Undergraduate

Curriculum Guide

for

Electrical & Computer Engineering

KANSAS STATE UNIVERSITY | Electrical and Computer Engineering

ELECTRICAL ENGINEERING
Curriculum for Bachelor of Science in Electrical Engineering
(129 hours total)
Effective Fall 2015
Accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org)

Fall Semester Courses		Sem Hrs			Spring Semester Courses		Sem Hrs
FRESHMAN							
ENGL	100 Exposit Writing 1*	3			ECON	110 Prin Macroecon	3
SPCH	105 Public Speaking 1A	2			PHYS	213 Engg Physics 1	5
CHM	210 Chemistry 1	4			MATH	221 Anal Geom Calc 2	4
MATH	220 Anal Geom Calc 1	4			CHM	230 Chemistry 2 or	4
ECE	210 Intro to Electrical Engg	3			BIOL	198 Prin of Biology	
ECE	015 New Student Assembly	0			ECE	115 New Student Dsn Proj	1
	TOTAL	16				TOTAL	17
SOPHOMORE							
ECE	241 Intro to Computer Engg	3			CIS	209 C Prog for Engineers	3
MATH	240 Elem Diff Equations	4			MATH	222 Anal Geom Calc 3	4
PHYS	214 Engg Physics 2	5			ECE	511 Circuit Theory 2	3
ECE	410 Circuit Theory 1	3			ECE	525 Electronics 1	3
CHE	354 Basic Materials	1			STAT	510 Intro to Prob & Stat	3
CHE	356 Electronic Materials	1					
	TOTAL	17				TOTAL	16
JUNIOR							
ECE	431 Microcontrollers	3			ECE	502 Electronics Lab	2
ECE	526 Electronics 2	3			ECE	512 Linear Systems	3
ECE	557 Electromagnetics	4			ECE	581 Energy Conversion 1	3
ECE	540 App Sci Computing	3			ENGL	415 Writ Comm Engr	3
Humanities / Social Sci Elective**		3			Humanities / Social Sci Elective**		3
					Technical Electives***		3
	TOTAL	16				TOTAL	17
SENIOR							
ECE	530 Control Sys Design	3			ME	513 Thermo 1	3
CE	530 Statics & Dynamics	3			Humanities / Social Sci Elective**		3
ECE	590 Senior Design Exp	3			Technical Electives***		9
Technical Electives***		6					
	TOTAL	15				TOTAL	15

*Students must complete the appropriate prerequisite credits for ENGL 415, but may apply only 3 hours of ENGL 415
prerequisite credits toward degree requirements.

**Humanities and Social Science electives are to be selected from the approved College of Engineering H&SS list.

Students should select these courses as needed to complete the requirements of the K-State 8 General Education program.

***Technical Electives must be selected to complete one of the areas of emphasis. Technical Electives must come from
the approved technical electives list.

ECE C-prerequisite Policy:
For the good and benefit of the student and their future employer, the ECE department enforces a C-prerequisite policy for all
courses listed by number in the curriculum and for any in-major technical elective course applied toward the degree. A grade
of C or better must be earned in all prerequisites to such a course before enrolling in that course.

ECE Transfer Course Policy:
No more than twelve (12) credit hours of courses in electrical and computer engineering may be transferred to Kansas State
University for credit toward a bachelor degree in either electrical engineering or computer engineering. Further, those courses
selected for transfer credit must be equivalent to courses in the list below and must be such that the prerequisites for the listed
course are also satisfied. Any courses transferred must be taken from ABET accredited programs: ECE 210, ECE 241, ECE 410, ECE
525, ECE 557, ECE 581.

ELECTRICAL ENGINEERING - General Option (129 hours)

Effective Fall 2017   (www.ece.ksu.edu)

Advisor:
Printed:

DOE:
Class:
Flowchart: 75
Hours:

FRESHMAN

ENGL 100 (3) Expo Writ 1	ECON 110 (3) Macroeconomics
ECE 015 (0) New Student Assem	ECE 115 (1) New Student Dsn Proj
MATH 220 (4) Anal Geo & Calc 1	MATH 221 (4) Anal Geo & Calc 2 PR: MATH 220**
COMM 105 (2) Public Spkg	PHYS 213 (5) Engg Physics 1 PR/Conc: MATH 221**
ECE 210 (3) Intro to EE PR/Conc: MATH 220**	
CHM 210 (4) Chem I	CHM 230 (4) or BIOL 198

SOPHOMORE

CHE 354 (1) Basic Materials PR: CHM 210** PR/conc: PHYS 213**	
CHE 356 (1) Electronic Materials PR: CHE 354**	STAT 510 (3) Prob & Stat PR: MATH 221**
MATH 340 (4) Diff Eq PR: MATH 221**	MATH 222 (4) Anal Geo & Calc 3 PR: MATH 221**
PHYS 214 (5) Engg Phys II PR: PHYS 213** PR: MATH 221**	CIS 209 (3) C Prog for Engg PR: MATH 220**
ECE 410 (3) Cir Thry I PR: MATH 221** PR: ECE 210**	ECE 511 (3) Cir Thry II PR: ECE 410** PR: MATH 240**
ECE 241 (3) Int Cmp Engg	ECE 525 (3) Electronics 1 PR: ECE 410** or 519**

JUNIOR

H & SS (3) b.	H & SS (3) b.
ECE 557 (4) EM Theory 1 PR: ECE 410** PR: MATH 222** PR: PHYS 214**	ENGL 415 (3) Writ Comm PR: ENGL 100**
ECE 540 (3) App Sci Comp PR: STAT 510** PR: CIS 209** or 308**	Tech Elec (3) a.
ECE 502 (2) Electronics Lab PR: ECE 511** PR/Conc: ECE 526**	
ECE 431 (3) Microcontrollers PR: ECE 241** PR: CIS 200 or 209**	ECE 512 (3) Linear Sys PR: ECE 511** PR: ECE 540**
ECE 526 (3) Electronics 2 PR: ECE 511** PR: ECE 525**	ECE 581 (3) Eng Conv 1 PR: ECE 410** or 519**

SENIOR

	H&SS (3) b.
ECE 590 (3) Senior Design Exp I PR: ECE 511**, 525**, 540** PR: ENGL 415**	ECE 591 (3) Senior Design Exp II PR: ECE 590
Tech Elec (6) a.	Tech Elec (6) a.
ECE 530 (3) Cont Sys Des PR: MATH 240** PR: ECE 512**	
CE 530 (3) Stat & Dyn PR: MATH 222** PR: PHYS 213**	ME 513 (3) Thermo 1 PR: MATH 222** PR: PHYS 213**

NOTE: PREREQUISITES ARE SHOWN IN THE COURSE BLOCK.
a. Technical electives must be selected to complete one of the areas of emphasis. Technical Electives must come from the approved ECE Technical Electives List.
b. Humanities and Social Science (H & SS) electives must be selected from the list of courses approved by the College of Engineering.
Students should select these courses as needed to complete the requirements for the K-State 8 Gen Ed Pgm.

** Denotes C or better must be earned in prerequisite course

Currently Enrolled ◥   Passed ▨   Retaken ◪   Failed ◼   Warning ▬

COMPUTER ENGINEERING
Curriculum for Bachelor of Science in Computer Engineering
(129 hours total)
Effective Fall 2015

Accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org)

Fall Semester Courses		Sem Hrs			Spring Semester Course		Sem Hrs
FRESHMAN							
ENGL	100 Exposit Writing 1*	3			PHYS	213 Engg Physics 1	5
SPCH	105 Public Speaking 1A	2			MATH	221 Anal Geom Calc 2	4
CHM	210 Chemistry 1	4			CIS	200 Fund Comp Prog	4
MATH	220 Anal Geom Calc 1	4			ECE	210 Intro to Electrical Engg	3
ECE	241 Intro to Computer Engg	3			ECE	115 New Student Dsn Proj	1
ECE	015 New Student Assembly	0					
	TOTAL	16				TOTAL	17
SOPHOMORE							
ECE	441 Des Dig Sys	3			MATH	222 Anal Geom Calc 3	4
PHYS	214 Engg Physics 2	5			STAT	510 Intro to Prob & Stat	3
MATH	240 Elem Diff Equations	4			ECON	110 Prin Macroecon	3
CIS	300 Prog/Data Structures	3			CIS	308 C/C++ Language Lab	1
					ECE	431 Microcontrollers	3
					ECE	410 Circuit Theory 1	3
	TOTAL	15				TOTAL	17
JUNIOR							
CIS	501 Sft Arch & Design	3			ECE	512 Linear Systems	3
ECE	511 Circuit Theory 2	3			ECE	557 Electromagnetics	4
ECE	525 Electronics 1	3			ECE	649 Computer Design 1	3
MATH	510 Discrete Math	3			ENGL	415 Writ Comm Engr	3
ECE	540 App Sci Computing	3			Humanities / Social Sci Elective**		3
Humanities / Social Sci Elective**		3					
	TOTAL	18				TOTAL	16
SENIOR							
CIS	520 Operating Systems 1****	3			ECE	631 Microcmptr Sys Dsn****	3
ECE	590 Senior Design Exp	3			ECE	645 Digital Electronics****	3
ECE	643 Comp Engg Des Lab****	3			Humanities / Social Sci Elective**		3
ECE	542 Computer Networking****	3			Technical Electives***		6
Technical Electives***		3					
	TOTAL	15				TOTAL	15

*Students must complete the appropriate prerequisite credits for ENGL 415, but may apply only 3 hours of ENGL 415 prerequisite credits toward degree requirements.

**Humanities and Social Science electives are to be selected from the approved College of Engineering H&SS list.
Students should select these courses as needed to complete the requirements of the K-State 8 General Education program.

***Technical Electives must be selected from the list of accepted courses.

****Offered only in semester shown in curriculum

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ECE Transfer Course Policy:
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COMPUTER ENGINEERING (129 hours)

Effective Fall 2017 (www.ece.ksu.edu)

Advisor:
Printed:

DOE:
Class:
Flowchart: 47
Hours:

FRESHMAN	SOPHOMORE	JUNIOR	SENIOR

FRESHMAN

ECE 015 (0)
New Student Assem

ECE 115 (1)
New Student Dsn Proj

ENGL 100 (3)
Expo Writ 1

MATH 220 (4)
Anal Geo & Calc 1

MATH 221 (4)
Anal Geo & Calc 2
PR: MATH 220**

CHM 210 (4)
Chem I
PR/Conc: MATH 221**

PHYS 213 (5)
Engg Physics I
PR: PHYS 213**
PR: MATH 221**

COMM 105 (2)
Public Speaking

ECE 210 (3)
Intro EE
PR/Conc: MATH 220**

ECE 241 (3)
Intro Cmpt Engg

CIS 200 (4)
Prog Fund
PR: ECE 241**

SOPHOMORE

ECON 110 (3)
Macroeconomics

STAT 510 (3)
Prob & Stat
PR: MATH 221**

MATH 340 (4)
Diff Eq
PR: MATH 221**

MATH 222 (4)
Anal Geo & Calc 3
PR: MATH 221**

PHYS 214 (5)
Engg Phys II
PR: PHYS 213**
PR: MATH 221**

ECE 431 (3)
Microcontrollers
PR: ECE 241**
PR: CIS 200**

ECE 441 (3)
Des Dig Sys
PR: ECE 210**
PR: ECE 241**

ECE 410 (3)
Cir Thry I
PR: MATH 221**
PR: ECE 210**

CIS 300 (3)
Data/Prog Structures
PR: CIS 200**

CIS 308 (1)
C/C++ Lab
PR: CIS 300**

JUNIOR

H & SS (3)
Gen Ed
b.

H & SS (3)
Gen Ed
b.

ECE 540 (3)
Appl Sci Comp
PR: STAT 510**
PR: CIS 209 or 308**

ENGL 415 (3)
Writ Comm
PR: ENGL 100**

ECE 525 (3)
Electronics I
PR: ECE 410** or 519**

ECE 649 (3)
Comp Design 1
PR: ECE 441**

MATH 510 (3)
Discrete Math
PR: MATH 221**

ECE 557 (4)
Electromagnetics
PR: PHYS 214**
PR: ECE 410**
PR: MATH 222**

ECE 511 (3)
Cir Thry II
PR: MATH 240**
PR: ECE 410**

ECE 512 (3)
Linear Sys
PR: ECE 511**, ECE 540**

CIS 501 (3)
Sft Arch & Design
PR: CIS 300**

SENIOR

H & SS (3)
Gen Ed
b.

ECE 590 (3)
Senior Design Exp I
PR: ECE 511, 525, 540**
PR: ENGL 415**

ECE 591 (3)
Senior Design Exp II
PR: ECE 590

Tech Elec (6)
a.

ECE 631 (3)
Microcomp Sys Design
PR: ECE 431, ECE 525**
PR: CIS 308 or 209

ECE 542 (3)
Computer Networking
PR: ECE 241**
PR: programming language

ECE 645 (3)
Digital Electronics
PR: ECE 441**, ECE 525**,
PR: ECE 511**

ECE 643 (3)
CMPEN Design Lab
PR: ECE 441**
PR/Conc: ECE 649**
PR: CIS 209 or 308**

CIS 520 (3)
Operating Sys 1
PR: ECE 431**
PR: CIS 308, 501**

NOTE: PREREQUISITES ARE LISTED IN THE COURSE BLOCK.
a. Technical Electives must be selected from the list of approved technical electives.
b. Humanities and Social Science (H & SS) electrives must be selected from the list of courses approved by the College of Engineering.
Students should select these courses as needed to complete the requirements for the K-State 8 Gen Ed Pgm.

** Denotes C or better must be earned in prerequisite course

Currently Enrolled ◣   Passed ▪   Retaken ◤   Failed ■   Warning ▬

ECE Programs

Electrical Engineering

Each student in Electrical Engineering must select an area of emphasis during their sophomore or junior years. See the area of emphasis descriptions below and refer to the ***Required and Suggested Courses and Technical Electives Table*** for applicable courses.

Bioengineering

The bioengineering area of emphasis applies electrical engineering domain expertise to challenges faced by the health care and life science communities. The area targets the development of (a) hardware and software for the acquisition, analysis, and presentation of biomedical data and (b) mathematical and computational tools for the simulation and analysis of biological systems. Some courses emphasize emerging consumer technologies whose mobile, wireless capabilities advance the use of telemedicine, intelligent wearable systems, and home care tools as supplements to traditional hospital-based health care. Others focus on applications of complex-system and control theory to model, analyze, and optimize biological systems at different time and space scales. Students in this area value the positive impact that engineering can make on quality of life for all individuals, including vulnerable elderly, disabled, and rural populations.

Electronics and Communications

Selecting the electronics and communications emphasis lets students focus on the technologies underlying a nearly limitless array of electronic devices used in daily life. From cellular phones, to computers, to the design of integrated circuit devices, this focus area prepares you for designing and building hardware to make new products of the future possible. The emphasis includes required courses in wireless systems and digital signal processing, plus a culminating design experience with project construction and laboratory work. Students in this area will be prepared for careers ranging from work in advanced government labs and national defense, to companies that design and build products for the next generation.

Power Systems

The electric power industry is in the midst of exciting change. What was once a largely passive system is being redesigned to incorporate sensors, smart devices, advanced computer controls at many levels, and efficient handling of large amounts of electrical energy. Courses focus on modeling of different components of the system, design and operation of large interconnected power systems, fault analysis and protection, power electronics technologies for control of power devices, and renewable energy technologies. Students are exposed to smart grid concepts and various computer tools needed for analysis and design of efficient power systems. Students engaged in this area expect to work on challenging problems related to the delivery of large amounts of electrical energy in a safe, reliable, economical, clean, and sustainable manner.

Computer Engineering

Computer engineering covers the design and application of computers and associated software development. The curriculum includes the basics of computer's internal circuits and structures, the application of microcontrollers and processors, and how computers communicate with other computers and devices through networking. Students in this program will learn how to design basic digital hardware through use of digital circuits employing Boolean logic. A major component of the program also focuses on embedded systems, in which a computer is used to implement dedicated tasks, usually with real-time computing restraints. Computer communication is an important part of computer engineering with courses describing compression and packetization of data.

Examples of systems and devices that are designed by computer engineers include microwave ovens, automobiles, tractors, HDTVs, DVRs, GPSs, internet routers, video game systems, and cellular phones. In fact, if a device contains electronics, it most likely contains one or more computers and computer engineers are an important part of their development.

Required and Suggested Courses and Technical Electives

Course	Semester	Description	Electrical Engineering			Computer Engineering
			Bioengineering	Electronics and Communications	Power Systems	
CIS 450	F,S	Computer Arch and Operations (3)				•
CIS 525	F	Telecomm and Data Comm Systems (3)				•
CIS 551	F	Intro to Computer and Information Security (3)				•
ECE 441	F,S	Design of Digital Systems (3)		•		Δ
ECE 530	F,S	Control Systems Design (3)				•
ECE 542	F	Computer Networking (3)		•		Δ
ECE 571	S	Intro to Biomedical Engineering	Δ			
ECE 624	F	Power Electronics (3)			Δ	
ECE 628	Demand	Electronic Instrumentation (3)	•			
ECE 631	S	Microcomputer System Design (3)	•	Δ^{D1}		Δ^{D}
ECE 636	Demand	Intro to Computer Graphics (3)				•
ECE 641	S	Advanced Digital Design using Logic Synthesis (3)		•		•
ECE 643	F	CMPEN Design Lab (3)				Δ^{D}
ECE 645	S	Digital Electronics (3)		•		Δ
ECE 647	F	Digital Signal Processing (3)	•	Δ		•
ECE 648	F	Multimedia Compression (3)				•
ECE 649	F,S	Computer Design 1 (3)		•		Δ
ECE 660	S	Communication Systems 1 (3)	•	Δ	•	•
ECE 662	Every 3rd sem.	Design of Communication Circuits (3)	•	Δ^{D1}		
ECE 670	F	Engineering Appllications of Machine Intelligence (3)			•	•
ECE 681	F	Wind and Solar Engg. (3)			•	
ECE 684	S	Power Lab (3)			Δ	
ECE 685	F	Power Systems Design (3)			Δ^{D}	
ECE 686	S	Power Systems Protection (3)			•	
ECE 694	F	Optoelectronics (3)		•		
ECE 696	Every 3rd sem.	Integrated Circuit Design (3)		Δ^{D1}		
ECE 715	F	Electroacoustics (3)	•	•		
ECE 722	S	Audio Engineering (3)	•	•		
ECE 724	S	Analog Electronics (3)	•	•		
ECE 728	Demand	Mixed Signal Measurements (3)	•	•		
ECE 730	Demand	Control Systems Analysis and Design (3)	•		•	
ECE 731	Demand	Advanced Microcomputer System Design (3)				•
ECE 733	Demand	Real-Time Embedded Systems Design (3)	•			•
ECE 736	Demand	Discrete-Time and Computer-Control Systems (3)				•
ECE 746	Demand	Fault Diagnosis in Digital Systems (3)				•
ECE 747	Demand	Advanced Digital Filtering (3)	•	•		•
ECE 749	F	Computer Design 2 (3)				•
ECE 760	S	Wireless Communications (3)	•	•		
ECE 764	Every 3rd sem.	Design of Microwave Circuits (3)		Δ^{D1}		
ECE 772	F	Theory and Tech of Bioinstrumentation (2)	Δ			
ECE 773	F	Bioinstrumentation Design Lab (1)	Δ^{D}			

Δ = Required   • = Recommended ^{1} = Choose at least 1 course   D = Denotes design course

Technical electives may aslo be taken from other departments and colleges. See DARS report for complete list.

Technical Electives
for Electrical and Computer Engineering students

Department	Acceptable Courses	Maximum Hours
ARTS AND SCIENCES		
• *Biochemistry*	Above 499	No limit
• *Biology*	Above 197	No limit
• *Chemistry*	Above 230 [A]	No limit
• *Geology*	Any course	No limit
• *Mathematics*	Any course with MATH 221 as a prerequisite and 551	No limit
• *Physics*	Above 515	No limit
• *Statistics*	Above 499 except 702	No limit
BUSINESS *ADMINISTRATION*		
• *Accounting*	Any course	
• *Finance*	Any course	6 total from the
• *Management*	Any course	four depts. listed
• *Marketing*	Any course	
ENGINEERING		
• *Biological and Agricultural*	510 or above	No limit
• *Architectural*	411 or above	No limit
• *Construction Science*	500 or above	No limit
• *Chemical*	350 or above	No limit
• *Civil*	300 or above [B]	No limit
• *Computer and Information Sciences*	300 or above [C]	No limit
• *Electrical and Computer*	[D]	No limit
• *General*	[E]	No limit
• *Industrial and Manufacturing Systems*	241 or above	No limit
• *Mechanical*	ME 212 or above [F]	No limit
• *Nuclear*	Above NE 385	No limit
VETERINARY MEDICINE		
	Any course	No limit

Technical Electives for Electrical and Computer Engineering students must be chosen to satisfy degree requirements.

[A] CHM 230 is acceptable for B.S. degree in Computer Engineering.
[B] If CE 333 and ME 512 are both taken, credit will be given for CE 530 along with 3 hours of technical elective credit. Taking CE 333 or ME 512 alone will not count for CE 530 credit.
[C] CIS 200 and 308 are acceptable for a maximum of two credit hours for EE students.
[D] ECE 441, 571 and 600 or above are acceptable for B.S. degree in Electrical Engineering. ECE 502, 526, 530, 571, 581, and 600 or above are acceptable for B.S. degree in Computer Engineering.
[E] Any course except applicable Humanities and Social Sci. Electives, DEN 201, and DEN 202.
[F] Except for those courses not open to engineering majors.

K-STATE 8 Information for ECE students

The K-STATE 8 general education program helps students widen their perspectives, explore relationships among subjects and build critical and analytical thinking skills. K-STATE 8 exposes students to a broad range of knowledge in different academic areas. The program shapes well-rounded thinkers and helps prepare students for careers, graduate school and other post-graduate experiences.

What are the requirements for the K-STATE 8 General Education Program?

Each student must successfully complete credit-bearing courses or experiences to cover all of the K-STATE 8 areas. Some of the K-STATE 8 areas may be covered in the student's major. The intent of the K-STATE 8 is for students to explore the perspectives of disciplines that may be quite different from those of their own majors. For that reason, a minimum of four different course prefixes (e.g., AGEC, MATH, FSHS) must be represented in the fulfillment of the K-STATE 8 requirements. The K-STATE 8 areas include:

- *Aesthetic Experience and Interpretive Understanding*
- *Empirical and Quantitative Reasoning*
- *Ethical Reasoning and Responsibility*
- *Global Issues and Perspectives*
- *Historical Perspectives*
- *Human Diversity within the US*
- *Natural and Physical Sciences*
- *Social Sciences*

K-STATE 8 and ECE

Since both the electrical and computer engineering curriculums are well defined, the incorporation of the K-STATE 8 system is rather simple. The table below shows the K-STATE 8 areas that are covered by the required courses of the ECE curriculum.

K-State 8 Area	EE	CMPEN
Aesthetic Experience and Interpretive Understanding	H&SS	H&SS
Empirical and Quantitative Reasoning	MATH 220	MATH 220
Ethical Reasoning and Responsibility	ECE 590	ECE 590
Global Issues and Perspectives	ECON 110	ECON 110
Historical Perspectives	H&SS	H&SS
Human Diversity within the U.S.	H&SS	H&SS
Natural and Physical Sciences	CHM 210	CHM 210
Social Sciences	ECON 110	ECON 110

The boxes that are labeled H&SS are humanities and social science courses that the student is free to choose within the approved College of Engineering H&SS course list. These courses must be chosen to cover the three remaining K-STATE 8 required areas not covered by the ECE required courses. Therefore the student must simultaneously choose H&SS courses from the approved College of Engineering H&SS list and cross-reference the chosen course's K-STATE 8 tags with the unfulfilled requirements.

K-STATE 8 course tag information can be found at: http://www.k-state.edu/kstate8/lists/index.html

Humanities & Social Science Electives

Suggestions for K-State 8 Requirements
Freshman and Sophomore level

Aesthetic Experience & Interpretive Understanding
(BSE, CE, CHE, CMPEN, CS, EE, IE, IS, ME)

ARCH	240, 290	
ART	106, 180, 190, 195	
CNS	110	Hist. of Building & Construction
COMM	120	Intro to Human Comm.
DANCE	All	
ENGL	220-253	
ENGL	260	British Literature
ENGL	270-287	
ENGL	295	Selected studies in English
ENGL	297#	Honors Intro Humanities I
ENVD 210	210	Indian Art, Architecture,& Culture
HIST	297#	Honors intro Humanities
MUSIC	All	
PHILO	120	Intro to Philosophy of Art
THTRE	211-265	Performance
THTRE	270, 280	Non-Performance

All Foreign Languages (except native language)

Ethical Reasoning & Responsibility (CE)

PHILO	100	Intro to Philosophical Problems
PHILO	115	Intro to Philosophy of Religion
PHILO	125	Intro to Philosophy of Science
PHILO	130	Intro to Moral Philo
PHILO	135	Introduction to Social and Political Philo
PHILO	150	Intro to Philosophy of Feminism
PHILO	160	Intro to Philosphy of Law
THTRE	261	Fundamentals of Acting
GWSS	105	Intro to Women's Studies

Global Issues and Perspectives (IE)

ANTH	200, 204	
ECON	110	Macreconomics
ENGL	280	Studies in world literature & culture
ENVD	210	Indian Art, Architecture, & Culture
GEOG	100	World Regional Geog
GEOG	200	Human Geog
HIST	101, 102, 111, 112	
MUSIC	249, 281	
POLSC	110, 135	

All Foreign Languages (except native language)

Historical Perspectives
(BSE, CHE, CMPEN, CS, EE, IE, IS, ME)

AMETH	160	Intro Amer. Ethnic Studies
ANTH	260	Introduction to Archaeology
ARCH	240	Science, Technology, & Arch
ARCH	290	Arch. Through the ages
ART	195	Survey of Art Hist.
CNS	110	Hist. of Building & Const.
ENGL	233	Reformation to Enlightenment
ENGL	230	Classical Cultures
ENGL	234	Modern Literature
ENGL	190, 260, 270, 287, 297#	
HIST	101	Rise Of Europe
HIST	102	The Modern Era
HIST	111, 112	World Hist. To and From 1450
HIST	200	Topics in History
HIST	251	Hist. Us To 1877
HIST	252	Hist. US Since 1877
HIST	297#	Honors Intro Humanities
MC	110	Mass Communication
MC	112	Web Communication in Society
MUSIC	160	Music Listening Lab
MUSIC	170	Hist. of Rock and Roll
MUSIC	171	Underground rock 1968-1993
MUSIC	220	Topics in Music
MUSIC	245	Intro to American Music
MUSIC	250	Intro to Music
PHILO	145	Hist. Intro to Philosophy
POLSC	115	U S Politics
THTRE	270	Intro to Theatre

Human Diversity within the U.S.
(ARE, BSE, CE, CHE, CMPEN, CNSM, CS, EE, IS, ME)

AMETH	160	Intro to Amer. Ethnic Studies
ANTH	220	Intro to Linguistic Anthropology
ENGL	270, 285	
FSHS	110	Intro to Human Development
HIST	251, 252	US History
LEAD	212	Intro to Leadership
MUSIC	172, 245	
SOCIO	211	Intro to Sociology
GWSS	105	Introduction to Women's Studies

ARE=Architectural **BSE**=Biological/Ag **CE**=Civil **CHE**=Chemical **CMPEN**=Computer Engg **CNSM**=Construction Science & Management **CS**=Computer Science

EE=Electrical **IE**=Industrial **ME**=Mechanical

Humanities & Social Science Electives
Suggestions for K-State 8 Requirements
300 Level and Higher: CHE &ME require 6hrs of H&SS at the 300 level or higher

Aesthetic Experience & Interpretive Understanding
(BSE, CE, CHE, CMPEN, CS, EE, IE, IS, ME)

AMETH	450#	Comparative Ethnic Studies
ARCH	301	Appreciation Of Architecture
ART	any course 300 or higher	
COMM	323, 330, 430#, 431, 432, 475#, 535, 537	
DANCE	any course 300 or higher	
ENGL	325-390,440#,450#,461#,470#,545#,580	
GEOG	510#	Geography of the American West
MC	331#	Digital Photography for Mass Media
MUSIC	310-321,350-373,391,400-417,465-482,490#,492#	
PHILO	303	Writing Philosophy
THTRE	361#, 560, 565#	Performance
THTRE	662, 667-672#	Non-Performance
GWSS	350	Gender in American Film

All Foreign Language Course 300 or higher (except native language)

Ethical Reasoning & Responsibility (CE)

AGEC	315#	Contemporary Issues in Global Food and Ag
AMETH	370, 461	
ANTH	514#	Language of Culture
COMM	431, 434	
DAS	355, 455#	
GNHE	310#	Human Needs
HIST	549, 556	Bill of Rights
LAR	322	Environmental Issues and Ethics
LEAD	405#, 450#	
MUSIC	510#	A survey of Music Therapy
PHILO	305#,330-332#,335#,336,337,365,380,390,501,535#	
PLPTH	300#	Microbes, Plants & the Human Perspective
POLSC	301	Intro to Political Thought
SOCIO	360, 362, 507#	
THTRE	361#	Performance
GWSS	305, 410#,460,480,560	

Global Issues and Perspectives (IE)

AGEC	315#	Contem. Issues in Global Food& Ag Systems
AMETH	450#	Comparative Ethnic Studies
CHM	315#	Env. Science: A chemistry Prospective
COMM	480	Intercultural Communication
ENGL	580	Selected World Literature
GEOG	300, 331, 332, 340, 505	
HIST	330, 508#, 516, 517#, 520#, 545#, 578#, 584#, 587#	
LAR	322	Environmental Issues and Ethics
LEAD	350#	Culture and Context in Leadership
PHILO	336, 337	
POLSC	333	World Politics
SOCIO	363, 431#, 505, 507#	
GWSS	321#, 405#	

Historical Perspectives
(BSE, CHE, CMPEN, CS, EE, IE, IS, ME)

AMETH	351, 352, 353#, 354#	
ANTH	333	Plagues
ARCH	301	Appreciation Of Architecture
COMM	330, 425, 430#, 432, 435, 545	
ENGL	325#, 350, 361, 362, 381, 382, 435#, 470#	
HIST	Any Course 300 or higher	
MATH	570	History Of Mathematics
MUSIC	311, 405, 420#	
PHILO	300, 301, 501	
POLSC	321	Kansas Politics And Government
THTRE	572#, 573#	
GWSS	325, 405#, 410#	

Human Diversity within the U.S.
(ARE, BSE, CE, CHE, CMPEN, CNSM, CS, EE, IS, ME)

AMETH	351-354, 370, 450#, 461	
COMM	322#, 323, 420#, 470, 480, 535, 545	
ENGL	388, 389, 435#, 476#	
FSHS	301	The Helping Relationship
FSHS	510#	Human Developing and Aging
GEOG	310, 500, 510#	
HIST	511#, 522#, 525#, 530#, 531#	
HIST	533#, 537, 542#, 557#, 558#	
LEAD	350#	Culture and Context in Leadership
LEAD	430#	Women and Leadership
MUSIC	420#	History of Jazz
MUSIC	510#	A survey of Music Therapy
PHILO	331, 332, 380	
SOCIO	361#, 362, 432#, 450, 463, 470, 480, 510	
THTRE	672#	American Ethnic Theatre
GWSS	300-350	

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 # denotes the course has a pre-requisite   4/21/2017

COURSE PREREQUISITE TABLE

COURSE	PREREQUISITES
ECE 210 Introduction to Electrical Engineering	MATH 220(c)
ECE 241 Introduction to Computer Engineering	
ECE 410 Circuit Theory I	MATH 221, ECE 210
ECE 431 Microcontrollers	CIS 200 or 209, ECE 241
ECE 441 Design of Digital Systems	ECE 210, ECE 241
ECE 502 Electronics Lab	ECE 511, ECE 526(c)
ECE 511 Circuit Theory II	MATH 240, STAT 510, ECE 410
ECE 512 Linear Systems	ECE 511, ECE 540
ECE 519 Electric Circuits and Controls	PHYS 214
ECE 525 Electronics I	ECE 410 or ECE 519
ECE 526 Electronics II	ECE 511, ECE 525
ECE 530 Control System Design	ECE 511, ECE 512, MATH 240
ECE 540 Applied Scientific Computing for Engineers	STAT 510 and CIS 209 or 308
ECE 542 Computer Networking	ECE 241, high-level programming language
ECE 557 Electromagnetic Theory I	PHYS 214, ECE 410
ECE 571 Intro to Biomedical Engineering	MATH 222, PHYS 214
ECE 581 Energy Conversion I	ECE 410 or ECE 519
ECE 582 Wind Energy Research	Instructor Permission
ECE 590 Senior Design Experience	ENGL 415, DEN 325
ECE 624 Power Electronics	ECE 511, ECE 525
ECE 628 Electronic Instrumentation	ECE 502, ECE 526
ECE 631 Microcomputer System Design	CIS 209 OR 308 OR ME 400; ECE 431; ECE 525 OR 519
ECE 633 Real-Time Embedded Systems	CIS 621, CIS 622
ECE 636 Introduction to Computer Graphics	CIS 308 or 209, CIS 300, MATH 222 or 551
ECE 641 Advanced Digital Design using Logic Synthesis	ECE 441
ECE 643 Comp Engineering Design Lab	CIS 308 or CIS 209, ECE 441, ECE 649(c)
ECE 645 Digital Electronics	ECE 511, ECE 525, ECE 441
ECE 647 Digital Filtering	ECE 512
ECE 648 Multimedia Compression	ECE 512 or MATH 551, CIS 308 or CIS 209
ECE 649 Computer Design I	ECE 441
ECE 660 Communication Systems I	ECE 512(c)
ECE 661 Communication Systems II	ECE 660
ECE 662 Design of Communication Circuits	ECE 526, ECE 502
ECE 670 Engineering Applications of Machine Intelligence	CIS 200 or 209, PHYS 214
ECE 681 Wind and Solar Engineering System Design	ECE 525 or ECE 519
ECE 684 Power Lab	ECE 581, ECE 624
ECE 685 Power Systems Design	ECE 581
ECE 686 Power Systems Protection	ECE 581
ECE 694 Optoelectronics	ECE 525, ECE 557, CHE 354, CHE 356
ECE 696 Integrated Circuit Design	ECE 241, ECE 525
ECE 715 Electroacoustics	ECE 511
ECE 722 Audio Engineering	ECE 525 (ECE 526 recommended)
ECE 724 Analog Electronics	ECE 502, ECE 526
ECE 725 Integrated Circuit Devices & Processes	ECE 525, CHE 354, CHE 356
ECE 728 Mixed Signal Measurements	ECE 512 or graduate standing
ECE 730 Control Sys Analysis and Design	ECE 530 or ME 640, ME 730
ECE 731 Advanced Microcomputer System Design	ECE 631

COURSE	PREREQUISITES
ECE 733 Real-Time Embedded System Design	CIS 721(c)
ECE 736 Discrete-Time and Computer-Control Sys	ECE 530 or ME 640
ECE 746 Fault Diagnosis in Digital Systems	ECE 541(c) or ECE 631(c)
ECE 747 Digital Signal Processing Lab	ECE 512, ECE 647(c)
ECE 749 Computer Design II	ECE 649
ECE 758 Electromagnetic Theory II	ECE 557
ECE 760 Wireless Communications	ECE 660
ECE 764 Design of Microwave Circuits	ECE 502, ECE 512, ECE 526, ECE 557
ECE 765 Digital Radio Hardware Design	ECE 696 (c), ECE 696 or ECE 764 or consent of instructor
ECE 771 Control Theory Applied to Bioengineering	ECE 530(c) or ME 640(c) and a basic physiology course
ECE 772 Theory and Techniques of Bioinstrumentation	ECE 773(c), AP 773(c)
ECE 773 Bioinstrumentation Lab	ECE 772(c), AP 773(c), ECE 502
ECE 780 Power Seminar	Junior standing
ECE 824 Advanced Power Electronics	ECE 624
ECE 828 Topic in Instrumentation	ECE 628
ECE 830 Advanced Systems Theory	ECE 530 or ME 640
ECE 840 Computer Engineering Methods for Analysis, Simulation and Design	ECE 512
ECE 841 Network Theory	STAT 410 or STAT 510, high-level programming language
ECE 842 Parallel Processing	ECE 512, ECE 649
ECE 845 Sequential Machines	MATH 510, ECE 649
ECE 846 Computer Engineering Methods for Analysis, Simulation and Design II	ECE 840
ECE 849 Topics in Computer Engineering	ECE 649
ECE 855 Advanced Topics in Electromagnetic Theory	ECE 758
ECE 861 Applied Probability Theory and Random Processes	ECE 512
ECE 866 Transform Processing of Digital Signals	ECE 861
ECE 867 Digital Image Processing	ECE 512
ECE 870 Neural Networks in Engineering	ECE 670
ECE 881 Advanced Topics in Electric Energy Systems	ECE 686
ECE 882 Power Quality	ECE 624, ECE 685
ECE 885 Power Systems Operation and Control	ECE 685
ECE 887 Distribution System Engineering	ECE 685
ECE 888 Power System Stability and Control	ECE 581, ECE 685
ECE 890 Advanced Electrical Theory	M.S. student
ECE 895 Solid-State Elect Devices	CHE 354, CHE 356, ECE 557, ECE 696
ECE 896 Graduate Seminar in ECE	
ECE 897 Research in EE	Consent of instructor
ECE 898 Master's Report	
ECE 899 Master's Thesis	
ECE 931 Advanced Topics in Control Theory	ECE 830
ECE 949 Advanced Topics in Computer Engineering	ECE 845
ECE 962 Advanced Topics in Communications	ECE 861
ECE 963 Signal Detection Theory	ECE 861
ECE 965 Information Theory	ECE 861
ECE 967 Advanced Topics in Digital Signal Processing	ECE 866 or ECE 968
ECE 968 Advanced Digital Filtering	ECE 647, ECE 861
ECE 971 Advanced Topics in Bioengineering	ECE 771 or ECE 772
ECE 999 Dissertation Research	

c = Concurrent or prerequisite