Secondary Field Guide 2015-2016

Department of Industrial and Enterprise Systems Engineering
University of Illinois

Revised Fall 2015

The Secondary Field Option provides virtually unlimited opportunity and flexibility to tailor the General Engineering curriculum to one's interests and career goals. Secondary Field Options are of two broad classifications, pre-approved and customized, as described below.

Preapproved Options have designated titles and a specified list of courses from which several may be selected. However, approval for the substitution of a course for one on the specified list may be requested via a petition form submitted to the Department. Customized Secondary Field Options may be created to achieve goals in areas not provided by Preapproved Options. To do this, a suitable title and all the courses must be petitioned for acceptance by the Department. Petition approval is based on the merit of the Secondary Field Option and the coherence of the courses within it relative to the student's goals.

Pursuit of Campus or College Minors or completion of James Scholar Contracts may be integrated with Customized Secondary Field Option in the General Engineering curriculum. Courses taken may be applied to both the Minor or Contract and the Secondary Field, although 6 credit hours must be exclusive to the Secondary Field. This may also be done for coursework applying to a second major in engineering or a dual degree in another UIUC College.

For an explanation of procedures to declare Secondary Field Option and petitions associated with them, consult the Chief Advisor of the Department or www.ise.illinois.edu.

As can be seen by the titles of Secondary Field Options presented below, interesting and varied choices can be made. Often such Secondary Field Options are tailored to a student's long-term goals of integrating a basic engineering education with specialized activity related to engineering in direct or indirect ways. Secondary Field Options may be technically or non-technically oriented. Each requires a minimum of 12 hours of coursework.

Electing a Secondary Field Option is usually done in the sophomore or junior year before the first course is taken in the Secondary Field Option. Until this decision is made, you are presumably 'undecided.' In either case, you must make a declaration on the Information Survey section of the ISE Course Planning Consultant. A Secondary Field Option declaration includes an option code and title.

The various option categories are:

Option Code – Description	Typical Titles
1 – Undecided	Undecided
2 – Pre-approved SFO: with no course changes	Automotive Eng
3 – Pre-approved SFO: with petitioned course changes	Control Sys
4 – Customized SFO: title from list; all courses petitioned	Finance
5 – Custom SFO: both title and all courses petitioned	Modeling

Pre-Approved Choices (Options 2 and 3)

Pre-approved Secondary Field Options consist of related courses in the areas of study listed below. For **Option 2**, any 12 hours of credit may be selected from the course list given for the Field Option. For **Option 3**, 12 hours still applies, but a request for the substitution of a course not in the list for Option 2 may be made via a petition form (see below). Generally speaking, one course substitution is reasonable. Two or more suggest that a customized choice be made (see below). Petition approval by the ISE Department is based on the coherence of the complete set of courses chosen.

In several instances, the following course substitutions may be used interchangeably to comply with prerequisites of listed courses within the pre-approved Secondary Field Option:

CEE 202, ECE 413, GE 331, IE 300, STAT 400/MATH 463

CEE 201, GE 330, IE 310

MSE 406/ME 330, TAM 324/CEE 300

ECE 486, GE 320, ME 340

In the list that follows, choices of titles for Secondary Field Option under Options 2 or 3, and approved course lists for those in Option 2, are effective **Fall 2005**. (Courses which appeared on a prior Option 2 list, but no longer do, remain valid if taken when the list was effective.)

- **Automotive Engineering**
- **Bioengineering (Engineering Option)**
- **Business Systems Integration and Consulting**
- **Civil Engineering Structures**
- **Communications and Computer Systems**
- **Computer-Aided Design and Manufacturing (CAD/CAM)**
- **Computer Graphics**
- **Computer Science**
- **Construction**
- **Control Systems**
- **Engineering Administration**
- **Engineering Marketing**
- **Environmental Quality**
- **Manufacturing Engineering**
- **Nondestructive Testing and Evaluation**
- **Operations Research**
- **Quality Control**
- **Rehabilitation Engineering**
- **Robotics**
- **Theoretical and Applied Mechanics**

For each of these options, courses may be chosen without further approval to complete the Secondary Field Option.

Approval for other courses not listed may be sought by petition. The most likely candidates are non-permanent and experimental offerings relevant to the various fields.

Customized Choices (Options 4 and 5)

Customized Secondary Field Options can be created to achieve specific career goals not

addressed by Pre-approved Secondary Field Options. Customized Secondary Field Options differ from Pre-approved ones in that no sets of specified courses to choose from have been predefined. For all Customized Secondary Field Options, a course list must be constructed and submitted for approval by the Department. To do so, a petition form (see below) stating the title and courses for the Secondary Field Option must accompany the Course Planning Consultant Information Survey declaration. Petition approval by the Department of Industrial and Enterprise Systems Engineering is based on both the merit of the Secondary Field Option and the coherence of the courses within it relative to the student's goals. For **Option 4**, established titles exist, but not course lists.

Selection of courses for a Customized Secondary Field Option can be made through research of the Courses Catalog and with the assistance of the student's academic advisor. In addition, for Option 4, a limited database of courses previously selected exists that may be reviewed in the Chief Advisor's Office. But one should note that courses cited are only suggestive, as they were approved on a case-by-case basis with pertinent goals in mind and available/appropriate course offerings have changed over time.

In the list that follows, choices for Secondary Field Titles under Option 4 are effective **Fall 2005**. They represent titles for Customized Secondary Field Options that have been petitioned in the past.

- Accountancy
- Acoustics
- Agricultural Engineering (or any other engineering discipline)
- Agronomy
- Animal Science
- Applied Mathematics
- Applied Statistics
- Astronomy
- Audio Engineering
- Aviation
- Biology

- Chemistry
- Cinematography
- Circuit Analysis and Design
- Economics
- Energy
- Entrepreneurship
- Finance
- Finite Element Analysis
- Fluid Dynamics
- Food Science
- Geography
- Heat Transfer
- History of Engineering, Science and Technology
- Human Factors
- Industrial Design
- Industrial Psychology and Organizational Behavior
- Insurance and Actuarial Science
- Integrated Engineering and Industrial Design
- International Business
- Japanese (or any other language)
- Landscape Architecture
- Machine Design
- Mechatronics
- Meteorology
- MicroElectroMechanical Systems (MEMS)
- Mining and Geological Engineering
- Philosophy
- Political Science
- Power Systems
- Pre-Dentistry
- Pre-Law

- Pre-Medicine
- Pre-Veterinary Science
- Railroad Engineering
- Solar Energy
- Technical Journalism
- Technology and Management
- Telecommunications
- Thermal Science
- Thermodynamics
- Vehicle Dynamics

If a Secondary Field Option title of interest is not found in the above lists of Pre-approved and Customized choices, a title may be created, resulting in the Secondary Field Option being categorized as **Option 5**. For Option 5, an appropriate title and course list must be submitted on the petition and the Information Survey section of the Course Planning Consultant.

This booklet is intended to help in the choice of a Secondary Field Option. It is compiled from information taken from a survey given to seniors in the General Engineering curriculum. Although the secondary fields listed are not the only ones available, this guide is a good summary of what some GE students have taken in the past.

A major caveat with this document is that some courses no longer exist or have had changes in content, credit, title, etc. This is true of the data in this handbook as well, containing information dating from 1996 to the present.

The courses for each Secondary Field Option (SFO) have been included (where available) along with the evaluations of these courses as surveyed in a class of GE390 students. **Please use this unofficial guide purely for reference. Course listings may be incomplete or include outdated courses. When making decisions, be sure to verify details regarding Secondary Field Options on the ISE website. Course ratings for Secondary Field Options listed in this guide may not include all the classes necessary to complete the requirements.**

Students were asked to rate their courses on the following scale:

E	=	Excellent
G	=	Good
F	=	Fair
P	=	Poor
H	=	Horrible

In addition to this rating scheme, the students were also asked to make comments that they felt might be useful to future students. These remarks are presented as *Student Comments*. These comments are the opinions of individual students, and do not necessarily represent the opinions of the Industrial and Enterprise Systems Engineering Department. Students are encouraged to consider these comments, but should also seek out advisors and professors specializing in these fields. The faculty mentor for each pre-approved secondary field has been included with the comments and classes for each field. Students deciding upon a Secondary Field Option should consult these contacts or make an appointment with an advisor.

Due to recent curriculum changes, GE400 (Engineering Law) is no longer a required course in the General Engineering major curriculum. However, it has been applied as either an optional or required course in all of the pre-approved Secondary Field Options. No data has been collected for this course concerning its overall relevance to the individual secondary fields. Future editions of the SFO guide will include more statistics.

Thank you to all of the seniors, juniors, and graduate students who have participated in the SFO survey, and good luck to those of you choosing a Secondary Field Option.

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Pre-Approved Secondary Field Options

Note: Petitioned courses are listed below pre-approved courses.

Secondary Field of Concentration: Automotive Engineering

Faculty Mentor: D. Stipanovic

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	470	Introduction to Robotics	4	0	0	0	0	0
GE	421	Same as ECE 470						
CS	443	Same as ECE 470						
ME	445	Same as ECE 470						
ECE	486	Control Systems	4	0	1	0	0	0
GE	422	Robot Dynamics & Control	4	0	0	0	0	0
ECE	489	Same as GE 422						
ME	446	Same as GE 422						
GE	400	Engineering Law	3	1	0	0	0	0
ME	310	Introductory Gas Dynamics[1]	4	0	0	0	0	0
ME	320	Heat Transfer[1]	4	0	1	0	0	0
ME	360	Signal Processing[1]	3.5	0	1	0	1	0
ME	400	Energy Conversion Systems[1]	3	0	3	1	0	0
ME	403	Internal Combustions Engines	3	0	1	1	0	0
ME	460	Industrial Control Systems	4	0	0	2	0	0
TAM	412	Intermediate Dynamics	4	1	1	1	0	0

[1] recommended only if a prerequisite to another listed course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ABE	466	OFF-Road Engineering	3	1	0	0	0	0
ECE	498	Special Topics in ECE	0-4	1	0	0	0	0
ENG	491	Interdisciplinary Design Project	1-4	2	0	0	0	0
GE	420	Digital Control of Dynm System[2]	4	1	1	0	0	0
GE	412	Fund of Nondestructive Eval	3-4	1	0	0	0	0
GE	497	Independent Study	1-4	1	0	0	0	0
IE	330	Industrial Quality Control	3	0	1	0	0	0
ME	199	Independent Study	1-5	2	0	0	0	0
ME	330	Engineering Materials	4	1	0	0	0	0
ME	472	Intro to Tribology	4	1	0	0	0	0
ME	497	Independent Study	1-4	1	0	0	0	0

[2] one credit hour allowed if taken as GE Design Elective; four hours if not.

Student Comments: (SP07) All courses are difficult but for the most part worthwhile.
(Pre) GE 420 can be a very difficult course.
ME 340 is the prerequisite to ME 360.
ME 400 is basically a second thermodynamics course with more real-world applications.
The choices of classes are limited and the field is a lot of work.
ENG 491 was great real world experience but tough

Secondary Field of Concentration: Bioengineering

Faculty Mentor: M. Moeinzadeh

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BIOE	120	Introduction to Bioengineering	1	14	12	2	1	0
BIOE	498	Special Topics	3	1	1	0	0	0
BIOP	401	Introduction to Biophysics	3	0	0	4	1	1
CHEM	232	Elementary Organic Chemistry I	3	3	8	13	2	1
CHEM	233	Elementary Organic Chem Lab I	2	3	2	5	0	0
ECE	414	Biomedical Instrumentation	3	5	2	4	0	0
BIOE	414	Same as ECE 414						
ECE	415	Biomedical Instrumentation Lab	2	3	0	1	0	0
BIOE	415	Same as ECE 415						
ECE	475	Modeling of Bio-Systems	3-4	1	0	0	0	0
BIOE	475	Same as ECE 475						
GE	400	Engineering Law	4	0	0	0	0	0
IE	340	Human Factors	4	1	2	0	0	0
PSYC	358	Same as IE 340						
AVI	358	Same as IE 340						
KIN	355	Biomechanics of Human Movement	3	1	2	0	1	0
MCB	103	Intro to Human Physiology	3	18	8	3	0	0
MCB	104	Intro to Human Physiology Lab	1	0	0	0	0	0
MCB	150	Molec and Cellular Basis of Life[1]	4	2	3	0	0	0
MCB	250	Molecular Genetics[1]	3	1	1	2	0	0
MCB	251	Exp Technigs in Molecular Biol[1]	2	1	0	0	0	0
MCB	401	Cell & Membrane Physiology	3	4	8	4	2	0
MCB	402	Sys & Integrative Physiology	3	4	2	3	5	0
MCB	403	Cell & Membrane Physiology Lab	2	3	7	3	0	0
MCB	404	Sys & Integrative Physiol Lab	2	3	6	2	2	0
MCB	450	Introductory Biochemistry	3	1	0	1	0	0
BIOE	406	Veterinary Ortho Biomechanics	3	3	0	1	0	0
VB	406	Same as BIOEN 406						

[1] recommended only if a prerequisite to another listed course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ABE	485	Food and Process Eng Design	2	1	0	0	0	0
BIOE	199	Undergraduate Open Seminar	1-5	0	0	0	1	0
BIOE	397	Individual Study	0-4	1	0	0	0	0
BIOE	280	Biomedical Imaging	3	1	0	0	0	0
BIOE	498	Ethics	1-4	0	0	1	0	0
CHEM	332	Elementary Organic Chem II	3	1	0	0	0	0
MCB	334	Functional Human Anatomy	5	0	1	0	0	0
GE	397	Independent Study	0-4	0	0	3	0	0

Student Comments:
CHEM 232 is hard but there are lots of resources to help you. Online course convenient & great TA's
MCB103 is a great class. There's a lot of material, so don't take it unless you're really interested.
BIOE 120 was an easy class, you just sit there and listen to people.
I really enjoyed BIOE 406.
MCB150 was a good class, lots of material but very interesting.
A very interesting and diverse secondary field. Do the college of engineering minor if more interested since it counts for the secondary field and James Scholar honors contract. Anatomy and Physiology was a great class. I learned a lot of valuable information. I continued on and took Anatomy and Physiology II as well.

Secondary Field of Concentration: Business Systems Integration and Consulting
Faculty Mentor: H. Wildblood

At least one course must be chosen from Group I and Group II respectively.
Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
Required								
GE	400	Engineering Law	3	10	3	0	0	1
Group I								
ACCY	200	Fundamentals of Accounting[1]	3	14	26	26	9	1
ACCY	201	Accounting and Accountancy, I[1]	3	9	21	17	2	3
ACCY	202	Accounting and Accountancy, II[1]	3	1	3	0	0	0
ADV	300	Introduction to Advertising	3	17	10	13	5	0
BADM	310	Mgmt and Organizational Beh	3	68	70	34	11	0
BADM	311	Individual Behavior in Orgs	3	5	9	2	2	0
BADM	312	Org Design & Environment	3	4	3	1	1	1
BADM	320	Principles of Marketing	3	23	24	11	1	1
BADM	445	Small Business Consulting	4	6	3	0	0	0
BADM	446	Entrepreneurship Sm Bus Form	4	0	2	0	0	0
BTW	250	Principles Bus Comm	3	2	1	0	0	0
BTW	261	Principles Tech Comm	3	0	3	0	0	0
FIN	221	Corporate Finance	3	16	12	7	0	1
FIN	300	Financial Markets	3	1	0	0	0	0
IE	420	Financial Engineering	3	0	0	0	0	0

[1] A basic accounting course is highly recommended

			# Hrs	Excellent	Good	Fair	Poor	Horrible
Group II								
BADM	432	Intro to Mgt Info Systems	3	1	13	9	8	2
ACCY	432	Same as BADM 432						
BADM	352	Database Design and Management	3	8	10	4	3	0
ACCY	352	Same as BADM 352						
BADM	353	Info Sys Analysis and Design	3	1	1	1	0	0
ACCY	353	Same as BADM 353						
BADM	459	Mgt Info and Control Systems	3	0	0	0	0	0
ACCY	455	Same as BADM 459						
CS	225	Data Structures & Softw Prin	4	1	2	1	0	0
CSE	400	Data Structures, Non-CS Majors	4	3	10	10	5	2

All other 200 and 300 level CS classes
At least one course must be chosen from Group I and Group II respectively.

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	351	IT for Networked Organizations	3	0	1	0	0	0
BADM	310	Management and Organization Beh	3	1	0	0	0	0
CS	110	Programming Lab (Java)	1	0	0	0	1	0
GE	393	Evaluation and Planning of New	3	0	0	0	1	0
GE	393	Feasibility Plan and Opportunity	3	1	0	0	0	0
GE	461	Technology Entrepeneurship	3	1	0	0	0	0
ENG	491	Independent Study	1-4	0	0	1	0	0
ECE	290	Computer Engineering I	3	0	1	0	0	0
GE	393RSL	RSL Network Design Lab	3	4	2	1	0	0
GE	498	Computer-Aided Product Realization	3	1	0	0	0	0

Student Comments:

(F03) FIN 221 is useful for the business world to come. Even for an engineer, some studying is necessary, but you'll benefit from the course without bending over backwards.

(Pre) ACCY 201 is a fairly easy A.

ADV 300 was interesting, but not particularly relevant.

ADV 300 is very interesting and little to no time commitment.

ACCY 200 and ADV 300 are very easy. ACCY 200 was very easy, good for basics.

ACCY 200 is just vocabulary and ACCY 432 has no programming.

ACCY 200 has good general info on balance sheet analysis and financial reports of companies.Pre)

All the BA classes are pretty easy.

BA 310 is very useful and explains the organization of a company really well.

BA310 was good, with a good perspective on management.

BA320 should be titled marketing jargon.

BA 320 and FIN 221 were excellent overall. Although the time commitment was high when approaching exam times, the material was interesting enough to actually want to learn it.

BADM 320 has good marketing and general business information. However, there are probably other classes that would be more applicable to this secondary field of concentration.

BA 445 is a must for the BSI secondary field since you do exactly that: consult for a small business for an entire semester.

BADM 445 is educational because the students get a real consulting project to complete, from start to

finish, with a project team. The lectures here do not discuss consulting as much as expected.

All the MIS classes are fairly simple, except for BA 312, but it's worth it.

BADM 352 was a useful MIS course where skills were learned that can be used in your future career.

BA320 is not very intellectually challenging, just memorizing the names of concepts

CS225 was a fair class in that I hated it and did poorly, but I believe that it was probably possibly for me to have done better. Either way, the class is very difficult w/o previous programming experience.

GE 497 (the networking section) is recommended for use as a topic of conversation at an interview and taking the class helps to get a job. GE497RSL has good hands on experience and no lecture.

Secondary Field of Concentration: Civil Engineering Structures

Faculty Mentor: B. Hall

Preapproved Courses

			# Hrs	Excellen	Good	Fair	Poor	Horrible
CEE	380	Geotechnical Engineering	3	3	6	6	0	0
CEE	460	Steel Structures, I	3	9	7	1	0	0
CEE	461	Reinforced Concrete, I	3	5	6	3	1	0
CEE	462	Steel Structures, II	3	1	0	0	0	0
CEE	463	Reinforced Concrete, II	3	0	1	1	0	0
CEE	465	Design of Structural Systems	3	2	0	0	0	0
GE	400	Engineering Law	3	1	0	0	0	0

Some overlap with GE 410 (if chosen as a design elective). GE 310 counts as prerequisite, do not take CEE 3

Petitioned Courses

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
CEE	312	Route Surveying	3	1	0	0	0	0
CEE	320	Construction Engineering	3	1	0	0	0	0
CEE	310	Transportation Engineering	3	0	1	0	0	0
CEE	360	Structural Engineering	3	0	0	1	0	0
CEE	422	Construction Cost Analysis	3	0	1	0	0	0
CEE	415	Geometric Design of Roads	4	0	1	0	0	0
CEE	498	Special Topics	1-4	0	0	1	0	0
GE	400	Engineering Law	3	2	0	0	0	0
TE	461	Technology Entrepreneurship	3	1	0	0	0	0

Student Comments:

(Pre) CEE 460 is a good course to learn about the connections and design of large structures.
This secondary field supplements CEE design/analysis structural courses very well.
CEE construction management courses are great if interested in construction.
CEE380 deals with geotechnics / soil mechanics so it might not be of interest to everyone.
MATH 380 is just matrix math – useful for solving stiffness matrix problems, but that is all.

Secondary Field of Concentration: Communications and Computer Systems

Faculty Mentor: R.S. Sreenivas

Preapproved Courses

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
CS	225	Data Structures	4	0	0	0	1	0
CS	411	Database Systems	3	0	0	0	0	0
CS	425	Distributed Systems	3	0	0	0	0	0
ECE	428	Same as CS 425						
CSE	424	Same as CS 425						
CS	438	Communication Networks	3	0	0	0	0	0
ECE	438	Same as CS 438						
CSE	425	Same as CS 438						
CSE	400	Data Structures: Non-CS Majors	4	0	0	0	0	0
GE	400	Engineering Law	3	0	0	0	0	0

Secondary Field of Concentration: Computer Aided Dessign and Manufacturing

Faculty Mentor: J. M. Leake

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ME	350	Design for Manufacturability[1]	3	1	3	0	0	1
ME	451	Computer-Aided Mfg Systems	3	0	0	0	0	0
GE	402	Computer-Aided Product Realization	3	0	2	0	0	0
ME	452	Num Control of Mfg Processes	3	0	0	0	0	0
CS	173	Discrete Structures	3	0	0	1	0	0
TAM	302	Engineering Design Principles	3	0	0	0	0	0
ME	471	Intro to Finite Element Anlys	3-4	0	0	0	0	0
CSE	451	Same as ME 471						
AE	420	Same as ME 471						

[1] Recommended Course

Petitioned Courses

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ARTD	426	Computer Applications II	2-4	0	1	0	0	0
AAE	497	Independent Study: Flight Simulator D	1-4	1	0	0	0	0

Student Comments:

(Pre) This field should be called Computer Science. ME 350 had no structure.

CS 400 is very high tech, tablet PC's are used to take notes instead of paper

Secondary Field of Concentration: Computer Graphics

Faculty Mentor: J. M. Leake

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	173	Discrete Structures	3	0	0	1	2	0
CS	225	Data Structures & Softw Prin[1]	4	11	14	5	1	1
CS	418	Interactive Computer Graphics	3	1	0	0	0	0
CSE	427	Same as CS 418						
CS	419	Production Computer Graphics	3	0	0	0	0	0
CS	428	Same as CS 419						

Secondary Field of Concentration: Computer Science

Faculty Mentor: R. S. Sreenivas

Students fulfilling the College of Engineering minor in computer science may simultaneously complete the requirements of the secondary field of concentration. Students with a strong interest in courses other than CS 300-304 are encouraged to take CS 125 in place of CS 101.

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	173	Discrete Structures	3	7	10	15	5	0
CS	225	Data Structures & Softw Prin[1]	4	15	15	5	2	1
CS	231	Computer Architecture I	3	6	10	4	1	0
CS	232	Computer Architecture II	3	4	4	4	0	0
CS	241	Systems Programming	4	1	0	1	0	0
CS	257	Numerical Methods	3	2	2	2	4	0
CS	273	Intro to Theory of Computation	3	1	1	1	1	0
CS	400	Data Structures, Non-CS Majors[1]	4	3	9	9	4	2
CSE	400	Same as CS 400						
CS	411	Database Systems	3	3	1	2	2	0
CS	412	Intro to Data Mining	3-4	0	0	1	0	0
CS	413	Intro to Combinatorics	3	0	0	2	1	1
CS	417	Computer-Assisted Instruction	4	0	1	0	0	0
CS	418	Computer Graphics	3	2	5	1	0	0
CS	419	Advanced Comp Graphics	3	1	0	0	0	0
CS	420	Intro to Parallel Programming	3	0	0	0	1	0
CS	421	Compilers	3-4	2	0	0	0	0
CS	423	Operating Systems Design	3	0	1	0	0	0
CS	425	Distributed Systems	3-4	1	0	0	0	0
CS	438	Communication Networks	3	1	1	0	0	0
CS	440	Intro Artificial Intelligence	3	1	2	1	0	0
GE	400	Engineering Law	3	3	0	0	0	0
All other 200 and 300 level CS classes								

[1] Recommended Course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	110	Programming Lab (Java)	1	1	2	2	0	0
CS	125	Intro to Computer Science	4	8	6	1	3	0
CS	357	Numerical Analysis	3	1	0	0	0	0
CS	465	Principles of User Interface Design	3-4	1	0	0	0	0
ECE	290	Computer Engineering, I	3	1	1	0	0	0
GE	420	Digital Control (not taken as elective)	4	0	1	0	0	0
GE	393 RSL	RSL Network Design Lab	3	2	0	0	0	0

Student Comments:

All the classes that I took for my secondary field contributed directly toward getting a minor in computer science. I think that it was a worthwhile experience because I learned a lot about computer architecture and programming. This has helped me in my other classes and has directly resulted in me getting a job.

Taking CS as a secondary field of concentration, I personally believe, is not that useful since you are limited to only 12 hours (you're pretty much just touching among the basics and not really gaining much to help you out in the real world) and understanding the field of computer science requires a lot more than 12 hours. It's better to minor in it since you get a lot more choices and an expansion of knowledge and experience.

CS 173 is horrible. A lot of logic involved and a lot of proving and theories. I would suggest taking this class if only want to pursue a minor in this field (it's a requirement). I believe there are other possibilities to replace this class.
CS 125 is Java programming and CS 225 is C++ programming.
CS 125 and 225 are useful in a way they are programming-related. To be warned, both of these classes are extremely fast-paced. Both classes were taught by the same instructor when I took them and I believe will still be in the near future so an advice for taking these classes would be make sure you understand everything from the first day of class. MP's due about every other week and exams consist of writing short methods/functions given a problem statement. Lectures are pretty boring but helpful in a way the instructor goes through sample problems.
I would suggest CS 300 (I heard it's easier) instead of CS 225 if you're not so into CS as actual CS majors.

Secondary Field of Concentration: Construction
Faculty Mentor: W.B. Hall

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	310	Transportation Engineering	3	3	5	1	0	0
CEE	320	Construction Engineering[1]	3	7	8	3	2	2
CEE	380	Geotechnical Engineering	3	4	11	3	0	0
CEE	300	Behavior of Materials	4	1	1	0	0	0
TAM	324	Same as CEE 300						
CEE	420	Construction Productivity[1]	3	7	3	2	0	0
CEE	421	Construction Planning[1]	3	1	1	4	0	0
CEE	422	Construction Cost Analysis[1]	3	2	4	2	1	0
CEE	460	Steel Structures, I[2]	3	1	1	0	0	0
CEE	461	Reinforced Concrete, I	3	4	2	2	0	0
CEE	465	Design of Structural Systems	3	1	0	0	1	0
CEE	498	Special Topics-Methods of Structural A	4	1	0	0	0	0
MSE	406	Thermal-Mech Behavior of Matls	3	0	0	0	0	0
ME	330	Engineering Materials	4	0	0	0	0	0
GE	400	Engineering Law	3	0	0	0	0	0

[1] At least two of these courses must be chosen
[2] Not recommended if GE 410 is chosen as design elective, GE 310 is a prerequisite, do not take CEE
credit is not given for CEE 300 & MSE 280
credit is not given for ME 330 & MSE 280

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	311	Engineering Surveying	4	1	0	0	0	0
CEE	401	Concrete Materials	3	0	1	0	0	0
CEE	469	Wood Structures	3	1	0	0	0	0
CEE	400	Welding & Joining Process	3	1	0	0	0	0
TAM	424	Mechanics of Structural Metals	3	0	1	0	0	0

Student Comments:
(Pre) CEE 320 is not very hard and very informative. Another student claims CEE 320 is very general and boring to no end.
CEE 461 covers material that is interesting. For this class, GE 311 and GE 312 are a good preparation.
CEE 420 is a bit dry.
This secondary field of concentration is rated highly by students. These courses allow students to get involved in either building or facilities construction or to apply their knowledge to project

Secondary Field of Concentration: Control Systems
Faculty Mentor: D. Stipanovic

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	225	Data Structures & Softw Prin[1]	4	0	2	0	0	0
ECE	470	Introduction to Robotics	4	6	1	2	1	0
GE	421	Same as ECE 470						
ME	445	Same as ECE 470						
CS	443	Same as ECE 470						
ECE	486	Control Systems	4	5	7	2	0	0
ECE	490	Introduction to Optimization	3	0	0	0	0	0
CSE	441	Same as ECE 490	3	0	0	0	0	0
GE	422	Robot Dynamics & Control	4	2	1	0	0	0
ECE	489	Same as GE 422						
ME	446	Same as GE 422						
GE	400	Engineering Law	3	0	0	0	0	0
GE	423	Mechatronics	3	0	0	0	0	0
MATH	461	Probability Theory	3	0	1	0	2	1
STAT	451	Same as Math 461	3	0	1	0	2	1
MATH	464	Statistics & Probability II	3	0	0	0	0	0
STAT	410	Same as Math 464	3	0	0	0	0	0
ME	461	Computer Ctrl of Mechanl Sys	3	0	2	1	0	0
ME	360	Signal Proc, Inst and Control	3.5	0	0	1	1	0
ME	460	Industrial Control Systems	4	0	0	0	0	0

[1] recommended only if a prerequisite to another listed course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
AAE	481	Wind Power Technology	3	0	0	1	0	0
GE	420	Digital Control of Dynm System	4	3	3	0	0	0
GE	423	Intro to Mechatronics	3	5	2	0	0	0
GE	420	Digital Control of Dynm System	4	1	1	0	0	0
GE	494	Project Design, I	3	1	0	1	0	0
GE	497	Independent Study	1-4	3	2	0	0	0
GE	541	Engineering Design Project Mgt	4	1	0	0	0	0
ECE	210	Analog Signal Processing	4	0	1	0	0	0
ECE	290/1	Computer Engineering I	3	1	0	0	0	0
ECE	475	Modeling of Bio-Systems	3-4	0	1	0	0	0
MATH	415	Linear Algebra	3	0	2	1	0	0
MATH	444	Elementary Real Analysis	3-4	0	0	1	0	0
MATH	446	Applied Complex Variables	3	0	0	1	0	0
ME	403	Internal Combustions/Engines	3	0	0	0	0	1
NPRE	402	Nuclear Power Engineering	3	0	0	2	0	0

Student Comments:
(Pre) The math courses here aren't that good, but the GE courses are taught with more enthusiasm.
ECE 486 reviews the material in GE 320 and GE 424 but it goes beyond and actually applies it in a lab.
It is recommended that ECE 486 is taken after GE 320.
ECE 470 is a good course. The lab is fun and the subject matter is not too tough.
MATH 461 can be very hard, but the material is very useful for many classes in many subjects.
CS 225 is a lot of work, but it is a good class.
CS 101 is a decent preparation for this course.
GE 320 and 424 provide comprehensive background for this secondary field of concentration.
GE497 (Mechatronics) is a design course as well and has a lot of the learning responsibility placed on the student. I would definitely recommend this class.
The additional exposure of linear algebra in Math 415 is very beneficial, the course however, is much more of a time commitment and is very proof oriented.
GE 423 was an awesome project course that let's you make any robotic system you want.
ME 360 was a waste of time – the majority of the class is review, the rest irrelevant.
Advanced calculus has nothing to do with controls.
ECE486 should be required for control secondary .
The overall quality of this secondary field of concentration is rated well. This secondary has a large emphasis on matrix math and differential equations. The control systems field is expanding fast.

Secondary Field of Concentration: Engineering Administration
Faculty Mentor: R.L. Price

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
Required								
GE	400	Engineering Law	3	10	1	0	0	0
Optional Courses								
ACCY	200	Fundamentals of Accounting	3	4	23	24	14	1
ACCY	201	Accounting and Accountancy, I	3	7	29	15	4	3
ACCY	202	Accounting and Accountancy, II	3	2	9	2	1	1
ADV	300	Introduction to Advertising	3	30	12	14	1	1
BADM	310	Mgmt and Organizational Behavior	3	54	82	41	12	0
BADM	205	Business Location Decisions	3	0	0	5	0	0
GEOG	205	Same as BADM 205						
BADM	303	Principles of Public Policy	3	1	0	0	0	0
PS	321	Same as BADM 303						
ACCY	321	Same as BADM 303						
BADM	311	Individual Behavior in Orgs	3	9	12	2	2	0
BADM	312	Org Design & Environment	3	8	4	3	1	0
BADM	313	Human Resource Management	3	1	2	1	0	0
BADM	375	Business Process Management	3	4	1	5	0	0
BADM	376	Enterprise Proc Integr & Dynm	3	2	1	0	0	0
BADM	380	International Business	3	2	5	1	1	0
BADM	381	Multinational Management	3	0	0	0	0	0
BTW	250	Principles Bus Comm	3	5	9	0	0	0
BTW	261	Principles Tech Comm	3	6	4	1	0	0
FIN	221	Corporate Finance	3	18	33	5	2	1
GE	411	Intro to Reliability Eng	3	3	3	0	0	0
IE	330	Industrial Quality Control	3	1	1	0	0	0
IE	361	Production Planning & Ctrl	3	0	3	2	0	1
IE	420	Financial Engineering	3	0	0	0	0	0
IE	340	Human Factors	4	1	3	5	0	0
AVI	358	Same as IE 340						
PSYC	358	Same as IE 340						
IE	445	Human Perf & Eng Psych	3	0	5	4	1	0
AVI	456	Same as IE 445						
PSYC	456	Same as IE 445						

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ABE	430	Project Management	2	0	0	1	0	0
BADM	320	Principles of Marketing	3	17	23	6	1	1
BADM	395	Senior Research	1-4	0	1	0	0	0
BADM	395	Senior Research	1-4	1	0	0	0	0
BADM	395	Senior Research	1-4	0	0	0	0	1
BADM	323	Marketing Communications	3	0	1	0	0	0
BADM	325	Consumer Behavior	3	2	1	0	0	0
BADM	326	Pricing Policies	3	0	1	0	0	0
CSE	400	Same as CS 400	4	0	0	0	1	0
ECON	202	Economic Statistics I	3	0	0	0	1	0
ECON	420	International Economics	2-4	0	1	0	0	0
ECON	452	The Latin American Economies	2-4	0	1	0	0	0
ECE	316	Engineering Ethics	3	0	0	1	0	0
ECE	428	Distributed Systems	3	0	0	1	0	0
FIN	300	Financial Markets	3	0	1	0	0	0
GE	498	Decision Analysis	1-4	0	2	0	0	0
GE	393 HEC	Evaluation and Planning of New Products	3	0	2	3	2	0
IE	300	Analysis of Data	3	1	4	1	0	0
MSE	450	Intro to Polymer Sci & Eng	3	1	0	0	0	0
TMGT	365	New Product Marketing	3	0	1	0	0	0
TMGT	367	Management of Innovation & Technology	3	1	0	0	0	0

Student Comments: (SP07) BADM310 is a prereq. for a lot of other BADM courses, so you may have to take it to get into what you really wanted. I feel the course has good insights, but it may be too common sensical in most topics- not a necessary course.
BADM375 is good for most anyone interested in a future in management, especially, but not only, if you're interested in manufacturing.
BADM376 is beneficial if you are interested in quality control, six sigma, etc.
ECE316 sounds like something employers would like, but in reality it's a topic that they expect- without taking a class on it. The class is crosslisted as a philosophy course & that is primarily how it is taught.
(S05) ADV 300 is a blow off course, which is good in a way, but you will learn absolutely NOTHING, to the extent that you will feel that you wasted a lot of tuition money.
ADV 300 is easy and a fun class.
ACCY 201 is simple, you need to study for exams.
ADV300 lectures are boring, there is no need to go to class and the assignments are easy.
BA310 exams are are basically memorizing terms.
FIN 221 is too hard and just uses the same principles as all the prerequisites of the class. The material isn't hard, it's just the professor that makes it harder than it should be.
ECON 302 does not teach much, it's pretty boring, but relatively easy.
Overall, the Engineering Administration secondary field of concentration is a good choice for students interested in consulting. This choice of secondary field of concentration will familiarize students with many important aspects of the business world. The combination of engineering and business makes this secondary field of concentration very marketable. This is one of the most popular secondary fields.

Secondary Field of Concentration: Engineering Marketing
Faculty Mentor: D.E. Goldberg

Preapproved Courses

			# Hrs	E	G	F	P	H
Required								
GE	400	Engineering Law	3	1	0	0	0	0
Optional Courses								
ACCY	200	Fundamentals of Accounting	3	4	19	20	13	1
ACCY	201	Accounting and Accountancy, I	3	4	4	7	1	1
ACCY	202	Accounting and Accountancy, II	3	0	0	0	0	0
ADV	300	Introduction to Advertising	3	20	16	4	0	0
BADM	310	Mgmt and Organizational Beh	3	5	23	11	0	0
BADM	320	Principles of Marketing	3	22	32	8	1	0
BADM	322	Marketing Research	3	0	5	4	1	0
BADM	323	Marketing Communications	3	3	2	0	0	0
BADM	325	Consumer Behavior	3	1	4	2	0	0
BADM	327	Marketing to Business & Govt	3	1	1	0	0	0
BADM	352	Database System Design	3	1	0	0	0	0
BADM	382	International Marketing	3	0	0	0	0	0
BADM	420	Advanced Marketing Management	3	0	0	0	0	0
BADM	380	International Business	3	2	2	0	0	0
BTW	250	Principles Bus Comm	3	3	1	1	0	0
BTW	261	Principles Tech Comm	3	8	5	2	0	0
PSYC	245	Industrial Org Psych	3	0	2	2	0	0

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	311	Individual Behavior in Orgs	3	0	0	0	1	0
BADM	312	Org Design & Environment	3	0	1	0	0	0
ECON	101	Introduction to Economics	4	0	1	0	0	0
ECON	103	Macroeconomic Principles	3	0	2	0	0	0
FIN	221	Corporate Finance	3	1	2	2	0	0
GE	497	Independent Study	1-4	0	0	3	0	0
JOUR	200	Introduction to Journalism	3	1	0	0	0	0
IE	300	Analysis of Data	3	0	0	1	0	0

Student Comments. (S04) This secondary field is the reason I got my internship and future job. My employers loved the idea that I was an engineer with marketing and business experience. It matched perfectly to my position as a sales engineer/product management. (S04) For both BA classes, going to class was required and necessary for doing well in the class. Ooops! (F03) ACCY 200 was boring but easy. The questions and problems on the test were almost exactly the same as the stuff on the review done the day before the test. No final required. (Pre) ACCY 201 is an easy class if you don't fall behind. BADM 320 is an "easy A."
BADM 325 has difficult tests. You have to work hard for a B. B&TW 253 is a great class to take junior year. There was a lot of work in this class. BA 311 is not recommended unless you are planning to go into business administration. Choose your classes carefully. Some feel that there are many "flaky" classes that can be avoided with a little research into the course material. B&TW 261 is a great way to get more experience with writing but there isn't much new info. ACCY 201 is boring, and time consuming. ADV 300 is an easy "A". B&TW 250 and 253 are very useful and relevant. BA322 is a very interesting class and you get to use the computer program called SPSS. BA327 was great. There were small class sizes. The job market for this field is very good. Some students consider this field to be similar to business administration. There is a wide range of opportunities in this field especially for those who wish to consult or be more business oriented. This is a good secondary field of concentration if you are interested in engineering sales. ADV 300 is a great class. It is a very interesting class, but is easy and the workload is light.

Secondary Field of Concentration: Environmental Quality
Faculty Mentor: D. Thurston

Preapproved Courses

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ACE	310	Natural Resource Economics	3	0	0	0	0	0
NRES	310	Same as ACE 310						
ENVS	310	Same as ACE 310						
CEE	330	Environmental Engineering	3	9	10	3	0	0
CEE	440	Solid and Hazardous Waste	3	2	0	0	0	0
CEE	430	Ecological Quality Engineering	2	1	0	0	0	0
CEE	431	Biomonitoring	3	0	0	0	0	0
CEE	437	Water Quality Engineering	3	3	4	2	0	0
CEE	442	Env Eng Principles, Physical	3	0	0	0	0	0
CEE	443	Env Eng Principles, Chemical	4	0	0	0	0	0
CEE	444	Env Eng Principles, Biological	3	0	0	0	0	0
CEE	445	Air Quality Modeling	3	1	3	0	0	0
CEE	446	Air Quality Engineering	3	0	1	4	0	0
CEE	432	Stream Ecology	3	0	0	0	0	0
IB	450	Same as CEE432	3	0	0	0	0	0
IB	105	Environmental Biology	3	4	3	3	1	0
IB	485	Environmental Toxicology	3	1	0	0	0	0
CHLH	461	Same as IB 485	3	1	0	0	0	0
ENVS	336	Tomorrow's Environment	3	4	5	3	1	0
CPSC	336	Same as ENVS 336						
CHLH	336	Same as ENVS 336						
ENVS	431	Environmental Toxic Substances	3	1	2	1	0	0
CPSC	435	Same as ENVS 431						
NRES	472	Environmental Psychology	4	0	0	3	0	0
PSYC	472	Same as NRES 472						
GE	400	Engineering Law	3	1	2	0	0	0
NRES	419	Env & Plant Ecosystems	3	0	0	0	0	0
NPRE	241	Intro to Radiation Protection	2	0	0	0	0	0
ENVS	241	Same as NPRE 241						

Petitioned Courses

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
CEE	434	Environmental Systems Modeling	3	0	1	0	0	0
CEE	398FM	Field Methods for Hydrological and Environmental Studies	1-4	0	0	1	0	0
ENVS	210	Environmental Economics	3	0	1	1	0	0
ENVS	447	Environmental Sociology	3	0	1	1	0	0
GE GRN	498	An Entrepreneurial Approach to Green Engineering	3	1	0	0	0	0
MCB	300	Microbiology	3	0	1	0	0	0

Student Comments: (Pre) CEE 330 is a low-keyed class about water and air quality in which the work is not overly difficult. This class helps you determine the areas of environmental engineering that you want to study. CEE 330 is supposed to be an introduction to environmental engineering and the only prerequisite in CHEM 104, but I found it to be a surprisingly challenging class. There was a lot of chemistry and calculus. The topics covered in this class were air pollution, water treatment, and water supply analysis. CEE 430 emphasizes the biological/ ecological perspective of wastewater. CEE 437 is very challenging and it involves a lot of chemistry. It may be boring if you know you don't like the subject material-water quality. CEE 445 has slow and boring lectures, but I have learned about dispersion modeling software used by the EPA.

Secondary Field of Concentration: Manufacturing Engineering

Students fulfilling the College of Engineering minor in Manufacturing Engineering may simultaneously complete the requirements of the secondary field of concentration. Other courses must be chosen

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	400	Engineering Law	3	1	0	0	0	0
ME	330	Engineering Materials	3	0	0	0	0	0
CEE	300	Behavior of Materials	4	0	0	0	0	0
TAM	324	Same as CEE 300						
MSE	280	Engineering Materials	3	0	1	0	0	0
MSE	406	Thermal-Mech Behavior of Matls	3	0	0	0	0	0
GE	423	Mechatronics	3	0	0	0	0	0
ME	431	Mechanical Component Failure	3	0	0	0	0	0
ME	451	Computer-Aided Mfg Systems	3	0	0	1	0	0
ME	452	Num Control of Mfg Processes	3	0	0	0	0	0
ME	498	SK/SK4 Special Topics: EcoDesign and Environmentally Conscious Manufacturing	3 or 4					
ME	445	Introduction to Robotics	4	1	0	0	0	0
AE	482	Same as ME 445						
ECE	470	Same as ME 445						
CS	443	Same as ME 445						
GE	421	Same as ME 445						
ME	446	Robot Dynamics and Control	4	0	0	0	0	0
ECE	489	Same as ME 446						
GE	422	Same as ME 446						
GE	420	Digital Control Systems	4	0	1	0	0	0
ME	487	MEMS-NEMS Theory & Fabrication	4	1	0	0	0	0

[1] At least two of the MFG E courses must be taken

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ARTD	423	Computer Applications I	3	0	0	1	0	0
CEE	320	Construction Engineering	3	0	0	0	1	0
CEE	202	Engineering Risk & Uncertainty	3	0	1	0	0	0
ECE	290	Computer Engineering, I	3	1	0	0	0	0
GE	393YSK	Integrated Engineering and Industrial Design	1-4	2	1	0	0	0
GE	393 JML	Computer Aided Design, Analysis, and Prototyping	0	0	2	0	0	0
GE	498	Leading Sustainable Change		0	1	0	0	0
IE	300	Analysis of Data	3	0	0	1	0	0
IE	330	Industrial Quality Control	3	1	3	0	0	0
IE	340	Human Factors	4	1	1	0	0	0
IE	450	Computer-Aided Mfg Systems	3	0	1	0	0	0
MATH	461	Probability Theory I	3	1	1	1	0	0
MSE	450	Intro to Polymer Sci & Eng	3	1	0	0	0	0
ME	350	Design for Manufacturability	3	6	1	2	0	0
ME	460	Industrial Control Systems	4	1	1	0	0	0
ME	497	Independent Study	1-4	3	0	0	0	0

Secondary Field of Concentration: Nondestructive Testing and Evaluation
Faculty Mentor: H.L.M dos Reis

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	300	Behavior of Materials[3]	4	0	0	1	0	0
TAM	324	Same as CEE 300						
CS	225	Data Structures & Softw Prin[1]	4	0	0	0	0	0
CS	446	Machine Learning & Pattern Rec	3	0	0	0	0	0
CS	440	Intro Artificial Intelligence	3	0	0	0	0	0
ECE	448	Same as CS 440						
TAM	413	Same as ECE 473	3	0	0	0	0	0
GE	411	Intro to Reliability Eng[3]	3	0	1	0	0	0
IE	435	Same as GE 411						
GE	412	Fund of Nondestructive Eval[2]	3-4	0	1	0	1	0
GE	400	Engineering Law	3	0	0	0	0	0
GE	422	Robot Dynamics & Control	4	0	0	0	0	0
ME	446	Same as GE 422						
ECE	489	Same as GE 422						
ECE	470	Introduction to Robotics	4	0	0	0	0	0
GE	421	Same as ECE 470						
ME	445	Same as ECE 470						
CS	443	Same as ECE 470						
ME	350	Design for Manufacturability	3	0	0	0	0	0
ME	471	Intro to Finite Element Anlys	3-4	0	0	0	0	0
CSE	451	Same as ME 471						
AE	420	Same as ME 471						
TAM	412	Intermediate Dynamics	4	0	0	0	0	0
TAM	456	Experimental Stress Analysis	3	0	0	0	0	0

[1] Recommended only if it is a prerequisite to another listed course

[2] Required Course

[3] Recommended Course

credit is not given for CEE 300 & MSE 280 or MSE 406 Thermal-Mech Behavior Matls, or ME 330 Engineering Materials

credit is not given for ME 330 & MSE 280

Student Comments: (Pre) CEE 300 is a good structures class, but two instructors teach it so the test formats vary a great deal. It is also a Comp II class, so there is a lot of writing. GE 411 can be taken even if you have never had a statistics class.

Secondary Field of Concentration: Operations Research
Faculty Mentor: A. Abbas

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	411	Intro to Reliability Eng	3	0	5	0	0	0
IE	435	Same as GE 411						
GE	400	Engineering Law	3	2	0	0	0	0
IE	360	Facilities Planning & Design	3	1	3	1	1	1
IE	361	Production Planning & Ctrl	3	0	3	2	0	0
ME	451	Computer-Aided Mfg Systems	3	0	0	0	0	0
MATH	461	Probability Theory I	3-4	1	1	3	0	0
STAT	451	Same as MATH 461						
MATH	464	Statistics & Probability II	3	0	0	0	0	0
STAT	410	Same as MATH 464						
ME	350	Design for Manufacturability	3	0	0	0	0	0

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	393 WJD	Design and Management of Manufacturing Systems	1-4	0	1	0	0	0
IE	300	Analysis of Data	3	5	0	0	0	0
IE	410	Stochastic Processes and Applications	3-4	0	0	1	0	0
IE	412	OR Models of Mfg Systems	3	0	1	1	0	0
IE	413	Simulation	3	0	1	0	0	0
IE	430	Economic Found of Quality Sys	3	2	0	0	0	0
MATH	484	Non-Linear Programming	3	1	0	0	0	0

Student Comments: (Pre) IE 300 very useful if planning to take any other statistic courses. GE 411 is a very interesting and helpful course and is taught very well. This field is interesting but is seems as if there is not really enough time to become involved in the field and get a good feel for it. IE 430 is a great course for people interested in product development and manufacturing. The course material for MFG E 450 is excellent and awesome.

Secondary Field of Concentration: Quality Control
Faculty Mentor: H. Kim

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	400	Engineering Law	3	0	0	0	0	0
BADM	376	Enterprise Proc Integr & Dynm	3	0	0	0	0	0
GE	411	Intro to Reliability Eng	3	4	1	0	0	0
IE	435	Same as GE 411						
GE	412	Fund of Nondestructive Eval	3-4	1	0	0	0	0
IE	330	Industrial Quality Control	3	1	0	1	0	0
IE	361	Production Planning & Ctrl	3	0	0	0	1	1
IE	400	Des and Anlys of Experiments	3	2	0	1	0	0
MATH	461	Probability Theory I	3-4	0	0	0	0	0
STAT	451	Same as MATH 461						
MATH	464	Statistics & Probability II	3	0	0	0	0	0
STAT	410	Same as MATH 464						
ME	350	Design for Manufacturability	3	0	3	0	0	0

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	493 HEC	Design for Six Sigma	4	1	0	0	0	0
IE	430	Economic Found of Quality Sys	3	1	0	0	0	0
CS	225	Data Structures and Software Principles	4	0	0	1	0	0

Student Comments:(Pre) GE 413 is another class one can take to compliment the quality control coursework. IE 361 is a waste of time. IE 330 moves very slowly; if you understand GE 331 well you shouldn't waste your time with this course. IE 400 is a good course – If your secondary is Quality Control you should understand Design of Experiments.
IE 330 teaches very useful knowledge of quality control. IE 400 is challenging, you should take IE 330 first to get the concept down.

Secondary Field of Concentration: Rehabilitation Engineering

Faculty Mentor: M. Moeinzadeh

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
MCB	150	Molec and Cellular Basis of Life[1]	4	1	0	0	0	0
MCB	250	Molecular Genetics[1]	4	0	0	0	0	0
MCB	251	Exp Technigs in Molecular Biol[1]	2	0	0	0	0	0
MCB	334	Functional Human Anatomy	5	2	0	0	0	0
CHEM	232	Elementary Organic Chemistry I	3	0	0	1	0	0
ECE	414	Biomedical Instrumentation	3	0	0	0	1	0
BIOE	414	Same as ECE 414						
ECE	415	Biomedical Instrumentation Lab	2	0	0	0	0	0
BIOE	415	Same as ECE 415						
GE	400	Engineering Law	3	0	0	0	0	0
MCB	103/104	Intro to Human Physiology	4	3	2	0	0	0
REHB	401	Intro to Rehabilitation	4	0	2	1	0	0
REHB	402	Medical Aspects of Disabilities	4	1	0	0	0	0
REHB	440	Sensory Impairments	4	1	0	0	0	0
REHB	444	Adaptive Technologies	4	0	0	0	0	0

[1] recommended only if a prerequisite to another listed course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BIOE	120	Introduction to Bioengineering	1	0	1	0	0	0
GE	397	Independent Study	0-4	1	0	0	0	0
GE	497	Independent Study	1-4	0	1	2	0	0

Student Comment:

(S04) Rehab is a great secondary field! I chose it because I was interested in sportsmedicine and kinesiology, and I wanted to find a way to relate that to engineering. I would recommend choosing this as your secondary field because its so interesting and different from our engineering classes. And you're not locked into a career in rehab - basically you get to learn about how humans function. Human Anatomy was fascinating. In lab we looked at cadavers and you can see all of the muscles, nerves, arteries, etc. It requires a lot of memorizing.

(F03) MCB 103/104 was a fun class. The professor was great and labs were like a social time because we worked in huge groups and did a lot of experiments on ourselves.

(Pre) BIOEN 120 is a great way to learn about different areas of bioengineering. GE 397 is a great class to actually apply engineering skills. You learn more in GE 397 than in other 3 years of courses. GE 497 has a lot of material to comprehend; it would help to have some background in anatomy. REHAB 401 goes on many field trips to rehab centers. REHAB 440 has many guest speakers who are

Secondary Field of Concentration: Robotics
Faculty Mentor: D. Stipanovic

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	225	Data Structures & Softw Prin[1]	4	2	0	0	0	0
CS	446	Machine Learning & Pattern Rec	3	0	0	0	1	0
CS	440	Intro Artificial Intelligence	3	0	0	0	1	1
ECE	448	Same as CS 440						
CS	475	Formal Models of Computation	3	0	0	0	0	0
MATH	475	Same as CS 475						
ECE	390	Computer Engineering, II	3	0	1	0	0	0
ECE	475	Modeling of Bio-Systems	3-4	0	0	0	0	0
BIOE	475	Same as ECE 475						
ECE	486	Control Systems	4	0	1	0	0	0
CSE	441	Same as ECE 490	3	0	0	0	0	0
GE	411	Intro to Reliability Eng	3	0	0	0	0	0
IE	435	Same as GE 411						
ECE	470	Introduction to Robotics	4	2	0	0	2	0
GE	421	Same as ECE 470						
ME	445	Same as ECE 470						
CS	443	Same as ECE 470						
GE	400	Engineering Law	3	2	0	0	0	0
GE	422	Robot Dynamics & Control	4	2	2	0	0	0
ME	446	Same as GE 422						
ECE	489	Same as GE 422						
ME	350	Design for Manufacturability	3	1	1	0	0	0
ME	461	Computer Ctrl of Mechanl Sys	3	0	0	0	0	0
GE	423	Introduction to Mechatronics	3	1	0	1	1	0

[1] recommended only if a prerequisite to another listed course

Petitioned Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	400	Intro to Data Structures, Non-CS Majo	4	0	1	0	0	0
GE	420	Digital Control of Dynm System	4	3	1	1	0	0
GE	393RSL	Special Problems in Robotics	1-4	0	0	1	0	0

Student Comment: (Pre) Students should be aware that they would have to wait to their senior year to get classes that relate to robotics
CS 440 and 446 were disorganized

Secondary Field of Concentration: Theoretical and Applied Mechanics
Faculty Mentor: H. Reis

Preapproved Courses

			# Hrs	Excellent	Good	Fair	Poor	Horrible
TAM	324	Same as CEE 300	4	2	0	0	0	0
CEE	300	Behavior of Materials						
ME	471	Intro to Finite Element Anlys	4	0	0	0	0	0
CSE	451	Same as ME 471						
AE	420	Same as ME 471						
TAM	412	Intermediate Dynamics	4	0	0	1	0	0
T A M	451	Intermediate Solid Mechanics	4	1	1	1	0	0
TAM	424	Mechanics of Structural Metals	3	0	2	0	0	0
TAM	456	Experimental Stress Analysis	3	1	0	0	0	0
TAM	428	Mechanics of Composites	3	1	2	0	0	0
AE	428	Same as TAM 428						
MSE	456	Same as TAM 428						
TAM	427	Mechanics of Polymers	3	1	0	0	0	0
AE	427	Same as TAM 427						
MSE	454	Same as TAM 427						
TAM	435	Intermediate Fluid Mechanics	4	1	0	1	0	0
TAM	445	Continuum Mechanics	4	1	0	0	0	0
MSE	406	Thermal-Mech Behavior of Matls	3	0	0	0	0	0
ME	330	Engineering Materials	4	0	0	0	0	0
GE	400	Engineering Law	3	0	0	0	0	0

Student Comment: TAM451- shares some material with required GE courses.
All courses involved advanced/difficult mat, small classes, informal atmosphere.

Customized Secondary Fields of Concentration

Note: Petition required for ALL courses in Option 4 and 5.

Some fields listed here may not have all required courses for the secondary field.

A full 12 hours is necessary to complete the requirement.

Secondary Field of Concentration: Acoustics (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	473	Fund of Engrg Acoustics	3	1	0	0	0	0
ECE	545	Advanced Physical Acoustics	4	0	1	0	0	0
MUS	103	Rudiments of Theory I	3	1	1	0	0	0
MUS	402	Musical Acoustics	3	1	0	0	0	0
SHS	240	Intro Sound & Hearing Science	3	0	1	1	0	0

Student Comments:
(Pre) ECE 473 is the foundation course for acoustics.
MUSIC 402 deals with the acoustics of strings, drums, etc.
MUSIC 103 deals with music theory and analysis.
There are lots of great demonstrations in MUSIC 402.
SPSHS 240 reviews basic acoustics and auditory theory/ physiology.
In general, the acoustic secondary field of concentration is very specific. It is interesting and not exactly what one would think “acoustics” would encompass.

Secondary Field of Concentration: Aeronautical and Astronautical Engineering (option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
AAE	312	Compressible Flow	3	0	1	0	0	0
AAE	302	Aerospace Flight Mechanics	3	1	0	0	0	0
AAE	433	Aerospace Propulsion	3	0	0	1	0	0
AAE	352	Aerospace Dynamics	3	1	0	0	0	0

Secondary Field of Concentration: Applied Controls (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ME	441	Automotive Vehicle Dynamics	3-4	0	1	0	0	0
ME	442	Automotive Vehicle Dynamics	3-5	1	2	1	1	1
ME	443	Automotive Vehicle Dynamics	3-6	2	3	2	2	2

Secondary Field of Concentration: Applied Statistics (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
STAT	200	Statistical Analysis	3	0	1	0	0	0
STAT	201	Statistical Analysis	4	1	2	1	1	1
STAT	202	Statistical Analysis	5	2	3	2	2	2

Secondary Field of Concentration: Audio Engineering (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	210	Analog Signal Processing	4	0	2	0	0	0
ECE	290	Computer Engineering, I	3	0	0	0	1	0
ECE	403	Audio Engineering	3	1	1	0	0	0
ECE	410	Digital Signal Processing, I	4	1	1	3	0	0
ECE	473	Fund of Engrg Acoustics	3	1	1	1	0	0
MUS	103	Rudiments of Theory I	3	0	1	0	0	0
THEA	453	Theater Sound Technology	3	0	0	0	0	1
THEA	454	Theater Sound Design	3	0	0	0	0	1
MUS	103	Rudiments of Theory I	3	0	0	1	0	0
PHYS	498	Independent Study	1-4	0	0	0	0	1

Secondary Field of Concentration: Aviation (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
AVI	101	Private Pilot, I	3	5	0	0	0	0
AVI	120	Private Pilot, II	3	5	1	0	0	0
AVI	130	Commercial - Instrument, I	3	5	0	0	0	0
AVI	140	Commercial - Instrument, II	3	4	0	0	0	0
AVI	320	Flight Instructor – Airplane	3	1	1	0	0	0
AVI	322	Instrument Flight Instructor	1	0	1	0	0	0
AVI	350	Practice Teaching – Airplane	3	0	1	0	0	0
AVI	381	Cockpit Resource Management	3	1	0	0	0	0
AVI	455	Aviation Accident Investigation	3	0	1	0	0	0
AVI	456	Same as IE 445	3	0	0	1	0	0
IE	340	Human Factors	4	0	0	1	0	0
AVI	200	Commercial Pilot I	4	1	0	0	0	0
AVI	184	Aviation Weather	3	1	0	0	0	0
AVI	210	Commercial Pilot II	4	1	0	0	0	0

Student Comments: (Pre) AVI 140 is required for completion of instrument requirements. Great
All aviation classes are fun but are not for everyone. You have to be self-motivated to

Secondary Field of Concentration: Biology (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
MCB	150	Molec and Cellular Basis of Life[1]	4	0	0	0	0	0
MCB	250	Molecular Genetics[1]	4	0	0	0	0	0
MCB	251	Exp Technigs in Molecular Biol[1]	2	0	0	0	0	0
CHEM	232	Elementary Organic Chemistry I	3	0	1	0	0	1
CHEM	233	Elementary Organic Chem Lab I	2	1	0	1	0	0
ECE	280	Biomedical Imaging	3	1	0	0	0	0
IB	104	Animal Biology	4	0	1	0	0	0
IB	105	Environmental Biology	3	1	0	0	0	0
MCB	401	Cell & Membrane Physiology	3	0	0	0	0	1

Student Comments: (Pre) Ideal for GE students who are also thinking about going to med school

Secondary Field of Concentration: Biomechanics (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
MCB	334	Functional Human Anatomy	2	0	1	0	0	0
KIN	355	Biomechanics of Human Movement	3	1	0	1	0	0
MCB	103	Intro to Human Physiology	4	0	1	1	0	0
BIOE	120	Intro to Bioengineering	1	0	0	1	0	0

Student Comments: (Pre) KINES 355 is very easy. MCB 334 was a ton of work, very time

Secondary Field of Concentration: Business Administration (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	310	Mgmt and Organizational Beh	3	1	0	1	0	0
BADM	311	Individual Behavior in Orgs	3	0	1	0	0	0
BTW	261	Principles Tech Comm	3	2	0	0	0	0
IE	340	Human Factors	4	0	0	1	0	0

Secondary Field of Concentration: Business Law (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
PHIL	102	Logic & Reasoning	3	0	1	0	0	0
BADM	300	Business Law	3	1	0	0	0	0
BADM	310	Management & Organizational Behavi	3	0	1	0	0	0
BTW	250	Principles Business Communication	3	0	0	0	0	1

Secondary Field of Concentration: Business and Network Consulting (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	320	Principles of Marketing	3	0	1	0	0	0
BADM	310	Mgmt and Organizational Beh	3	0	1	0	0	0
CS	110	Programming Lab (Java)	1	0	0	1	0	0
GE	393RSL	RSL Networking Design Lab	3	1	0	0	0	0

Secondary Field of Concentration: Business and Technical Writing (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
BTW	250	Principles Bus Comm	3	1	1	0	0	0
BTW	271	Persuasive Writing	3	0	1	0	0	0
BTW	272	Report Writing	3	1	1	0	0	0

Student Comments: (Pre) For this field you must enjoy writing and want to learn the basics. This is a

Secondary Field of Concentration: Chinese (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CHIN	201	Elementary Chinese I	5	1	0	0	0	0
CHIN	202	Elementary Chinese II	5	1	0	0	0	0
CHIN	203	Intermediate Chinese I	5	1	0	0	0	0
CHIN	204	Intermediate Chinese II	5	1	0	0	0	0

Secondary Field of Concentration: Chemical Engineering (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CHBE	221	Principles of CHE	3	0	2	0	0	0
CHBE	222	Principles of CHE	4	1	2	1	1	1
CHBE	223	Principles of CHE	5	2	3	2	2	2

Student Comments: (Pre) CH E 422 is a very design oriented course with much time needed. The

Secondary Field of Concentration: Chemistry (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CHEM	232	Elementary Organic Chemistry I	3	1	0	1	0	0
CHEM	233	Elementary Organic Chem Lab I	2	0	0	1	0	0
CHEM	332	Elementary Organic Chemistry II	3	1	0	0	0	0
CHEM	442	Physical Chemistry I	4	0	0	1	0	0
CHEM	494	Laboratory Safety Fundamentals	1	0	0	1	0	0
MCB	450	Intro Biochemistry	3	1	0	0	0	0

Secondary Field of Concentration: Communication Systems Design (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	459	Communications, I	3	0	1	0	0	0
CS	400	Data Structures	4	1	0	0	0	0
CS	498	Independent Study	0-4	0	0	1	0	0
CS	491	Special Topics	0-4	0	0	1	0	0
GE	424	Intro to Mechatronics	3	0	1	0	0	0
GE	393 RSL	Networking Design Lab	3	0	1	0	0	0

Secondary Field of Concentration: Computational Nondestructive Evaluation (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	173	Discrete Structures	3	0	1	0	0	0
CS	400	Data Structures, Non-CS Majors	4	0	1	0	0	0
GE	412	Fund of Nondestructive Eval	3-4	0	1	0	0	0

Secondary Field of Concentration: Computer Applications in Consulting (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	395	Senior Research	1-4	0	2	0	0	0
CS	400	Data Structures, Non-CS Majors	4	0	1	0	0	0
GE	497	Independent Study	1-4	3	4	5	1	0

Secondary Field of Concentration: Computer Graphics (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CS	110	Programming Lab (Java)	1	0	0	0	1	0
CS	400	Data Structures, Non-CS Majors	4	0	1	0	0	0
CS	418	Computer Graphics	3	1	0	0	0	0

Secondary Field of Concentration: Computer Integrated Product Engineering (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ME	350	Design for Manufacturability	3	1	0	0	0	0
GE	393 YSK	CAD/CAM and Solid Modeling	1-4	0	0	1	0	0

Student Comments: (Pre) ME 350 is a great survey of Design for Manufacturability, CAD/CAM, and

Secondary Field of Concentration: Educational Communication (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
EPS	201	Fundamanetals of Education	3	0	0	1	0	0
MATH	402	Non-Euclidean Geometry	3	0	1	0	0	0
SPC	101	Public Speaking	3	1	0	0	0	0
SPC	323	Argumentation	3	1	0	0	0	0

Student Comments: (SP07) At first I was going to do Education, but when I chose to go to law

Secondary Field of Concentration: Finite Element Analysis (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
CS	450	Intro to Numerical Analysis	3-4	1	0	0	0	0
ME	471	Intro to Finite Element Analysis	3-4	1	0	1	0	0
TAM	412	Intermediate Dynamics	4	0	1	0	0	0
TAM	428	Mechanics of Composites	3	0	1	0	0	0
TAM	451	Intermediate Solid Mechanics	4	0	1	0	0	0

Secondary Field of Concentration: Economics (Option 4)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ECON	302	Inter Microeconomic Theory	3	1	3	0	0	0
ECON	303	Inter Macroeconomic Theory	3	1	3	0	0	0
ECON	420	International Economics	3	2	0	0	0	0
ECON	421	Cont Issues in Intl Econ	3	2	0	0	0	0
ECON	452	The Latin American Economies	3	2	0	0	0	0
ECON	483	Econ of Innovation and Tech	3	1	0	0	0	0
BADM	320	Principles of Marketing	3	0	1	0	0	0
BADM	310	Management and Organizational Behavior	3	1	0	0	0	0
ECON	202	Economic Statistics I	3	1	1	1	0	0
ECON	203	Economic Statistics II	3	2	1	0	0	0

Secondary Field of Concentration: Electrical and Computer Engineering (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	210	Analog Signal Processing	4	0	1	1	0	0
ECE	290	Computer Engineering, I	3	0	1	0	1	1
ECE	390	Computer Engineering, II	3	1	1	0	0	0
ECE	307	Techniques for Engineering Decisions	3	0	1	0	0	0
ECE	410	Digital Signal Processing I	4	0	0	0	1	0
ECE	411	Comp Organization & Design	4	0	1	0	0	0

Student Comments: ECE 290 is lots of work. ECE 390 is extremely interesting, the final project is a

Secondary Field of Concentration: Electromechanics (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	329	Intro Electromagnetic Fields	3	1	0	0	0	0
ECE	430	Power Ckts & Electromechanics	1	1	0	0	0	0
ME	400	Energy Conversion Systems	3	0	0	1	0	0
ME	403	Internal Combustions/Engines	3	0	1	0	0	0

Student Comments: (Pre) ECE 329 is not an easy class, but it is fundamental to the rest of the

Secondary Field of Concentration: English (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ENGL	442	British Lit Since 1930	3	1	0	0	0	0
ENGL	245	The Short Story	3	0	1	0	0	0
ENGL	251	The American Novel Since 1914	3	1	0	0	0	0

Student Comments: (Pre) ENGL as a SFC kept me well-rounded and maintained my writing skills.

Secondary Field of Concentration: Entrepreneurship (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ABE	430	Project Management		0	0	0	0	0
ACCY	200	Fundamentals of Accounting	3	1	0	0	0	0
ADV	300	Intro to Advertising	3	1	0	0	0	0
BADM	310	Management and Organizational Behavior	3	0	1	2	0	0
BADM	335	Introduction to Supply Chain Management	3	0	0	1	0	0
CS	173	Discrete Structures	3	0	0	0	0	1
FIN	221	Corporate Finance	3	0	0	1	0	0
GE	398	Lectures in Entrepreneurship	1	0	1	0	0	0
GE	461	Technology Entrepreneurship	3	1	0	0	0	0
GE	498	Independent Study	1-4	4	0	0	0	0
IE	300	Analysis of Data	3	0	1	0	0	0
CS	231	Computer Architecture I	3	0	0	1	0	0
ME	350	Design for Manufacturability	3	0	0	1	0	0

Secondary Field of Concentration: Environmentally Conscious Manufacturing Engineering (5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	330	Environmental Engineering	3	1	1	0	0	0
CHEM	104	General Chemistry II	4	0	1	0	0	0
ME	330	Engineering Materials	4	0	1	0	0	0

Secondary Field of Concentration: Film and Media Studies (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ENGL	104	Intro to Film Studies	3	1	0	0	0	0
ENGL	273	Intermediate Film Studies	3	1	0	0	0	0
ARTS	442	Moving Image I	3-4	1	0	0	0	0
ARTS	443	Moving Image II	3-4	1	0	0	0	0

Secondary Field of Concentration: Finance (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ACCY	201	Accounting and Accountancy, I	3	3	2	2	0	0
ACCY	202	Accounting and Accountancy, II	3	2	2	0	0	0
BADM	320	Principles of Marketing	3	2	2	0	0	0
BADM	310	Mgmt and Organizational Beh	3	36	36	20	8	0
FIN	221	Corporate Finance	3	8	4	1	0	0
FIN	300	Financial Markets	3	4	1	1	0	1
FIN	311	Investments	3	1	1	0	0	0
FIN	321	Advanced Corporate Finance	3	0	0	1	0	0
FIN	412	Options and Futures Markets	3	1	2	0	0	0

Student Comments: (Pre) Great to see a truly different side of the engineering world.
FIN 300 is an unorganized course

Secondary Field of Concentration: Financial Engineering (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECON	202	Economic Statistics I	3	0	0	0	0	1
ECON	203	Economic Statistics II	3	0	0	0	0	1
GE	397	Independent Study	NA	1	0	0	0	0
IE	?	Independent Study	NA	1	0	0	0	0
IE	221	Corporate Finance	3	0	0	0	1	0

Student Comments: ECON 202 and 203 are to be avoided. Exams have multiple correct answers.

Secondary Field of Concentration: French (Option 4)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ECON	332	European Economic History	3	0	0	2	0	0
FR	133	Accel Intermediate French I	4	0	1	0	0	0
FR	134	Accel Intermed French II	4	1	0	0	0	0
FR	199	Undergraduate Open Seminar	1-5	0	0	1	0	0
FR	205	Oral French	2	2	0	0	0	0
FR	209	Intro to French Lit I	3	1	1	1	0	0

Student Comments: (Pre) This secondary field takes more planning than most but is definitely worth

Secondary Field of Concentration: Geography (Option 4)

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
GEOG	403	Landform Studies	4	0	0	1	0	0
GEOG	405	Zoogeography	3	0	1	0	0	0
GEOG	415	Physical Climatology	3	1	0	0	0	0

Secondary Field of Concentration: Geology (Option 5)

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
GEOL	104	Geology of the National Parks	3	1	0	0	0	0
GEOL	107	Physical Geology	4	1	0	0	0	0
GEOL	108	Historical Geology	4	0	1	0	0	0
GEOL	470	Introduction to Hydrogeology	4	0	1	0	0	0

Student Comments:(Pre) GEOL 104 is not counted for the secondary field of concentration but is a

Secondary Field of Concentration: German (Option 4)

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
GER	211	Conversations and Writing I	3	0	1	0	0	0
GER	212	Conversations and Writing I	4	1	2	1	1	1
GER	213	Conversations and Writing I	5	2	3	2	2	2
GER	214	Conversations and Writing I	6	3	4	3	3	3
GER	215	Conversations and Writing I	7	4	5	4	4	4

Student Comments: (Pre) GER 420 has lots of reading but is a very interesting course. It spans all

Secondary Field of Concentration: Global Manufacturing (Option 5)

			# Hrs	Excellen t	Good	Fair	Poor	Horrible
MFGE	310	Intro to Mfg		0	1	0	0	0
PS	280	Into to Intnl Relations	3	0	0	1	0	0
IE	430	Economic Found of Quality Systems	3	0	0	0	1	0

Secondary Field of Concentration: History of Engineering, Science and Technology (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
HIST	364	Technology in Western Society	3	0	1	0	0	0
HIST	265	Science in Western Civ I	3	1	1	0	0	0
HIST	266	Science in Western Civ II	3	2	1	0	0	0
HIST	363	Scientific Thought I	3	0	0	2	0	0
PHIL	317	Same as HIST 363						
PHYS	419	Space, Time, & Matter	3	1	1	0	0	0

Student Comments: (Pre) Physics 419 is hard but very interesting. HIST 364 is a decent review of

Secondary Field of Concentration: Hydraulics (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	451	Environmental Fluid Mechanics	3	1	0	0	0	0

Secondary Field of Concentration: Industrial Design (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ARTF	199	Undergraduate Open Seminar	1 to 5	0	1	0	0	0
ARTD	220	Design Workshop I	3	2	1	1	0	0
ARTD	222	Design Workshop, II	3	1	1	1	0	0
ARTD	221	Model Making, I	3	3	0	1	0	0
ARTD	391	Special Problems in Design	1-4	1	0	1	0	0
ARTD	421	Professional Practices	2	1	0	0	0	0
ARTD	423	Computer Applications I	3	1	1	0	0	0
PSYC	358	Same as IE 340	4	0	0	0	1	0

Secondary Field of Concentration: IE - Human Factors and Ergonomics (Option 4)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ARTD	391	Special Problems in Design	1-4	1	0	0	0	0
AVI	197	Independent Study	2	1	0	0	0	0
AVI	447	Human Error	3	1	0	0	0	0
IE	300	Analysis of Data	3	0	0	1	0	0
IE	340	Human Factors	4	8	3	0	0	0
IE	445	Human Perf & Eng Psych	3	2	3	0	1	0
PSYC	456							
IE	446	Human-Comp Interaction Lab	4	0	1	0	0	0
IE	497	Independent Study	1-4	2	0	0	0	0
IE	540	Analys and Des of Man-Mach Sys	4	0	1	0	0	0
IE	541	Mental Models in Complex Sys	4	0	1	0	0	0
MATH	461	Probability Theory I	3-4	0	0	1	0	0
ME	350	Design for Manufacturability	3	1	0	0	0	0
ME	497	Independent Study	1-4	1	0	0	0	0
PSYC	100	Intro Psych	4	0	1	0	0	0
PSYC	216	Child Psych	3	0	0	1	0	0
PSYC	245	Industrial Org Psych	3	0	0	1	0	0
PSYC	358	Human Factors	4	0	0	1	0	0

Secondary Field of Concentration: Human Factors (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
KIN	257	Coordination, Control, and Skill	3	1	0	0	0	0
KIN	262	Motor Development, Growth, and Form	3	0	1	0	0	0
KIN	385	Kinesiology Research – Biomechanics & Motor Control	3	1	0	0	0	0
PSYC	358	Human Factors	4	0	1	0	0	0

Secondary Field of Concentration: International Business (Option 4)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ACCY	201	Accounting and Accountancy, I	3	0	1	0	0	0
BADM	380	International Business	3	1	0	0	0	0
ECON	332	European Economic History	3	0	1	0	0	0
ECON	420	International Economics	3	0	1	1	0	0

Student Comments: (Pre) ECON was kind of lame since the professor was difficult to understand,

Secondary Field of Concentration: International Marketing (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
BADM	320	Principles of Marketing	3	3	1	0	0	0
BADM	310	Mgmt and Organizational Beh	3	0	1	0	0	0
BADM	322	Marketing Research	3	4	1	0	0	0
BADM	325	Consumer Behavior	3	0	2	0	0	0
FIN	221	Corporate Finance	3	0	1	0	0	0
ENG	299 A	Engineering Study Abroad – Culture		2	0	0	0	0
ADV	300	Intro to Advertising	3	0	2	0	0	0

Student Comments: (S04) BADM 322 was really great because it is very project based and you get a (S04) BADM 325 – Lan Nguyen is a tougher teacher (of the two that taught the course my semester),

Secondary Field of Concentration: Italian (Option 4)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
ITAL	101	Elementary Italian I	4	1	0	0	0	0
ITAL	102	Elementary Italian II	4	0	0	1	0	0
ITAL	103	Intermediate Italian I	4	1	0	0	0	0
ITAL	390	Enemies of Democracy	3	1	0	0	0	0
PS	280	International Relations	3	1	0	0	0	0
NPRE	201	Energy Systems	2 or 3	0	1	0	0	0

Student Comments: (SP07) These 6 used for International Minor- Italian. Ital 101, 102, 103 are all

Secondary Field of Concentration: Japanese (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
EALC	250	Intro to Japanese Culture	3	1	0	0	0	0
EALC	305	Japanese Lit. in Translation	3	0	0	0	0	0
ECON	351	Economic Development in Japan	3	0	1	0	0	0
HIST	227	Modern Japanese History	3	0	1	0	0	0
JAPN	201	Elementary Japanese I	5	1	1	0	0	0
JAPN	202	Elementary Japanese II	5	1	2	0	0	0
JAPN	203	Intermediate Japanese I	5	3	1	0	0	0
JAPN	204	Intermediate Japanese II	5	3	0	1	0	0
JAPN	306	Advanced Japanese II	5	1	1	0	0	0

Student Comments: (Pre) Most of ECON 351 covers unique characteristics of the Japanese

Secondary Field of Concentration: Leadership Studies (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
AGED	260	Intro to Leadership Studies	3	1	0	0	0	0
BADM	310	Management and Organizational Beha	3	0	1	0	0	0
GE	361	Emotional Intelligence	3	0	1	0	0	0

Secondary Field of Concentration: Mathematics (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
MATH	380	Advanced Calculus	3	1	2	1	0	0
MATH	402	Non Euclidean Geometry	3	3	0	1	0	0
MATH	415	Linear Algebra	3	0	1	0	0	0
MATH	461	Probability Theory I	3	1	0	0	0	0
MATH	482	Linear Programming	3-4	0	1	1	0	0
MATH	484	Nonlinear Programming	3	1	0	0	0	0
MATH	347	Fundamental Mathematics	3	0	1	1	0	0
MATH	413	Intro to Combinatorics	3-4	0	0	0	1	0

Student Comments: (Pre) MATH 380 is an excellent course for those seeking more that just the

Secondary Field of Concentration: Mechanical Design (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	393YSK	Integrated Engineering and Industrial Design	1-4	1	0	0	0	0
ME	330	Engineering Materials	4	0	1	0	0	0
ME	350	Design for Manufacturability	3	1	0	0	0	0
ME	497	Independent Study:Special Problems: Team Development Skills	1-4	1	0	0	0	0

Student Comments: (Pre) GE 497 introduces different drawing and modeling techniques. It also

Secondary Field of Concentration: Meteorology (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ATMS	120	Severe and Hazardous Weather	3	1	0	0	0	0
ATMS	300	Weather Processes	3	0	0	1	0	0
ATMS	401	Atmospheric Physics	4	0	0	1	0	0
ATMS	421	Earth Systems Modeling	4	0	1	0	0	0

Secondary Field of Concentration: Music and Hearing Science (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
MUS	103	Rudiments of Theory I	3	1	0	0	0	0
MUS	104	Rudiments of Theory II	3	1	0	0	0	0
PSYC	230	Perception & Sensory Processes	3	0	0	1	0	0
SHS	240	Intro Sound & Hearing Science	3	0	1	0	0	0

Secondary Field of Concentration: Organic Chemistry (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CHEM	104	General Chemistry II	3	1	0	0	0	0
CHEM	232	Elementary Organic Chemistry I	3	0	1	0	0	0
CHEM	233	Elementary Organic Chem Lab I	2	1	0	0	0	0
CHEM	332	Elementary Organic Chem II	3	0	0	1	0	0

Secondary Field of Concentration: Organizational Behavior (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ADV	300	Introduction to Advertising	3	1	0	0	0	0
IE	340	Human Factors	4	1	0	0	0	0
IE	445	Engineering Psychology	4	0	0	0	0	0
BADM	?	Fundamentals of Management	3	1	0	0	0	0

Secondary Field of Concentration: Political Science (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
PS	201	U.S. Racial and Ethnic Politics	3	0	1	0	0	0
PS	220	Intro to Public Policy	3	1	0	0	0	0
PS	270	Intro to Political Theory	3	0	1	0	0	0
PS	280	Intro to International Relations	3	0	0	1	0	0
PS	230	Intro to Pol Research	3	0	1	1	0	0
PS	301	U.S. Constitution I	3	1	0	0	0	0
PS	240	Intro to Comparative Politics	3	0	1	0	0	0
PS	348	Government & Politics in Western Eurc	3	0	0	0	1	0
PS	289	Politics of the Vietnam War	3	0	1	0	0	0

Secondary Field of Concentration: Pre-Dentistry (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CHEM	232	Elementary Organic Chemistry I	3	0	1	0	0	0
CHEM	332	Elementary Organic Chemistry II	3	0	1	0	0	0
MCB	250	Molecular Genetics	3	0	0	1	0	0
MCB	253	Cellular Biology	2	0	1	0	0	0

Secondary Field of Concentration: Pre-Law (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	300	The Legal Environment of Bus	3	3	0	0	0	0
BTW	253	Bus Admin Comm	3	0	1	0	0	0
BTW	261	Principles of Tech. Communication	3	1	0	0	0	0
BTW	271	Persuasive Writing	3	0	0	0	0	0
LAW	301	Intro to Law	3	1	0	0	0	0
LAW	692	Current Legal Problems	1-12	0	1	0	0	0
PHIL	102	Logic and Reasoning	3	1	3	0	0	0
PHIL	106	Ethics and Social Policy	3	0	0	1	0	0
PS	220	Intro to Public Policy	3	1	0	0	0	0
PS	230	Intro to Pol Research	3	2	1	0	0	0
SOC	275	Criminology	3	0	0	1	0	0
SOC	477	Sociology of the Law	3	1	0	0	0	0
SPCM	101	Public Speaking	3	1	0	1	0	0
SPCM	323	Argumentation	3	1	1	0	0	0

Student Comments: (Pre) BADM 300 is a good introduction to law, and it supplements GE 400 well.

Secondary Field of Concentration: Pre-Medicine (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
MCB	150	Molec and Cellular Basis of Life	4	0	0	0	0	0
MCB	250	Molecular Genetics	4	0	0	0	0	0
MCB	251	Exp Technigs in Molecular Biol	2	0	0	0	0	0
CHEM	232	Elementary Organic Chemistry I	3	0	0	0	1	0
CHEM	233	Elementary Organic Chem Lab I	2	0	0	0	1	0
MCB	103	Intro to Human Physiology	3	1	0	0	0	0

Secondary Field of Concentration: Product Development (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	320	Principles of Marketing	3	1	2	0	1	0
BTW	250	Principles Bus Comm	3	2	1	0	0	0
ME	350	Design for Manufacturability	3	1	2	0	0	0
GE	410	Component Design	3	0	1	0	0	0
GE	402	Product Realization	3	0	0	0	0	0
GE	493HEC	Design for Six Sigma	4	2	0	0	0	0

Student Comments: (S04) This was a secondary field thrown together at the last minute. The

Secondary Field of Concentration: Psychology (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
PSYC	100	Intro to Psych	4	0	1	0	0	0
PSYC	216	Child Psych	3	0	0	1	0	0
PSYC	238	Abnormal Psych	3	0	0	1	0	0
PSYC	322	Intro to Mental Retardation	3	0	0	1	0	0

Secondary Field of Concentration: Real Estate Management (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
BADM	310	Management and Organizational Behavior	3	0	0	1	0	0
ACCY	200	Fundamentals of Accounting	3	0	0	0	1	0
ADV	300	Intro to Advertising	3	0	0	1	0	0
FIN	241	Fundamentals of Real Estate	3	1	0	0	0	0

Student Comments: FIN 341 is one of the most useful classes I took in college. It provided real world

Secondary Field of Concentration: Renewable Energy (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
ECE	430	Power Circuits and Electromechanics	3	0	1	0	0	0
ECE	431	Electric Machines	4	1	0	0	0	0
ECE	333	Green Electric Energy	3	0	1	1	0	0
ECE	476	Power System Analysis	3	1	0	0	0	0
ENG	497	Solar Decathalon		2	0	0	0	0
ME	300	Thermodynamics	3	1	0	1	0	0
NPRE	498	Special Topics: Wind Power	3	0	1	0	0	0
		Energy Systems, at Lincoln University, New Zealand	4	1	0	0	0	0
		Wind Energy Converters, at UNSW, Australia	4	1	0	0	0	0
		Biomass Energy, at UNSW, Australia	4	1	0	0	0	0

Student Comments: Prepares you for a Power Engineer Career.

Secondary Field of Concentration: Spanish (Option 4)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
SPAN	142	Intermed Spanish for Business	4	1	0	0	0	0
SPAN	199	Undergraduate Open Seminar	1-4	1	0	0	0	0
SPAN	204	Practical Review of Spanish	3	1	1	0	0	0
SPAN	208	Oral Spanish	3	1	1	0	0	0
SPAN	228	Spanish Composition	3	1	0	0	0	0

Student Comments: (Pre) This field is excellent if students plan to study abroad. “I’m glad to be one

Secondary Field of Concentration: Strategic & Management Consulting (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
GE	498 RLP	Leading Sustainable Change	3	1	0	0	0	0
BADM	310	Management and Organizational Behavior	3	0	0	1	0	0
ACCY	200	Fundamentals of Accounting	3	0	0	1	0	0
FIN	221	Corporate Finance	3	0	1	0	0	0

Student Comments: (SP07) GE 498 was a great course, especially for people who are interested in going into consulting.

Secondary Field of Concentration: Structures and Materials (Option 5)

			# Hrs	Excellent	Good	Fair	Poor	Horrible
CEE	460	Steel Structures, I	3	2	0	0	0	0
CEE	461	Reinforced Concrete, I	3	1	1	0	0	0
CEE	380	Geotechnical Engineering	3	0	2	0	0	0
CEE	463	Reinforced Concrete II	3	1	0	0	0	0
CEE	465	Design of structural systems	3	2	0	0	0	0
GE	412	Fund of Nondestructive Eval	3-4	1	0	0	0	0
MATH	380	Advanced Calculus	3	0	1	0	0	0
TAM	324	Same as CEE 300	4	1	0	0	0	0
TAM	424	Mechanics of Structural Metals	3	0	1	0	0	0
TAM	428	Mechanics of Composites	3	1	0	0	0	0

Student Comments: (SP07) CEE 465 was very rewarding!

Secondary Field of Concentration: Supply Chain Management (Option 5)

			# Hrs	Excellen	Good	Fair	Poor	Horrible
BADM	310	Business Organizational Management	3	0	0	1	0	0
BADM	379	Logistics Management	3	1	0	0	0	0
BADM	335	Supply Chain Basics	3	0	1	0	0	0

Secondary Field of Concentration:Sustainable Building/Development and End-Use Efficency (5

			# Hrs	Excellen	Good	Fair	Poor	Horrible
TSM	372	Intro HVAC	3	2	0	0	0	0
UP	423	Intro to International Planning	4	1	0	0	0	0
TSM	373	Intro HVAC	4	2	1	1	1	1
TSM	374	Intro HVAC	5	3	2	2	2	2
ABE	436	Renewable Engr. System	3	0	0	0	0	0
ENG	315	Mali Water Project	3	1	0	0	0	0
LA	370	Environmental Sustainability	3	1	0	0	0	0
PS	280	Intro to International Relations	3	0	0	0	0	0
ENGR	288	Tech University,Denmark: End-Use Efficency	3	1	0	0	0	0