.....		15

* Or approved KU Core Communication course or experience.

** Students must ensure the electives they choose fulfill all remaining KU Core requirements.



ENGINEERING

2014-2015

CURRICULUM &
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THE GENIUS MOVE

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