EP.22.030

October 18, 2021

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN SENATE

COMMITTEE ON EDUCATIONAL POLICY (Final; Information)

EP.22.030 Report of Administrative Approvals through October 11, 2021

Senate committees are authorized to act for and in the name of the Senate on minor matters. Below is a listing of the administrative approvals the Senate Committee on Educational Policy approved at its meeting on October 11, 2021. Additional information for each approval is attached.

A. <u>Undergraduate Programs</u>

- 1) BS in Computer Engineering in the "Graduate Requirements" text at the top of the Program of Study table, add a link to the campus' General Education requirements website, noting students must complete these requirements along with the language requirement. In the Technical Electives section, add a note to clarify these are taken from the Departmentally Approved List of Technical Electives and are to include at least 1 Electrical Engineering Foundations course, at least 3 Advanced Computing Electives courses, and at least 1 Design Electives course for a total of 29 hours. Organize the list of courses so they are under each of these appropriate subcategories of Technical Electives and have headers accordingly. Remove AE 427, Mechanicals of Polymers (3 hours); ATMS 425, Air Quality Modeling (4 hours); CS 173, Discrete Structures (3 hours); CS 225, Data Structures (4 hours); ECE 374, Introduction to Algorithms & Models of Computation (4 hours); ECE 391, Computer Systems Engineering (4 hours); MATH 213, Basic Discrete Mathematics (3 hours); MATH 416, Abstract Linear Algebra (3 or 4 hours); ME 450, Modeling Materials Processing (3 hours); CS 498, Special Topics sections MP: Logic for Computer Science; VR: Virtual Reality; and AML, Applied Machine Learning (1-4 hours); and ECE 498, Special Topics in ECE section RC: Smart Phone Computing and Applications (0-4 hours). Add BIOE 485, Computational Mathematics for Machine Learning and Imaging (4 hours); CS 435, Cloud Networking (3 or 4 hours); ECE 407, Cryptography (3 or 4 hours); ECE 442, Silicon Photonics (3 or 4 hours); ECE 298, Special Topics – as approved (1-4 hours); STAT 425, Statistical Modeling I (3 or 4 hours); CS 441, Applied Machine Learning (3 or 4 hours); and ECE 484, Principles of Safe Autonomy (4 hours). There is no change to the total hours required for the degree.
- 2) BS in Electrical Engineering in the "Graduate Requirements" text at the top of the Program of Study table, add a link to the campus' General Education requirements website, noting students must complete these requirements along with the language requirement. In the Technical Electives section, add a note to clarify these are taken from the Departmentally Approved List of Technical Electives and are to include at least 6 hours of non-ECE electives, at least 20 hours of ECE electives, at least 3 Advanced Core Electives, and at least 3 ECE Labs, where at least 1 must be a Hardware Lab for a total of 30 hours. Organize the list of courses so they are under each of these appropriate subcategories of Technical Electives and have headers accordingly. Remove AE 427, Mechanicals of Polymers (3 hours); ATMS 425, Air Quality Modeling (4 hours); ECE 329, Fields and Waves I (3 hours); ECE 340, Semiconductor Electronics (3 hours); ECE 445, Senior Design Project Lab (4 hours); ECE 496, Senior Research Project (2 hours); ECE 499, Senior Thesis (2 hours); MATH 416, Abstract Linear Algebra (3 or 4 hours); and ME 450, Modeling Materials Processing (3 hours). Add BIOE 485, Computational Mathematics for Machine

Learning and Imaging (4 hours); CS 416, Data Visualization (3 or 4 hours); CS 435, Cloud Networking (3 or 4 hours); CS 441, Applied Machine Learning (3 or 4 hours); ECE 407, Cryptography (3 or 4 hours); ECE 442, Silicon Photonics (3 or 4 hours); ECE 298, Special Topics — as approved (1-4 hours); STAT 425, Statistical Modeling I (3 or 4 hours); and ECE 484, Principles of Safe Autonomy (4 hours)/ There is no change to the total hours required for the degree.

3) Minor in Electrical and Computer Engineering – in the Programming Requirement section, clarify the "Select one of the following (with no particular preference)" to add "unless ECE 220 is taken. Remove CS 125, Intro Computing: Engrg & Sci (4 hours) and add CS 124, Introduction to Computer Science I (3 hours). In the "Select one of the following options..." lists, add the total number of hours required from each list for clarity (10-11 for the Electrical Engineering Option and 15-16 for the Computing Engineering Option). There is no change to the total hours required for the minor.

10KP0109BS: COMPUTER ENGINEERING, BS

In Workflow

- 1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)
- 2. 1933 Head (b-hajek@illinois.edu; oelze@illinois.edu; erhan@illinois.edu)
- 3. KP Committee Chair (bsnewell@illinois.edu; kcp@illinois.edu; jmakela@illinois.edu; amccul2@illinois.edu; bodony@illinois.edu)
- 4. KP Dean (candyd@illinois.edu)
- 5. University Librarian (jpwilkin@illinois.edu)
- 6. Provost (kmartens@illinois.edu)
- 7. Senate EPC (bjlehman@illinois.edu; moorhouz@illinois.edu; kmartens@illinois.edu)
- 8. Senate (jtempel@illinois.edu)
- 9. U Senate Conf (none)
- 10. Board of Trustees (none)
- 11. IBHE (none)
- 12. HLC (kmartens@illinois.edu)
- 13. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

Approval Path

- Fri, 17 Sep 2021 20:55:47 GMT Deb Forgacs (dforgacs): Approved for U Program Review
- 2. Fri, 17 Sep 2021 21:07:12 GMT Erhan Kudeki (erhan): Approved for 1933 Head
- 3. Tue, 05 Oct 2021 18:30:37 GMT
 Brooke Newell (bsnewell): Approved for KP Committee Chair
- 4. Tue, 05 Oct 2021 18:34:19 GMT Candy Deaville (candyd): Approved for KP Dean
- 5. Tue, 05 Oct 2021 18:35:04 GMT John Wilkin (jpwilkin): Approved for University Librarian
- 6. Wed, 06 Oct 2021 16:44:04 GMT Kathy Martensen (kmartens): Approved for Provost

History

- 1. Apr 24, 2019 by Deb Forgacs (dforgacs)
- 2. Aug 12, 2019 by Deb Forgacs (dforgacs)
- 3. Feb 26, 2020 by Brooke Newell (bsnewell)
- 4. Mar 31, 2020 by Deb Forgacs (dforgacs)
- 5. Apr 14, 2020 by Deb Forgacs (dforgacs)
- 6. Apr 19, 2021 by Erhan Kudeki (erhan)
- 7. May 10, 2021 by Deb Forgacs (dforgacs)

Date Submitted:Fri, 17 Sep 2021 16:12:58 GMT

Viewing: 10KP0109BS: Computer Engineering, BS

Changes proposed by: Erhan Kudeki

Proposal Type:

Major (ex. Special Education)

This proposal is for a:

Revision

Administration Details

Official Program Name
Computer Engineering, BS
Sponsor College
Grainger College of Engineering
Sponsor Department
Electrical and Computer Engineering
Sponsor Name
Erhan Kudeki
Sponsor Email
erhan@illinois.edu
College Contact
Brooke Newell
College Contact Email
bsnewell@illinois.edu
Does this program have inter-departmental administration?
No
Proposal Title
Effective Catalog Term
Fall 2021
Provide a brief, concise description (not justification) of your proposal.
Administrative approval: Updating the course list related to Technical Electives, numerically ordering the MATH courses in the Foundationa Mathematics and Science courses, and providing clarifying language.
Program Justification

Update requested by the College to make corrections related to Technical Electives.

Why are these changes necessary?

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

Νo

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

CE BS program is ABET Accredited.

The Program Educational Objectives of the CE program presented to ABET is as follows:

The University of Illinois Computer Engineering program will produce graduates having the choice, talents, and knowledge to:

- 1. Pursue a diverse range of careers as engineers, consultants, and entrepreneurs.
- 2. Continue their education in leading graduate programs in engineering and interdisciplinary areas to emerge as researchers, experts, and educators.
- 3. Learn and create new knowledge in ever-changing environments of the 21st century, and communicate their work and ideas to colleagues and the public at large.
- 4. Practice and inspire high ethical and technical standards, and lead their professional disciplines, organizations, and communities globally. All four of these objectives require a student to possess all seven of the skills listed as Student Outcomes of our program (see below). The particular career paths listed in the first two objectives are engineers, consultants, entrepreneurs reachable directly after the B.S. degree as well as researchers, experts, and educators, typically for those graduates who choose to continue their education in some graduate program. Each of these six career choices will critically depend on students acquiring all seven of the particular skills enumerated as Student Outcomes, namely.
- 1. (Principles) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 2. (Design) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- 3. (Communication) an ability to communicate effectively with a range of audiences.
- 4. (Professionalism) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- 5. (Teamwork) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- 6. (Analysis) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- 7. (Learning) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Student's achievement of these objectives and outcomes are monitored and assessed using using a strategy that depends on Self-Assessment reports written by ECE instructors and course directors as well as student and alumni surveys.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs

Computer Engineering BS_Minor Revision_Side by Side Table.xlsx

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text - Overview Tab

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

Computer Engineering at The Grainger College of Engineering focuses on the development of vital computing technologies, ranging from chips to computers to networks to programming tools to key algorithms for building exciting applications. Fundamentally, Computer Engineering addresses the problem of building scalable, trustworthy computing systems, and the faculty's interests span a broad spectrum of issues pertinent to this theme. Computer engineering has taken the lead in revolutionizing many science and engineering disciplines with parallel computing, from chips to clouds to planet-scale critical infrastructures, and has defined new standards of security, privacy, and dependability for systems ranging from small circuits to the electric power grids of many nations. Students need a broad and sound set of mathematical and computing skills, and are well-served by a flexible curriculum that enables them to pursue topics of interest among the many subdisciplines in computing.

The computer engineering core curriculum focuses on fundamental computer engineering knowledge: circuits, systems, electromagnetics, computer systems, electronics for information processing and communication, and computer science. The rich set of ECE elective courses permits students to concentrate in any sub-discipline of computer engineering including: hardware systems; cyberphysical systems; foundations and theory; software and languages; algorithms and mathematical tools; trust, reliability, security; networking, mobile and distributed computing; big data analytics and systems; artificial intelligence, robotics, cybernetics.

Statement for Programs of Study Catalog

Graduation Requirements

Minimum Technical GPA (https://go.grainger.illinois.edu/TechnicalGPA/):2.0

TGPA is required for ECE courses (except ECE 316). SeeTechnical GPA (https://go.grainger.illinois.edu/TechnicalGPA/)to clarify requirements.

Minimum Overall GPA:2.0

Minimum hours required for graduation:128 hours

General education: Students must complete the Campus General Education (https://courses.illinois.edu/gened/DEFAULT/

DEFAULT/)requirements including the campus general education language requirement. Specific Advanced Composition courses required for this degree are listed below.

Orientation and Professional Development

Code	Title	Hours
ENG 100	Engineering Orientation ¹	0

Total Hours 0

Foundational Mathematics and Science

Code	Title	Hours
MATH 221	Calculus I ²	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 257	Linear Algebra with Computational Applications (Linear Algebra)	3
or MATH 416	Abstract Linear Algebra	
MATH 285	Intro Differential Equations (Linear Algebra)	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		29

Computer Engineering Technical Core

Code	Title	Hours
ECE 110	Introduction to Electronics ³	3
ECE 120	Introduction to Computing	4
ECE 210	Analog Signal Processing	4
ECE 220	Computer Systems & Programming	4
CS 173	Discrete Structures ⁴	3
CS 225	Data Structures	4
ECE 313	Probability with Engrg Applic ⁵	3
ECE 374	Introduction to Algorithms & Models of Computation	4
ECE 385	Digital Systems Laboratory	3
ECE 391	Computer Systems Engineering	4
Total Hours		36

Technical Electives

Code	Title	Hours
From the Departmentally Approved at least 3 Advanced Computing Elec	List of Technical Electives to include: at least 1 Electrical Engineering Foundations course, ctives, at least 1 Design Elective	29
AE 202	Aerospace Flight Mechanics	3
AE 302	Aerospace Flight Mechanics II	3
AE 311	Incompressible Flow	3
AE 312	Compressible Flow	3
AE 321	Mechs of Aerospace Structures	3
AE 352	Aerospace Dynamical Systems	3
AE 353	Aerospace Control Systems	3
AE 402	Orbital Mechanics	3 or 4
AE 403	Spacecraft Attitude Control	3 or 4
AE 410	Computational Aerodynamics	3 or 4
AE 412	Viscous Flow & Heat Transfer	4
AE 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AE 427	Course AE 427 Not Found	
AE 428	Mechanics of Composites	3
AE 433	Aerospace Propulsion	3 or 4
AE 434	Rocket Propulsion	3 or 4
AE 435	Electric Propulsion	3 or 4
AE 451	Aeroelasticity	3 or 4

A.F. 460	Association of the Community of the Comm	0
AE 460	Aerodynamics & Propulsion Lab	2
Agri. Bio Eng. (ABE): all 300 and 400 Advising Office.	D level courses except 440. Exceptions for seminars and special topics will be reviewed in	
ASTR 210	Introduction to Astrophysics	3
ASTR 310	Computing in Astronomy	3
ASTR 330	Extraterrestrial Life	3
ASTR 350	The Big Bang, Black Holes, and the End of the Universe	3
ASTR 404	Stellar Astrophysics	3
ASTR 405	Planetary Systems	3
ASTR 406	Galaxies and the Universe	3
ASTR 414		
ASTR 414 ASTR 450	Astronomical Techniques	4
ATMS 201	Astrochemistry General Physical Meteorology	4 3
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ATMS 301 ATMS 302	Atmospheric Thermodynamics	3
	Atmospheric Dynamics I	
ATMS 303	Synoptic-Dynamic Wea Analysis	4
ATMS 304	Radiative Transfer-Remote Sens	3
ATMS 305	Computing and Data Analysis	3
ATMS 404	Risk Analysis in Earth Science	3 or 4
ATMS 405	Boundary Layer Processes	4
ATMS 406	Tropical Meteorology	4
ATMS 410	Radar Remote Sensing	4
ATMS 411	Satellite Remote Sensing	4
ATMS 420	Atmospheric Chemistry	4
ATMS 421	Earth Systems Modeling	4
ATMS 425	Course ATMS 425 Not Found	
ATMS 447	Climate Change Assessment	3
ATMS 449	Biogeochemical Cycles	4
BIOC 406	Gene Expression & Regulation	3
BIOC 440	Physical Chemistry Principles	4
BIOC 446	Physical Biochemistry	3
BIOC 455	Technqs Biochem & Biotech	4
BIOE 201	Conservation Principles Bioeng	3
BIOE 202	Cell & Tissue Engineering Lab	2
BIOE 302	Modeling Human Physiology	3
BIOE 414	Biomedical Instrumentation	3
BIOE 415	Biomedical Instrumentation Lab	2
BIOE 461	Cellular Biomechanics	4
BIOE 467	Biophotonics	3
BIOE 476	Tissue Engineering	3
BIOE 480	Magnetic Resonance Imaging	3 or 4
BIOE 485	Computational Mathematics for Machine Learning and Imaging	4
Biophysics (BIOP): All 400 level cou	rses except seminars and special topics, which may be reviewed in the Advising Office	
CHBE 221	Principles of CHE	3
CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
CHBE 430	Unit Operations Laboratory	4
CHBE 431	Process Design	4
CHBE 440	Process Control and Dynamics	3
CHBE 451	Transport Phenomena	3

CHBE 452	Chemical Kinetics & Catalysis	3
CHBE 453	Electrochemical Engineering	2 or 3
CHBE 456	Polymer Science & Engineering	3
CHBE 457	Microelectronics Processing	3
CHBE 471	Biochemical Engineering	3 or 4
CHBE 472	Techniques in Biomolecular Eng	3 or 4
CHBE 473	Biomolecular Engineering	3 or 4
CHBE 474	Metabolic Engineering	3 or 4
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
Chemistry (CHEM): All 200, 300 and 4	400 level courses except 397, 497, 499, and seminars and special topics, which may be	
reviewed in the Advising Office		
CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 430	Ecological Quality Engineering	2
CEE 447	Atmospheric Chemistry	4
CEE 491	Decision and Risk Analysis	3 or 4
CPSC 265	Genetic Engineering Lab	3
CS 101	Intro Computing: Engrg & Sci (By Approval)	3
CS 173	Discrete Structures	3
CS 225	Data Structures	4
CS 242	Programming Studio	3
CS 357	Numerical Methods I	3
CS 410	Text Information Systems	3 or 4
CS 411	Database Systems	3 or 4
CS 412	Introduction to Data Mining	3 or 4
CS 413	Intro to Combinatorics	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 416	Data Visualization	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
CS 421	Programming Languages & Compilers	3 or 4
CS 422	Programming Language Design	3 or 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 427	Software Engineering I	3 or 4
CS 428	Software Engineering II	3 or 4
CS 429	Software Engineering II, ACP	3
CS 431	Embedded Systems	3 or 4
CS 433	Computer System Organization	3 or 4
CS 435	Cloud Networking	3 or 4
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 439	Wireless Networks	3 or 4

CS 440	Artificial Intelligence	3 or 4
CS 445	Computational Photography	3 or 4
CS 446	Machine Learning	3 or 4
CS 447	Natural Language Processing	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 460	Security Laboratory	3 or 4
CS 461	Computer Security I	4
CS 463	Computer Security II	3 or 4
CS 465	User Interface Design	4
CS 466	Introduction to Bioinformatics	3 or 4
CS 467	Social Visualization	3 or 4
CS 473	Algorithms	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
CS 477	Formal Software Development Methods	3 or 4
CS 481	Advanced Topics in Stochastic Processes & Applications	3 or 4
CS 484	Parallel Programming	3 or 4
CS 398	Special Topics (As approved)	1 to 4
CS 498	Special Topics (As approved)	1 to 4
ECE 297	Individual Study	1
ECE 304	Photonic Devices	3
ECE 307	Techniques for Engrg Decisions	3
ECE 310	Digital Signal Processing	3
ECE 311	Digital Signal Processing Lab	1
ECE 314	Probability in Engineering Lab	1
ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3
ECE 333	Green Electric Energy	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	3
ECE 343	Electronic Circuits Laboratory	1
ECE 350	Fields and Waves II	3
ECE 365	Data Science and Engineering	3
ECE 374	Introduction to Algorithms & Models of Computation	4
ECE 380	Biomedical Imaging	3
ECE 391	Computer Systems Engineering	4
ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 396	Honors Project	1 to 4
ECE 397	Individual Study in ECE	0 to 4
ECE 402	Electronic Music Synthesis	3
ECE 403	Audio Engineering	3
ECE 407	Cryptography	3 or 4
ECE 408	Applied Parallel Programming	4
ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3
ECE 414	Biomedical Instrumentation	3
ECE 415	Biomedical Instrumentation Lab	2
ECE 416	Biosensors	3
ECE 417	Multimedia Signal Processing	4
ECE 418	Image & Video Processing	4
ECE 419	Security Laboratory	3 or 4
ECE 420	Embedded DSP Laboratory	2
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TOT 422	Communitary Coccurity (4
ECE 422	Computer Security I	2 - 11 4
ECE 424	Computer Security II	3 or 4
ECE 425 ECE 428	Intro to VLSI System Design	3 3 or 4
ECE 428	Distributed Systems	
ECE 431	Electric Machinery	4
	Advanced Electric Machinery	3
ECE 435	Computer Networking Laboratory	3 or 4
ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 441	Physics & Modeling Semicond Dev	3
ECE 442	Silicon Photonics	3 or 4
ECE 443	LEDs and Solar Cells	4
ECE 444	IC Device Theory & Fabrication	4
ECE 445	Senior Design Project Lab	4
ECE 446	Principles of Experimental Research in Electrical Engineering	4
ECE 447	Active Microwave Ckt Design	3
ECE 448	Artificial Intelligence	3 or 4
ECE 451	Adv Microwave Measurements	3
ECE 452	Electromagnetic Fields	3
ECE 453	Wireless Communication Systems	4
ECE 454	Antennas	3
ECE 455	Optical Electronics	3 or 4
ECE 456	Global Nav Satellite Systems	4
ECE 457	Microwave Devices & Circuits	3
ECE 458	Applic of Radio Wave Propag	3
ECE 459	Communications Systems	3
ECE 460	Optical Imaging	4
ECE 461	Digital Communications	3
ECE 462	Logic Synthesis	3
ECE 463	Digital Communications Lab	2
ECE 464	Power Electronics	3
ECE 465	Optical Communications Systems	3
ECE 466	Optical Communications Lab	1
ECE 467	Biophotonics	3
ECE 468	Optical Remote Sensing	3
ECE 469	Power Electronics Laboratory	2
ECE 470	Introduction to Robotics	4
ECE 472	Biomedical Ultrasound Imaging	3
ECE 473	Fund of Engrg Acoustics	3 or 4
ECE 476	Power System Analysis	3
ECE 478	Formal Software Development Methods	3 or 4
ECE 480	Magnetic Resonance Imaging	3 or 4
ECE 481	Nanotechnology	4
ECE 482	Digital IC Design	3
ECE 483	Analog IC Design	3
ECE 485	MEMS Devices & Systems	3
ECE 486	Control Systems	4
ECE 487	Intro Quantum Electr for EEs	3
ECE 488	Compound Semicond & Devices	3
ECE 489	Robot Dynamics and Control	4
ECE 490	Introduction to Optimization	3 or 4

ECE 491	Numerical Analysis	3 or 4
ECE 491	Numerical Analysis Parallel Progrmg: Sci & Engrg	3 or 4
ECE 493	Advanced Engineering Math	3 or 4
ECE 495	Photonic Device Laboratory	3 01 4
ECE 496	Senior Research Project	2
ECE 499	Senior Thesis	2
ECE 298	Special Topics (As approved)	1 to 4
ECE 398	Special Topics (As approved) Special Topics in ECE (As approved)	0 to 4
ECE 498	Special Topics in ECE (As approved) Special Topics in ECE (As approved)	0 to 4
ENG 491	Interdisciplinary Design Proj (CubeSat, Solar Decathlon, Formula SAE, Baja SAE or by	1 to 4
LING 451	approval)	1 10 4
GEOL 107	Physical Geology	4
GEOL 208	History of the Earth System	4
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
GEOL 411	Structural Geol and Tectonics	4
GEOL 417	Geol Field Methods, Western US	6
GEOL 432	Mineralogy and Mineral Optics	4
GEOL 436	Petrology and Petrography	4
GEOL 440	Sedimentology and Stratigraphy	4
GEOL 450	Probing the Earth's Interior	3
GEOL 452	Introduction to Geophysics	4
GEOL 460	Geochemistry	3
IE 310	Deterministic Models in Optimization	3
IE 330	Industrial Quality Control	3
IE 360	Facilities Planning and Design	3
IE 361	Production Planning & Control	3
IE 400	Design & Anlys of Experiments	3 or 4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
IE 411	Optimization of Large Systems	3 or 4
IE 412	OR Models for Mfg Systems	3 or 4
IE 413	Simulation	3 or 4
IE 420	Financial Engineering	3 or 4
IE 430	Economic Found of Quality Syst	3 or 4
IE 431	Design for Six Sigma	3
IB 150	Organismal & Evolutionary Biol	4
IB 202	Physiology	3 or 4
IB 203	Ecology	4
IB 204	Genetics	3 or 4
IB 302	Evolution	4
IB 335	Plant Systematics	4
IB 348	Fish and Wildlife Ecology	3
IB 368	Vertebrate Natural History	4
IB 401	Introduction to Entomology	3 or 4
IB 405	Evolution of Traits and Genomes	3
IB 420	Plant Physiology	3
IB 421	Photosynthesis	3
IB 426	Env and Evol Physl of Animals	3
IB 427	Insect Physiology	4
IB 431	Behavioral Ecology	3
IB 432	Genes and Behavior	3
IB 440	Plants and Global Change	3

B444 Insect Ecology 3 of 4 B452 Conservation Biology 3 B453 Community Ecology 3 B451 Orimitology 4 B452 Mammology 4 B 463 Ichthylology 4 B 463 Ichthylology 4 B 464 Herpetology 4 B 467 Principles of Systematics 4 B 468 Insect Classification and Evol 4 B 471 General Mycology 1 B 472 Plant Molecular Biology 1 B 473 Plant Genomics 1 B 481 Vector-borne Diseases 4 B 482 Insect Peat Management 3 B 483 Insect Peat Management 3 B 485 Environ Toxicology & Health 3 B 486 Pesticide Toxicology 4 B 487 Insect Patholog 3 B 488 Insect Patholog 3 B 489 Envisor Toxicology & Health 3	IB 443	Evolutionary Ecology	3
18 452 Community Ecology 38 453	IB 444	Insect Ecology	3 or 4
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MATH 473 Algorithms 4			3 or 4
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MATH 475	Formal Madala of Computation	3 or 4
MATH 481	Formal Models of Computation Vector and Tensor Analysis	3 or 4
MATH 482	Linear Programming	3 or 4
MATH 484	Nonlinear Programming	3 or 4
MATH 487	Advanced Engineering Math	3 or 4
MATH 489	Dynamics & Differential Eqns	3 or 4
MCB 150	Molec & Cellular Basis of Life	4
MCB 250	Molecular Genetics	3
MCB 251	Exp Techniqs in Molecular Biol	
MCB 252	Cells, Tissues & Development	2
MCB 253	Exp Techniqs in Cellular Biol	2
MCB 300	Microbiology	3
MCB 301	Experimental Microbiology	3
MCB 314	Introduction to Neurobiology	3
MCB 316	Genetics and Disease	
MCB 354	Biochem & Phys Basis of Life	4 3
MCB 400	Cancer Cell Biology	3
MCB 400	Cellular Physiology	3
MCB 402	Sys & Integrative Physiology	3
MCB 403	Cell & Membrane Physiology Lab	1 or 2
MCB 404	Sys & Integrative Physiol Lab	1 to 2
MCB 406	Gene Expression & Regulation	3
MCB 408		
MCB 410	Immunology Developmental Rialogy Stem Calls and Regenerative Medicine	3
MCB 413	Developmental Biology, Stem Cells and Regenerative Medicine Endocrinology	3
MCB 419	Brain, Behavior & Info Process	3
MCB 421	Microbial Genetics	
MCB 424	Microbial Biochemistry	3
MCB 426		3
MCB 430	Bacterial Pathogenesis Molecular Microbiology	3
MCB 431	Microbial Physiology	3
MCB 433	Virology & Viral Pathogenesis	3
MCB 435	Evolution of Infectious Disease	
MCB 446	Physical Biochemistry	3
MCB 480	Eukaryotic Cell Signaling	3
ME 200	Thermodynamics	3
ME 310	Fundamentals of Fluid Dynamics	4
ME 320	Heat Transfer	4
ME 330	Engineering Materials	4
ME 340	Dynamics of Mechanical Systems	3.5
ME 370	Mechanical Design I	3
ME 371	Mechanical Design II	3
ME 400	Energy Conversion Systems	3 or 4
ME 401	Refrigeration and Cryogenics	3 or 4
ME 402	Design of Thermal Systems	3 or 4
ME 403	Internal Combustion Engines	3 or 4
ME 404	Intermediate Thermodynamics	4
ME 410	Intermediate Gas Dynamics	3 or 4
ME 411	Viscous Flow & Heat Transfer	3 01 4
ME 412	Numerical Thermo-Fluid Mechs	2 to 4
ME 420	Intermediate Heat Transfer	2 10 4
ME 430	Failure of Engrg Materials	3 or 4
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ME 431	Mechanical Component Failure	3 or 4
ME 440	Kinem & Dynamics of Mech Syst	3 or 4
ME 445	Introduction to Robotics	4
ME 450	Course ME 450 Not Found	
ME 451	Computer-Aided Mfg Systems	3 or 4
ME 452	Num Control of Mfg Processes	3 or 4
ME 460	Industrial Control Systems	4
ME 461	Computer Cntrl of Mech Systems	3 or 4
ME 471	Finite Element Analysis	3 or 4
ME 472	Introduction to Tribology	3 or 4
ME 485	MEMS Devices & Systems	3
ME 487	MEMS-NEMS Theory & Fabrication	4
MUS 407	Elect Music Techniques I	3
MUS 409	Elec Music Techniques II	2
NEUR 453	Cog Neuroscience of Vision	3 or 4
NPRE 201	Energy Systems	2 or 3
NPRE 247	Modeling Nuclear Energy System	3
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 412	Nuclear Power Econ & Fuel Mgmt	3 or 4
NPRE 421	Plasma and Fusion Science	3
NPRE 423	Plasma Laboratory	2
NPRE 429	Plasma Engineering	3
NPRE 431	Materials in Nuclear Engrg	3
NPRE 432	Nuclear Engrg Materials Lab	2
NPRE 435	Radiological Imaging	3
NPRE 441	Radiation Protection	4
NPRE 442	Radioactive Waste Management	3
NPRE 444	Nuclear Analytical Methods Lab	2 or 3
NPRE 446	Radiation Interact w/Matter I	3
NPRE 447	Radiation Interact w/Matter II	3
NPRE 448	Nuclear Syst Engrg & Design	4
NPRE 451	NPRE Laboratory	3
NPRE 455	Neutron Diffusion & Transport	4
NPRE 457	Safety Anlys Nucl Reactor Syst	3 or 4
NPRE 458	Design in NPRE	4
NPRE 470	Fuel Cells & Hydrogen Sources	3
NPRE 475	Wind Power Systems	3 or 4
PHYS 225	Relativity & Math Applications	2
PHYS 325	Classical Mechanics I	3
PHYS 326	Classical Mechanics II	3
PHYS 401	Classical Physics Lab	3
PHYS 402	Light	3 or 4
PHYS 403	Modern Experimental Physics	4 or 5
PHYS 406	Acoustical Physics of Music	4
PHYS 419	Space, Time, and Matter-ACP	3 or 4
PHYS 420	Space, Time, and Matter	2
PHYS 427	Thermal & Statistical Physics	4
PHYS 460	Condensed Matter Physics	4
PHYS 466	Atomic Scale Simulations	3 or 4
PHYS 470	Subatomic Physics	4
PHYS 485	Atomic Phys & Quantum Theory	3
PHYS 486	Quantum Physics I	4
	quantum i nyotoo i	4

DUNO 407	Occuptions Diservice II	4
PHYS 487	Quantum Physics II	4
PSYC 204	Intro to Brain and Cognition	3
SHS 200 SHS 240	General Phonetics Intro Sound & Hearing Science	3
	•	3
SHS 300	Anat & Physiol Spch Mechanism	4
SHS 301	General Speech Science	4
SHS 320	Development of Spoken Language	3
SHS 450	Intro Audiol & Hear Disorders	4
SHS 470	Neural Bases Spch Lang	4
STAT 420	Methods of Applied Statistics	3 or 4
STAT 424	Analysis of Variance	3 or 4
STAT 425	Statistical Modeling I	3 or 4
STAT 428	Statistical Computing	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 440	Statistical Data Management	3 or 4
SE 411	Reliability Engineering	3 or 4
SE 420	Digital Control Systems	4
SE 423	Mechatronics	3
SE 424	State Space Design for Control	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 324	Behavior of Materials	4
TAM 335	Introductory Fluid Mechanics	4
TAM 412	Intermediate Dynamics	4
TAM 435	Intermediate Fluid Mechanics	4
TAM 445	Continuum Mechanics	4
TAM 451	Intermediate Solid Mechanics	4
Select one course from the following	g list of Electrical Engineering Foundations Courses	
ECE 310	Digital Signal Processing	3
ECE 330	Power Ckts & Electromechanics	3
ECE 329	Fields and Waves I	3
ECE 340	Semiconductor Electronics	3
ECE 461	Digital Communications	3
ECE 486	Control Systems	4
Select three courses from the follow	ring list of Advanced Computing Electives	
CS 357	Numerical Methods I	3
CS 411	Database Systems	3 or 4
CS 412	Introduction to Data Mining	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
CS 421	Programming Languages & Compilers	3 or 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 431	Embedded Systems	3 or 4
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 440	Artificial Intelligence	3 or 4
	-	

CS 441	Applied Machine Learning	3 or 4
CS 446	Machine Learning	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 461	Computer Security I	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
CS 477	Formal Software Development Methods	3 or 4
CS 483	Applied Parallel Programming	4
CS 498	Special Topics (MP. Logic for Computer Science)	1 to 4
CS 498	Special Topics (VR: Virtual Reality)	1 to 4
CS 498	Special Topics (AML: Applied Machine Learning)	1 to 4
ECE 408	Applied Parallel Programming	4
ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3
ECE 419	Security Laboratory	3 or 4
ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3
ECE 428	Distributed Systems	3 or 4
ECE 435	Computer Networking Laboratory	3 or 4
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 448	Artificial Intelligence	3 or 4
ECE 462	Logic Synthesis	3
ECE 470	Introduction to Robotics	4
ECE 478	Formal Software Development Methods	3 or 4
ECE 484	Principles of Safe Autonomy	4
ECE 491	Numerical Analysis	3 or 4
ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4
ECE 498	Special Topics in ECE (RC: Smart Phone Computing and Applications)	0 to 4
One course from depart	rtmentally approved list below:	
Select one course from	n departmentally approved list below:	
ECE 411	Computer Organization & Design	4
ECE 445	Senior Design Project Lab ⁶	4
ECE 496	Senior Research Project (andECE 499- Senior Thesis) ⁶	4
Electives		
Code	Title	Hours
The Grainger College o	f Engineering Liberal Education course list, or additional courses from the campus General Education	6
	navioral Sciences or Humanities and the Arts ⁷	
	nal unrestricted course work, subject to certain exceptions as noted by the College, so that there are at earned toward the degree. ⁸	12

- 1 External transfer students takeENG 300 instead.
- MATH 220may be substituted, with four of the five credit hours applying toward the degree. MATH 220is appropriate for students with no background in calculus.

128

- Freshmen takeECE 110for 3 credit hours. Lab-only version taken by transfer students (with special permission) is 1 credit hour.
- MATH 213may be substituted.

Total Hours of Curriculum to Graduate

- 5 STAT 410may be substituted.
- Advanced Composition may be satisfied by completingECE 445orECE 496andECE 499or a course within either the general education or free elective categories which has the Advanced Composition designation.

7	The Grainger College of Engineeringapproved liberal education course list (https://go.grainger.illinois.edu/LiberalEducation/). Note that these credit hours could carry the required cultural studies designation required for campus general education requirements. The Grainger College of Engineeringrestrictions to free electives (https://go.grainger.illinois.edu/FreeElectives/).
Corresp	oonding Degree
BS Bac	helor of Science
Progr	am Features
Acaden	nic Level
Underg	raduate
Does th	is major have transcripted concentrations?
What is	the typical time to completion of this program?
4 years	
What a	re the minimum Total Credit Hours required for this program?
CIP Cod	de
140901	- Computer Engineering, General.
Is This No	a Teacher Certification Program?
Will spe	ecialized accreditation be sought for this program?
No	
Delive	ery Method
This pr	ogram is available:
On Can	npus - Students are required to be on campus, they may take some online courses.

Enrollment

Describe how this revision will impact enrollment and degrees awarded. No impact **Estimated Annual Number of Degrees Awarded** What is the matriculation term for this program? Fall **Budget** Are there budgetary implications for this revision? No Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available? No **Financial Resources** Will the unit need to seek campus or other external resources? No Are you seeking a change in the tuition rate or differential for this program? **Resource Implications Facilities** Will the program require new or additional facilities or significant improvements to already existing facilities? No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

 $\label{program require additional supplies, services or equipment (non-technical)?$

No

Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

No impact

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

No impact

EP Documentation

EP Control Number

EP.030

This proposal requires HLC inquiry

No

DMI Documentation

Banner/Codebook Name

BS:Computer Engineering -UIUC

Program Code:

10KP0109BS

Degree Code

BS

Major Code

0109

Program Reviewer Comments

Deb Forgacs (dforgacs) (Wed, 15 Sep 2021 14:49:49 GMT):Rollback: requested.

Deb Forgacs (dforgacs) (Mon, 27 Sep 2021 13:51:38 GMT):Changes to the proposal type the corresponding program and the CIP code due to system bug 09/27/2021

Kathy Martensen (kmartens) (Wed, 06 Oct 2021 16:30:07 GMT): Administrative approval: Doesn't change total hours required, doesn't restrict students' options.

Key: 248



Current Program of Study

Orientation and Profes	sional	
Development		
ENG 100	Engineering Orientation ¹	0
Total Hours		0

Foundational Mathemat	ics and	
Science	2	
MATH 221	Calculus I 2	4
	Linear Algebra with Computational	3
MATH 257	Applications (Linear Algebra)	3
or MATH 416	Abstract Linear Algebra	
MATH 231	Calculus II	3
	Calanter III	
MATH 241	Calculus III	4
	Intro Differential Equations (Linear	3
MATH 285	Algebra)	
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		29

Computer Engineering Technical		
Core		
ECE 110	Introduction to Electronics ³	3
ECE 120	Introduction to Computing	4
ECE 210	Analog Signal Processing	4
ECE 220	Computer Systems & Programming	4
CS 173	Discrete Structures ⁴	3
CS 225	Data Structures	4
ECE 313	Probability with Engrg Applic 5	3
	Introduction to Algorithms & Models of	4
ECE 374	Computation	4
ECE 385	Digital Systems Laboratory	3
ECE 391	Computer Systems Engineering	4
Total Hours		36

ľ	Technical Electives			
	29 hours to be selected from departmentally approved List of Technical			
	Electives below:			
•	AE 202	Aerospace Flight Mechanics	3	
	AE 302	Aerospace Flight Mechanics II	3	
	AE 311	Incompressible Flow	3	
	AE 312	Compressible Flow	3	
	AE 321	Mechs of Aerospace Structures	3	
	AE 352	Aerospace Dynamical Systems	3	
	AE 353	Aerospace Control Systems	3	
	AE 402	Orbital Mechanics	3 or 4	
	AE 403	Spacecraft Attitude Control	3 or 4	
	AE 410	Computational Aerodynamics	3 or 4	
	AE 412	Viscous Flow & Heat Transfer	4	
	AE 416	Applied Aerodynamics	3 or 4	
	AE 419	Aircraft Flight Mechanics	3 or 4	
	AE 420	Finite Element Analysis	3 or 4	
	AE 427	Course AE 427 Not Found		
	AE 428	Mechanics of Composites	3	
	AE 433	Aerospace Propulsion	3 or 4	
	AE 433 AE 434	Aerospace Propulsion Rocket Propulsion	3 or 4 3 or 4	
	AE 433 AE 434 AE 435	Aerospace Propulsion Rocket Propulsion Electric Propulsion	3 or 4 3 or 4 3 or 4	
	AE 433 AE 434 AE 435 AE 451	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity	3 or 4 3 or 4 3 or 4 3 or 4	
	AE 433 AE 434 AE 435 AE 451 AE 460	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab	3 or 4 3 or 4 3 or 4	
1	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions	3 or 4 3 or 4 3 or 4 3 or 4 2	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics	3 or 4 3 or 4 3 or 4 3 or 4 2	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab O0 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy	3 or 4 3 or 4 3 or 4 3 or 4 2	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life	3 or 4 3 or 4 3 or 4 3 or 4 2	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End	3 or 4 3 or 4 3 or 4 3 or 4 2	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 330 ASTR 350 ASTR 350 ASTR 350	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 330 ASTR 350 ASTR 404 ASTR 404	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 330 ASTR 350 ASTR 350 ASTR 350	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3 3	
1	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350 ASTR 350 ASTR 404 ASTR 405 ASTR 406	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3	
1	AE 433 AE 434 AE 435 AE 435 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350 ASTR 404 ASTR 405 ASTR 405 ASTR 414	Aerospace Propulsion Rocket Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques Astrochemistry	3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3 4	
1	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 330 ASTR 330 ASTR 350 ASTR 404 ASTR 405 ASTR 405 ASTR 405 ASTR 406 ASTR 406 ASTR 450	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques	3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3 3 4 4	
1	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350 ASTR 404 ASTR 405 ASTR 405 ASTR 406 ASTR 406 ASTR 414 ASTR 450 ATMS 201	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques Astrochemistry General Physical Meteorology	3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3 3 3 4 4 4 3	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350 ASTR 404 ASTR 405 ASTR 405 ASTR 406 ASTR 414 ASTR 450 ATMS 201 ATMS 301	Aerospace Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques Astrochemistry General Physical Meteorology Atmospheric Thermodynamics	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3 4 4 4 3 3	
I	AE 433 AE 434 AE 435 AE 435 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 310 ASTR 330 ASTR 350 ASTR 404 ASTR 404 ASTR 404 ASTR 405 ASTR 414 ASTR 450 ATMS 201 ATMS 301 ATMS 301 ATMS 302	Aerospace Propulsion Rocket Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques Astrochemistry General Physical Meteorology Atmospheric Thermodynamics Atmospheric Dynamics I	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 3 4 4 4 3 3 3	
I	AE 433 AE 434 AE 435 AE 451 AE 460 Agri. Bio Eng. (ABE): all 300 and 4 ASTR 210 ASTR 330 ASTR 350 ASTR 404 ASTR 405 ASTR 405 ASTR 406 ASTR 450 ATMS 201 ATMS 201 ATMS 301 ATMS 302 ATMS 302 ATMS 303	Aerospace Propulsion Rocket Propulsion Rocket Propulsion Electric Propulsion Aeroelasticity Aerodynamics & Propulsion Lab 00 level courses except 440. Exceptions Introduction to Astrophysics Computing in Astronomy Extraterrestrial Life The Big Bang, Black Holes, and the End of the Universe Stellar Astrophysics Planetary Systems Galaxies and the Universe Astronomical Techniques Astronomical Techniques Astrochemistry General Physical Meteorology Atmospheric Thermodynamics I Synoptic-Dynamic Wea Analysis	3 or 4 3 or 4 3 or 4 3 or 4 2 3 3 3 3 3 4 4 4 3 3 3	

New Program of Study

Orientation and Professional		
Development		
ENG 100	Engineering Orientation ¹	0
Total Hours		0

Foundational Mathem	atics and	
Science		
MATH 221	Calculus I ²	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
	Linear Algebra with Computational	
MATH 257	Applications	3
or MATH 416	Abstract Linear Algebra	
MATH 285	Intro to Differential Eq	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		29

Computer Engineering	g Technical	
Core		
ECE 110	Introduction to Electronics ³	3
ECE 120	Introduction to Computing	4
ECE 210	Analog Signal Processing	4
ECE 220	Computer Systems & Programming	4
CS 173	Discrete Structures ⁴	3
CS 225	Data Structures	4
ECE 313	Probability with Engrg Applic 5	3
	Introduction to Algorithms & Models of	of
ECE 374	Computation	4
ECE 385	Digital Systems Laboratory	3
ECE 391	Computer Systems Engineering	4
Total Hours		36

Technical Electives		
	ed List of Technical Electives, to include:	29
at least 1 Electrical Engineering Fo		
at least 3 Advanced Computing e at least 1 Design Elective	electives	
AE 202	Aerospace Flight Mechanics	3
AE 302	Aerospace Flight Mechanics II	3
AE 311	Incompressible Flow	3
AE 312	Compressible Flow	3
AE 321	Mechs of Aerospace Structures	3
AE 352	Aerospace Dynamical Systems	3
AE 353	Aerospace Control Systems	3
AE 402	Orbital Mechanics	3 or 4
AE 403	Spacecraft Attitude Control	3 or 4
AF 410	Computational Aerodynamics	3 or 4
AE 412	Viscous Flow & Heat Transfer	4
AF 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AL 420	Tillite Liement Analysis	3 01 4
AE 428	Mechanics of Composites	3
AE 433	Aerospace Propulsion	3 or 4
AE 434	Rocket Propulsion	3 or 4
AE 435	Electric Propulsion	3 or 4
AE 451	Aeroelasticity	3 or 4
AF 460	Aerodynamics & Propulsion Lab	2
•	00 level courses except 440. Exceptions	2
ASTR 210	Introduction to Astrophysics	3
ASTR 310	Computing in Astronomy	3
ASTR 330	Extraterrestrial Life	3
7.5111 330	The Big Bang, Black Holes, and the End	-
ASTR 350	of the Universe	3
ASTR 404	Stellar Astrophysics	3
ASTR 405	Planetary Systems	3
ASTR 406	Galaxies and the Universe	3
ASTR 414	Astronomical Techniques	4
ASTR 450	Astrochemistry	4
ATMS 201	General Physical Meteorology	3
ATMS 301	Atmospheric Thermodynamics	3
ATMS 302	Atmospheric Dynamics I	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4
ATMS 304	Radiative Transfer-Remote Sens	3
ATMS 305	Computing and Data Analysis	3
		-

ATMS 404					
	Risk Analysis in Earth Science	3 or 4	ATMS 404	Risk Analysis in Earth Science	3 or 4
ATMS 405	Boundary Layer Processes	4	ATMS 405	Boundary Layer Processes	4
ATMS 406	Tropical Meteorology	4	ATMS 406	Tropical Meteorology	4
ATMS 410	Radar Remote Sensing	4	ATMS 410	Radar Remote Sensing	4
ATMS 411	Satellite Remote Sensing	4	ATMS 411	Satellite Remote Sensing	4
ATMS 420	Atmospheric Chemistry	4	ATMS 420	Atmospheric Chemistry	4
ATMS 421	Earth Systems Modeling	4	ATMS 421	Earth Systems Modeling	4
ATMS 425	Air Quality Modeling	4			
ATMS 447	Climate Change Assessment	3	ATMS 447	Climate Change Assessment	3
ATMS 449	Biogeochemical Cycles	4	ATMS 449	Biogeochemical Cycles	4
BIOC 406	= -	3	BIOC 406	- · · · · · · · · · · · · · · · · · · ·	3
	Gene Expression & Regulation			Gene Expression & Regulation	
BIOC 440	Physical Chemistry Principles	4	BIOC 440	Physical Chemistry Principles	4
BIOC 446	Physical Biochemistry	3	BIOC 446	Physical Biochemistry	3
BIOC 455	Technqs Biochem & Biotech	4	BIOC 455	Technqs Biochem & Biotech	4
BIOE 201	Conservation Principles Bioeng	3	BIOE 201	Conservation Principles Bioeng	3
BIOE 202	Cell & Tissue Engineering Lab	2	BIOE 202	Cell & Tissue Engineering Lab	2
BIOE 302	Modeling Human Physiology	3	BIOE 302	Modeling Human Physiology	3
BIOE 414	Biomedical Instrumentation	3	BIOE 414	Biomedical Instrumentation	3
BIOE 415	Biomedical Instrumentation Lab	2	BIOE 415	Biomedical Instrumentation Lab	2
BIOE 461	Cellular Biomechanics	4	BIOE 461	Cellular Biomechanics	4
BIOE 467	Biophotonics	3	BIOE 467	Biophotonics	3
BIOE 476	Tissue Engineering	3	BIOE 476	Tissue Engineering	3
BIOE 480	Magnetic Resonance Imaging	3 or 4	BIOE 480	Magnetic Resonance Imaging	3 or 4
	.0			Computational Mathematics for	
			BIOE 485	Machine Learning and Imaging	4
Biophysics (BIOP): All 400 level of	ourses except seminars and special			00 level courses except seminars and special	
CHBE 221		2	CHBE 221		2
	Principles of CHE	3		Principles of CHE	3
CHBE 321	Thermodynamics	4	CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4	CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4	CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3	CHBE 424	Chemical Reaction Engineering	3
CHBE 430	Unit Operations Laboratory	4	CHBE 430	Unit Operations Laboratory	4
CHBE 431	Process Design	4	CHBE 431	Process Design	4
	_			=	
CHBE 440	Process Control and Dynamics	3	CHBE 440	Process Control and Dynamics	3
CHBE 451	Transport Phenomena	3	CHBE 451	Transport Phenomena	3
CHBE 452	Chemical Kinetics & Catalysis	3	CHBE 452	Chemical Kinetics & Catalysis	3
CHBE 453	Electrochemical Engineering	2 or 3	CHBE 453	Electrochemical Engineering	2 or 3
CHBE 456	Polymer Science & Engineering	3	CHBE 456	Polymer Science & Engineering	3
CHBE 457	Microelectronics Processing	3	CHBE 457	Microelectronics Processing	3
CHBE 471	Biochemical Engineering	3 or 4	CHBE 471	Biochemical Engineering	3 or 4
CHBE 472	Techniques in Biomolecular Eng	3 or 4	CHBE 472	Techniques in Biomolecular Eng	3 or 4
CHBE 473	Biomolecular Engineering	3 or 4	CHBE 473	Biomolecular Engineering	3 or 4
CHBE 474	Metabolic Engineering	3 or 4	CHBE 474	Metabolic Engineering	3 or 4
CHEM 102	General Chemistry I	3	CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1	CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry II	3	CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1	CHEM 105	General Chemistry Lab II	1
-	and 400 level courses except 397, 497,	•		00, 300 and 400 level courses except 397, 497,	-
CEE 310		2			2
	Transportation Engineering	3	CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3	CEE 330	Environmental Engineering	3
	Environmental Engineering Railroad Transportation Engrg	3 3 or 4			
CEE 330			CEE 330	Environmental Engineering	3
CEE 330 CEE 408	Railroad Transportation Engrg	3 or 4	CEE 330 CEE 408	Environmental Engineering Railroad Transportation Engrg	3 3 or 4
CEE 330 CEE 408 CEE 410	Railroad Transportation Engrg Railway Signaling & Control	3 or 4 3 or 4	CEE 330 CEE 408 CEE 410	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control	3 3 or 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering	3 or 4 3 or 4 3 or 4 2	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering	3 3 or 4 3 or 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry	3 or 4 3 or 4 3 or 4 2	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry	3 3 or 4 3 or 4 3 or 4 2
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis	3 or 4 3 or 4 3 or 4 2 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab	3 or 4 3 or 4 3 or 4 2	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab	3 3 or 4 3 or 4 3 or 4 2
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By	3 or 4 3 or 4 3 or 4 2 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval)	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval)	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By	3 3 or 4 3 or 4 3 or 4 2 4 3 or 4 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval)	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval)	3 or 4 3 or 4 2 4 3 or 4 3 3
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems	3 or 4 3 or 4 3 or 4 2 4 3 or 4 3 3 3	CEE 330 CEE 408 CEE 410 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 or 4 3 or 4 3 or 4 or 6
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 3 or 4 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems	3 3 or 4 3 or 4 2 or 4 2 4 3 or 4 3 3 3 3 3 or 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Data Structures Today Structures Data Mining Intro to Combinatorics	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 3 3 3 or 4 3 3 3 3 or 4 2 4 3 or 4 3 3 3	CEE 330 CEE 408 CEE 410 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 414	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization	3 or 4 0 or 4 0 or 4 or 5
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Data Structures Today Structures Data Mining Intro to Combinatorics	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 3 3 3 or 4 3 3 3 3 or 4 2 4 3 or 4 3 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 414	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization	3 or 4 0 or 4 0 or 4 or 5
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 414 CS 414 CS 418	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Data Structures Data Structures Data Structures Internation Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 416 CS 418 CS 419	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 419 CS 420	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 3 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 418 CS 419 CS 420	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 419 CS 420 CS 421	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Program; Sci & Engrg Programming Languages & Compilers	3 or 4 3 or 4 2 4 3 or 4
CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 421 CS 421 CS 422	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Data Structures Data Structures Data Structures Data Structures Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Programming Languages & Compilers Programming Language Design	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 4 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 416 CS 418 CS 419 CS 420 CS 421 CS 422	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Language Design	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 411 CS 411 CS 411 CS 412 CS 418 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 422 CS 423	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 422 CS 423	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 421 CS 422 CS 422 CS 423 CS 424	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Program; Sci & Engrg Programming Language Design Operating Systems Design Real-Time Systems	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 423 CS 424	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 411 CS 411 CS 411 CS 412 CS 418 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 422 CS 423	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 422 CS 423	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 421 CS 422 CS 422 CS 423 CS 424	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Program; Sci & Engrg Programming Language Design Operating Systems Design Real-Time Systems	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 4 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 423 CS 424	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 424 CS 425	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Prallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 3 3 3 or 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 422 CS 423 CS 424 CS 425	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Program; Sci & Engrg Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems Distributed Systems	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 419 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 425 CS 425 CS 426 CS 427	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Qperating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I	3 or 4 3 or 4 2 2 4 3 or 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 425 CS 426 CS 427	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Language Design Operating Systems Distributed Systems Distributed Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 424 CS 425 CS 424 CS 425 CS 426 CS 427 CS 428	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Pradllel Progrmg: Sci & Engrg Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 4 3 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 425 CS 426 CS 427 CS 428	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Programs: Sci & Engrg Programming Language & Compilers Programming Language Design Operating Systems Design Real-Time Systems Distributed Systems Compiler Construction Software Engineering I	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 425 CS 426 CS 427 CS 426 CS 427 CS 428 CS 429	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II, ACP	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 4 3 3 3 3 3 4 3 3 3 4 3 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 8 7 4 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 423 CS 424 CS 425 CS 425 CS 426 CS 427 CS 428 CS 429	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP	3 or 4 3
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 411 CS 411 CS 411 CS 412 CS 418 CS 419 CS 420 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 426 CS 427 CS 428 CS 429 CS 429 CS 431	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 3 or 4 3 or 7 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 429 CS 429 CS 421	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II	3 or 4 0 or 4 or 4 or 4 or 4 or 4 or 4 or
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 425 CS 426 CS 427 CS 426 CS 427 CS 428 CS 429	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II, ACP	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 4 3 3 3 3 3 4 3 3 3 4 3 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 8 7 4 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 425 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 431 CS 431 CS 431	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Programs: Sci & Engrg Programming Language Design Operating Systems Design Operating Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer Organization	3 or 4 3
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 411 CS 411 CS 411 CS 412 CS 418 CS 419 CS 420 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 426 CS 427 CS 428 CS 429 CS 429 CS 431	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 3 or 4 3 or 7 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 429 CS 429 CS 421	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programs: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer System Organization Cloud Networking	3 or 4 0 or 4 or 4 or 4 or 4 or 4 or 4 or
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 411 CS 411 CS 411 CS 412 CS 418 CS 419 CS 420 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 426 CS 427 CS 428 CS 429 CS 429 CS 431	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progring: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 4 3 3 3 3 3 or 4 3 or 7 3	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 422 CS 425 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 431 CS 431 CS 431	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Programs: Sci & Engrg Programming Language Design Operating Systems Design Operating Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer Organization	3 or 4 3
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 428 CS 429 CS 431 CS 433 CS 431 CS 433	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Pradllel Programs: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Computer Systems	3 or 4 3 or 4 3 or 4 3 3 3 3 4 3 3 3 3 4 3 3 3 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 8 7 4 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 415 CS 418 CS 419 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 421 CS 428 CS 429 CS 431 CS 433 CS 431 CS 433 CS 431 CS 433 CS 433 CS 433	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Programs: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer System Organization Cloud Networking	3 or 4 or
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 428 CS 429 CS 431 CS 433 CS 433 CS 434	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II, ACP Embedded Systems Computer Networking Laboratory	3 or 4 3 or 4 2 4 3 or 4 3 3 3 3 3 4 3 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 4 3 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 431 CS 433 CS 431 CS 433 CS 435 CS 436 CS 438	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer Systems Computer Systems Computer Systems Computer Systems Computer System Organization Cloud Networking Computer Networking Laboratory	3 or 4 3
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 427 CS 428 CS 429 CS 428 CS 429 CS 433 CS 434 CS 438 CS 438 CS 438 CS 439	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II Software Engineering II Software Engineering II Computer System Organization Computer Networking Laboratory Communication Networks Wireless Networks	3 or 4 3 or 4 3 or 4 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 416 CS 418 CS 419 CS 420 CS 421 CS 425 CS 427 CS 428 CS 426 CS 427 CS 428 CS 429 CS 431 CS 433 CS 433 CS 433 CS 435 CS 436 CS 438 CS 439	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Programg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II Software Engineering II Software Systems Computer Systems Computer Systems Computer Networking Computer Networking Laboratory Communication Networks Wireless Networks	3 or 4
CEE 330 CEE 408 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 424 CS 425 CS 426 CS 427 CS 428 CS 428 CS 429 CS 431 CS 433 CS 436 CS 438 CS 439 CS 439 CS 440	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Databse Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Prallel Programs: Sci & Engrg Programming Languages & Compilers Programming Languages & Compilers Distributed Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Computer Systems Computer System Organization Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence	3 or 4 3 or 4 3 or 4 3 3 3 3 3 3 3 4 3 3 3 3 3 or 4	CEE 330 CEE 408 CEE 410 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 415 CS 418 CS 419 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 426 CS 428 CS 429 CS 421 CS 428 CS 429 CS 431 CS 433 CS 436 CS 438 CS 438 CS 439 CS 440	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Parallel Progrmg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Distributed Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II, ACP Embedded Systems Computer System Organization Cloud Networking Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence	3 or 4 or
CEE 330 CEE 408 CEE 410 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 173 CS 225 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 418 CS 419 CS 420 CS 420 CS 421 CS 420 CS 421 CS 422 CS 423 CS 424 CS 425 CS 424 CS 425 CS 425 CS 425 CS 426 CS 427 CS 428 CS 428 CS 429 CS 433 CS 434 CS 438 CS 436 CS 438 CS 439	Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Discrete Structures Data Structures Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Interactive Computer Graphics Production Computer Graphics Programming Languages & Compilers Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II Software Engineering II Software Engineering II Computer System Organization Computer Networking Laboratory Communication Networks Wireless Networks	3 or 4 3 or 4 3 or 4 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 4 3 or 4	CEE 330 CEE 408 CEE 410 CEE 416 CEE 416 CEE 430 CEE 447 CEE 491 CPSC 265 CS 101 CS 242 CS 357 CS 410 CS 411 CS 412 CS 413 CS 414 CS 416 CS 418 CS 419 CS 420 CS 421 CS 425 CS 427 CS 428 CS 426 CS 427 CS 428 CS 429 CS 431 CS 433 CS 433 CS 433 CS 435 CS 436 CS 438 CS 439	Environmental Engineering Railroad Transportation Engrg Railway Signaling & Control Traffic Capacity Analysis Ecological Quality Engineering Atmospheric Chemistry Decision and Risk Analysis Genetic Engineering Lab Intro Computing: Engrg & Sci (By Approval) Programming Studio Numerical Methods I Text Information Systems Database Systems Introduction to Data Mining Intro to Combinatorics Multimedia Systems Data Visualization Interactive Computer Graphics Production Computer Graphics Production Computer Graphics Parallel Programg: Sci & Engrg Programming Languages & Compilers Programming Language Design Operating Systems Design Real-Time Systems Distributed Systems Compiler Construction Software Engineering I Software Engineering II Software Engineering II Software Engineering II Software Systems Computer Systems Computer Systems Computer Networking Computer Networking Laboratory Communication Networks Wireless Networks	3 or 4

CS 446	Machine Learning	3 or 4	CS 446	Machine Learning	3 or 4
CS 447	Natural Language Processing	3 or 4	CS 447	Natural Language Processing	3 or 4
CS 450	Numerical Analysis	3 or 4	CS 450	Numerical Analysis	3 or 4
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CS 460	Security Laboratory	3 or 4	CS 460	Security Laboratory	3 or 4
CS 461	Computer Security I	4	CS 461	Computer Security I	4
CS 463	Computer Security II	3 or 4	CS 463	Computer Security II	3 or 4
CS 465	User Interface Design	4	CS 465	User Interface Design	4
CS 466	Introduction to Bioinformatics	3 or 4	CS 466	Introduction to Bioinformatics	3 or 4
CS 467	Social Visualization	3 or 4	CS 467	Social Visualization	3 or 4
CS 473	Algorithms	4	CS 473	Algorithms	4
CS 475	Formal Models of Computation	3 or 4	CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4	CS 476	Program Verification	3 or 4
C5 17 C	Formal Software Development	5 0	65 176	Formal Software Development	5 0
CS 477	-	3 or 4	CS 477	·	3 or 4
C3 4//	Methods		C3 477	Methods	
	Advanced Topics in Stochastic	3 or 4		Advanced Topics in Stochastic	3 or 4
CS 481	Processes & Applications		CS 481	Processes & Applications	
CS 484	Parallel Programming	3 or 4	CS 484	Parallel Programming	3 or 4
CS 398	Special Topics (As approved)	1 to 4	CS 398	Special Topics (As approved)	1 to 4
CS 498	Special Topics (As approved)	1 to 4	CS 498	Special Topics (As approved)	1 to 4
ECE 297	Individual Study	1	ECE 297	Individual Study	1
ECE 304	Photonic Devices	3	ECE 304	Photonic Devices	3
ECE 307	Techniques for Engrg Decisions	3	ECE 307	Techniques for Engrg Decisions	3
ECE 310	Digital Signal Processing	3	ECE 310	Digital Signal Processing	3
ECE 311	Digital Signal Processing Lab	1	ECE 311	Digital Signal Processing Lab	1
ECE 314	Probability in Engineering Lab	1	ECE 314	Probability in Engineering Lab	1
ECE 329	Fields and Waves I	3	ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3	ECE 330	Power Ckts & Electromechanics	3
ECE 333	Green Electric Energy	3	ECE 333	Green Electric Energy	3
ECE 340	Semiconductor Electronics	3	ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	3	ECE 342	Electronic Circuits	3
ECE 343	Electronic Circuits Laboratory	1	ECE 343	Electronic Circuits Laboratory	1
ECE 350	Fields and Waves II	3	ECE 350	Fields and Waves II	3
ECE 365			ECE 365		3
LCL 303	Data Science and Engineering	3	LCL 303	Data Science and Engineering	5
FCF 274	Introduction to Algorithms & Models o	† 4			
ECE 374	Computation		l		_
ECE 380	Biomedical Imaging	3	ECE 380	Biomedical Imaging	3
ECE 391	Computer Systems Engineering	4	l		
ECE 395	Advanced Digital Projects Lab	2 or 3	ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 396	Honors Project	1 to 4	ECE 396	Honors Project	1 to 4
ECE 397	Individual Study in ECE	0 to 4	ECE 397	Individual Study in ECE	0 to 4
ECE 402	Electronic Music Synthesis	3	ECE 402	Electronic Music Synthesis	3
ECE 403	Audio Engineering	3	ECE 403	Audio Engineering	3
	5 5		ECE 407	Cryptography	3 or 4
ECE 408	Applied Parallel Programming	4	ECE 408	Applied Parallel Programming	4
					-
ECE 411			ECE 411		4
	Computer Organization & Design	4	ECE 411	Computer Organization & Design	4
ECE 412	Computer Organization & Design Microcomputer Laboratory	4 3	ECE 412	Computer Organization & Design Microcomputer Laboratory	3
ECE 412 ECE 414	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation	4 3 3	ECE 412 ECE 414	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation	3
ECE 412 ECE 414	Computer Organization & Design Microcomputer Laboratory	4 3	ECE 412	Computer Organization & Design Microcomputer Laboratory	3
ECE 412 ECE 414 ECE 415	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation	4 3 3	ECE 412 ECE 414	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation	3
ECE 412 ECE 414 ECE 415 ECE 416	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors	4 3 3 2	ECE 412 ECE 414 ECE 415	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors	3 3 2
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing	4 3 3 2 3	ECE 412 ECE 414 ECE 415 ECE 416	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing	3 3 2 3
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing	4 3 3 2 3 4 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing	3 3 2 3 4 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory	4 3 3 2 3 4 4 3 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory	3 3 2 3 4 4 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory	4 3 3 2 3 4 4 4 3 or 4 2	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory	3 3 2 3 4 4 3 or 4 2
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I	4 3 3 2 3 4 4 3 or 4 2	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I	3 3 2 3 4 4 3 or 4 2
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II	3 2 3 4 4 3 or 4 2 4 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design	3 2 3 4 4 3 or 4 2 4 3 or 4 3
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems	3 2 3 4 4 3 or 4 2 4 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 425 ECE 428	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems	3 2 3 4 4 3 or 4 2 4 3 or 4 3
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 424 ECE 425 ECE 425 ECE 428 ECE 431 ECE 435	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Computer Networking Laboratory	4 3 2 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428 ECE 428 ECE 428 ECE 428 ECE 431 ECE 432 ECE 432 ECE 432 ECE 433	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 or 4 3 3 or 4 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 432 ECE 432	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation	3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 425 ECE 425 ECE 425 ECE 427 ECE 431 ECE 433 ECE 437 ECE 438	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 437 ECE 437	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks	3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 425 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 435 ECE 437 ECE 438 ECE 438	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 4 4 3 or 4 5	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 425 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 435 ECE 437 ECE 438 ECE 438	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 437 ECE 438 ECE 438 ECE 439 ECE 439	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 3
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 432 ECE 432 ECE 432 ECE 432 ECE 434	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev	4 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 3 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 3	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 442	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 4 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 432 ECE 435 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev	4 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 3 3 or 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 425 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 432 ECE 435 ECE 435 ECE 436 ECE 438 ECE 439 ECE 441	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 3	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 442	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells	3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 4 3 or 4
ECE 412 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 425 ECE 425 ECE 425 ECE 425 ECE 431 ECE 431 ECE 432 ECE 435 ECE 435 ECE 436 ECE 438 ECE 439 ECE 441	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 4 3 3 or 4 4 4 3 or 4 4 4 3 or 4 6 7 8 or 4 8 or 4 9 or 4 8 or 4 9 or 5 9 or 4 9 or 4 9 or 5 9 or 4 9 or 4 9 or 5 9 or 4 9 or 5 9 or 5 0	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 4 3 or 4 4 4 3 or 4 4 4 3 or 4 4 4 3 or 4 6 7 or 4 8 or 4 9 or 5 9 or 4 9 or 4 9 or 4 9 or 4 9 or 4 9 or 5 9 or 4 9 or 5 0 or 4 0 or 5 0 or 4 0 or 5 0 o	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab	3 3 4 4 4 3 or 4 2 4 3 or 4 4 3 3 or 4 4 4 4 4 4
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425 ECE 425 ECE 428 ECE 431 ECE 432 ECE 437 ECE 438 ECE 439 ECE 439 ECE 444 ECE 444 ECE 445 ECE 445	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 4 3 3 or 4 4 4 4 3 or 4 4 4 3 or 4 4 4 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 442 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physes & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 4 3 3 or 4 4 4 4 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 436 ECE 437 ECE 438 ECE 439 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3
ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444 ECE 444 ECE 444 ECE 444 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 4 4 4 4 4 4 3 5 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 434 ECE 435 ECE 437 ECE 438 ECE 439 ECE 434 ECE 444 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 431 ECE 432 ECE 437 ECE 438 ECE 444 ECE 445 ECE 444 ECE 445 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 447 ECE 448 ECE 447	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements	4 3 3 2 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 4 5 6 7 8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 444 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Wireless Networks Electrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 or 4 3 3 or 4 4 4 4 4 4 4 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 4 4 4 4 4 4 4 3 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 414 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 425 ECE 428 ECE 431 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 4 3 or 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 442 ECE 444 ECE 444 ECE 444 ECE 444	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 4 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 433 ECE 438 ECE 439 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 444 ECE 445 ECE 444 ECE 445 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 452 ECE 453	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 3 4 4 4 4 3 3 or 4 3 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 4 4 4 8 8 8 8 8 8 8 8 8 8 8 8 8
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 432 ECE 434 ECE 435 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 447 ECE 448 ECE 451 ECE 452 ECE 452 ECE 452 ECE 453 ECE 453 ECE 453 ECE 453 ECE 455	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 3 or 4 4 4 4 5 6 7 8 8 8 8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 434 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444 ECE 445 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 453 ECE 453	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 3 4 4 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 3 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 432 ECE 434 ECE 435 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 447 ECE 448 ECE 451 ECE 452 ECE 452 ECE 452 ECE 453 ECE 453 ECE 453 ECE 453 ECE 455	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 444 ECE 445 ECE 444 ECE 445 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 452 ECE 453	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 3 4 4 4 4 4 3 3 or 4 3 4 4 4 4 4 4 3 3 or 4 3 4 4 4 4 4 4 8 8 8 8 8 8 8 8 8 8 8 8
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 431 ECE 432 ECE 433 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 447 ECE 446 ECE 451 ECE 452 ECE 453 ECE 451 ECE 452 ECE 453 ECE 453 ECE 453 ECE 453 ECE 455 ECE 455 ECE 455	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 3 or 4 4 4 4 5 6 7 8 8 8 8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 434 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444 ECE 445 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 453 ECE 453	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 3 4 4 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 433 ECE 438 ECE 438 ECE 439 ECE 444 ECE 445 ECE 453 ECE 454 ECE 455 ECE 455 ECE 455 ECE 455	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems	4 3 2 3 4 4 3 or 4 2 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 4 4 3 3 or 4 4 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 4 4 4	ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 439 ECE 438 ECE 439 ECE 441 ECE 442 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 448 ECE 448 ECE 455 ECE 455 ECE 455 ECE 455 ECE 455 ECE 455 ECE 456	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 433 ECE 437 ECE 438 ECE 437 ECE 448 ECE 441 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 453 ECE 454 ECE 455 ECE 455 ECE 456 ECE 456 ECE 457	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 3 3 or 4 4 4 4 4 4 5 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 434 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 455 ECE 453 ECE 455 ECE 455 ECE 455 ECE 455 ECE 456 ECE 456	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Giobal Nav Satellite Systems Microwave Devices & Circuits	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 428 ECE 431 ECE 432 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 446 ECE 445 ECE 445 ECE 456 ECE 456 ECE 456 ECE 457 ECE 458	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag	4 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 4 3	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 433 ECE 434 ECE 435 ECE 438 ECE 431 ECE 438 ECE 431 ECE 436 ECE 441 ECE 445 ECE 455 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 445 ECE 446 ECE 457 ECE 458 ECE 456 ECE 457 ECE 456 ECE 457 ECE 456 ECE 457 ECE 458	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag	3 3 4 4 4 3 3 or 4 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 4 3 3 or 5
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 431 ECE 432 ECE 433 ECE 437 ECE 438 ECE 447 ECE 448 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 451 ECE 453 ECE 451 ECE 452 ECE 453 ECE 456 ECE 455 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communication Systems	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 441 ECE 444 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 455 ECE 458 ECE 455 ECE 458 ECE 456 ECE 456 ECE 457 ECE 458 ECE 458 ECE 458 ECE 458	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physos & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communication Systems	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 4 4 4 4 3 3 or 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 5 or 4 6 or 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 435 ECE 438 ECE 437 ECE 438 ECE 439 ECE 441 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 453 ECE 455 ECE 455 ECE 456 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 460	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 3 4 4 4 4 3 3 or 4 3 4 4 4 3 4 4 4 3 4 4 4 3 4 4 4 3 4 4 4 4 3 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 453 ECE 453 ECE 454 ECE 455 ECE 455 ECE 456 ECE 457 ECE 458 ECE 458 ECE 459 ECE 459 ECE 458 ECE 459 ECE 458 ECE 459	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 4 4 4 4 4 3 4 4 4 4 4 5 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 433 ECE 437 ECE 438 ECE 437 ECE 448 ECE 441 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 447 ECE 448 ECE 451 ECE 452 ECE 453 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 459 ECE 460 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 4 3 or 4 3 or 4 4 4 3 or 4 4 4 4 4 5 or 4 6 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 455 ECE 453 ECE 451 ECE 455 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	3 3 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 3 or 4 4 4 4 4 3 3 3 or 4 4 4 4 4 3 3 3 or 4 4 4 4 4 4 3 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 445 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 4 or 4 4 or 4 5 or 4 6	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 437 ECE 438 ECE 437 ECE 438 ECE 441 ECE 442 ECE 444 ECE 455 ECE 455 ECE 456 ECE 456 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 459 ECE 458 ECE 459 ECE 458 ECE 459 ECE 458 ECE 459 ECE 460 ECE 460 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 5 or 6 6 or 7 6 or 7 7 7 8 or 7 8 or 8 8
ECE 411 ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 425 ECE 428 ECE 423 ECE 431 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 457 ECE 458 ECE 459 ECE 456 ECE 457 ECE 458 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 4 3 or 4 3 or 4 4 4 3 or 4 4 4 4 4 5 or 4 6 or 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 451 ECE 455 ECE 453 ECE 451 ECE 455 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 3 3 or 4 3 3 or 4 4 3 or 4 3 or 4 4 3 or 4 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 445 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 4 or 4 4 or 4 5 or 4 6	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 437 ECE 438 ECE 437 ECE 438 ECE 441 ECE 442 ECE 444 ECE 455 ECE 455 ECE 456 ECE 456 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 459 ECE 458 ECE 459 ECE 458 ECE 459 ECE 458 ECE 459 ECE 460 ECE 460 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 3 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 3 or 4 4 or 4 5 or 6 6 or 7 6 or 7 7 7 8 or 7 8 or 8 8
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 424 ECE 425 ECE 428 ECE 431 ECE 433 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 455 ECE 456 ECE 457 ECE 458 ECE 457 ECE 458 ECE 458 ECE 458 ECE 459 ECE 450 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 462 ECE 462 ECE 463 ECE 464	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab	4 3 3 2 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 3 or 8 3 or 9 3 or	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 438 ECE 437 ECE 438 ECE 439 ECE 441 ECE 442 ECE 444 ECE 445 ECE 441 ECE 445 ECE 445 ECE 445 ECE 446 ECE 447 ECE 448 ECE 445 ECE 446 ECE 447 ECE 448 ECE 447 ECE 455 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 459 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 461	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Kt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab	3 3 4 4 4 3 3 or 4 4 3 3 or 4 4 4 4 4 3 3 or 5
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 437 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 457 ECE 458 ECE 459 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 4 4 4 3 3 or 4 4 or 4 6 or 7 7 7 8 or 7 8 o	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 455 ECE 448 ECE 451 ECE 445 ECE 445 ECE 446 ECE 451 ECE 455 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 458 ECE 459 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 459 ECE 459 ECE 450 ECE 450 ECE 450 ECE 450 ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 455 ECE 456 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 459 ECE 450 ECE 450 ECE 450 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab Power Electronics	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 4 or 4 6 or 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 432 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 457 ECE 458 ECE 456 ECE 457 ECE 458 ECE 456 ECE 466 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab Power Electronics Soptical Communications Systems Optical Communications Systems	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 4 4 4 3 3 or 4 3 3 4 4 3 3 1 4 4 3 3 1 4 4 3 3 1 4 4 3 3 1 4 4 3 3 1 4 4 3 3 1 4 4 3 3 1 4 4 3 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 4 3 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 433 ECE 437 ECE 438 ECE 439 ECE 439 ECE 441 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 455 ECE 456 ECE 456 ECE 458 ECE 459 ECE 458 ECE 458 ECE 456 ECE 456 ECE 456 ECE 457 ECE 458 ECE 458 ECE 458 ECE 456 ECE 456 ECE 456 ECE 456 ECE 456 ECE 460 ECE 461 ECE 462 ECE 464 ECE 462 ECE 464 ECE 465 ECE 466	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physos & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab Power Electronics Coptical Communications Systems Optical Communications Systems	3 3 4 4 4 3 3 or 4 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
ECE 412 ECE 414 ECE 415 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 437 ECE 438 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 445 ECE 445 ECE 446 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 463 ECE 464 ECE 465	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Computer Security II Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Systems Optical Communications Systems Optical Imaging	4 3 3 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 4 4 4 3 3 or 4 3 3 or 4 4 4 3 3 or 4 3 3 or 4 3 3 or 4 4 3 3 or 4 4 3 or 4 4 or 8 3 or 8 4 or 8 6 or 8	ECE 412 ECE 414 ECE 415 ECE 416 ECE 417 ECE 418 ECE 419 ECE 420 ECE 422 ECE 424 ECE 425 ECE 428 ECE 431 ECE 432 ECE 433 ECE 435 ECE 437 ECE 438 ECE 439 ECE 444 ECE 445 ECE 445 ECE 445 ECE 446 ECE 445 ECE 446 ECE 457 ECE 458 ECE 457 ECE 458 ECE 457 ECE 458 ECE 457 ECE 458 ECE 459 ECE 456 ECE 457 ECE 458 ECE 459 ECE 466 ECE 461 ECE 462 ECE 463 ECE 464	Computer Organization & Design Microcomputer Laboratory Biomedical Instrumentation Biomedical Instrumentation Lab Biosensors Multimedia Signal Processing Image & Video Processing Security Laboratory Embedded DSP Laboratory Computer Security I Intro to VLSI System Design Distributed Systems Electric Machinery Advanced Electric Machinery Computer Networking Laboratory Sensors and Instrumentation Communication Networks Wireless Networks Physcs & Modeling Semicond Dev Silicon Photonics LEDs and Solar Cells IC Device Theory & Fabrication Senior Design Project Lab Principles of Experimental Research in Electrical Engineering Active Microwave Ckt Design Artificial Intelligence Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Lab Power Electronics Optical Communications Systems	3 3 4 4 4 3 or 4 2 4 3 or 4 3 3 or 4 3 3 or 4 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 4 3 3 or 4 3 3 or 4 4 4 4 4 3 3 or 4 4 or 4 3 or 4 4 or 4 5 or 7 6 or 8 6 or

ECE 469	Power Electronics Laboratory	2	ECE 469	Power Electronics Laboratory	2
ECE 470	Introduction to Robotics	4	ECE 470	Introduction to Robotics	4
ECE 470	Biomedical Ultrasound Imaging	3	ECE 470	Biomedical Ultrasound Imaging	3
				0 0	
ECE 473	Fund of Engrg Acoustics	3 or 4	ECE 473	Fund of Engrg Acoustics	3 or 4
ECE 476	Power System Analysis	3	ECE 476	Power System Analysis	3
	Formal Software Development	3 or 4		Formal Software Development	3 or 4
ECE 478	Methods		ECE 478	Methods	
ECE 480	Magnetic Resonance Imaging	3 or 4	ECE 480	Magnetic Resonance Imaging	3 or 4
ECE 481	Nanotechnology	4	ECE 481	Nanotechnology	4
ECE 482	Digital IC Design	3	ECE 482	Digital IC Design	3
ECE 483	Analog IC Design	3	ECE 483	Analog IC Design	3
ECE 485	MEMS Devices & Systems	3	ECE 485	MEMS Devices & Systems	3
ECE 486	Control Systems	4	ECE 486	Control Systems	4
ECE 487	Intro Quantum Electr for EEs	3	ECE 487	Intro Quantum Electr for EEs	3
ECE 488		3	ECE 488		3
ECE 489	Compound Semicond & Devices			Compound Semicond & Devices	
	Robot Dynamics and Control	4	ECE 489	Robot Dynamics and Control	4
ECE 490	Introduction to Optimization	3 or 4	ECE 490	Introduction to Optimization	3 or 4
ECE 491	Numerical Analysis	3 or 4	ECE 491	Numerical Analysis	3 or 4
ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4	ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4
ECE 493	Advanced Engineering Math	3 or 4	ECE 493	Advanced Engineering Math	3 or 4
ECE 495	Photonic Device Laboratory	3	ECE 495	Photonic Device Laboratory	3
ECE 496	Senior Research Project	2	ECE 496	Senior Research Project	2
ECE 499	Senior Thesis	2	ECE 499	Senior Thesis	2
1			ECE 298	Special Topics in ECE (As approved)	1 to 4
ECE 398	Special Topics in ECE (As approved)	0 to 4	ECE 398	Special Topics in ECE (As approved)	0 to 4
ECE 498	Special Topics in ECE (As approved)	0 to 4	ECE 498	Special Topics in ECE (As approved)	0 to 4
	Interdisciplinary Design Proj (CubeSat,			Interdisciplinary Design Proj (CubeSat,	
	Solar Decathlon, Formula SAE, Baja SAE	1 to 4		Solar Decathlon, Formula SAE, Baja SAI	E 1 to 4
ENC 404	or by approval)		ENIC 404	or by approval)	
ENG 491		,	ENG 491		
GEOL 107	Physical Geology	4	GEOL 107	Physical Geology	4
GEOL 208	History of the Earth System	4	GEOL 208	History of the Earth System	4
GEOL 333	Earth Materials and the Env	4	GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4	GEOL 380	Environmental Geology	4
GEOL 411	Structural Geol and Tectonics	4	GEOL 411	Structural Geol and Tectonics	4
GEOL 417	Geol Field Methods, Western US	6	GEOL 417	Geol Field Methods, Western US	6
GEOL 432	Mineralogy and Mineral Optics	4	GEOL 432	Mineralogy and Mineral Optics	4
GEOL 436	Petrology and Petrography	4	GEOL 436	Petrology and Petrography	4
GEOL 440	Sedimentology and Stratigraphy	4	GEOL 440	Sedimentology and Stratigraphy	4
		3		=: = : :	3
GEOL 450	Probing the Earth's Interior		GEOL 450	Probing the Earth's Interior	
GEOL 452	Introduction to Geophysics	4	GEOL 452	Introduction to Geophysics	4
GEOL 460	Geochemistry	3	GEOL 460	Geochemistry	3
	Deterministic Models in Optimization	3		Deterministic Models in Optimization	3
IE 310	Section in Section in Spanish and in Spanish	J	IE 310	beterministic models in optimization	J
IE 330	Industrial Quality Control	3	IE 330	Industrial Quality Control	3
IE 360	Facilities Planning and Design	3	IE 360	Facilities Planning and Design	3
IE 361	Production Planning & Control	3	IE 361	Production Planning & Control	3
IE 400	Design & Anlys of Experiments	3 or 4	IE 400	Design & Anlys of Experiments	3 or 4
12 400	Advanced Topics in Stochastic	3 01 4	12 400	Advanced Topics in Stochastic	3 01 4
IE 410		3 or 4	IE 410		3 or 4
IE 410	Processes & Applications		IE 410	Processes & Applications	
IE 411	Optimization of Large Systems	3 or 4	IE 411	Optimization of Large Systems	3 or 4
IE 412	OR Models for Mfg Systems	3 or 4	IE 412	OR Models for Mfg Systems	3 or 4
IE 413	Simulation	3 or 4	IE 413	Simulation	3 or 4
IE 420	Financial Engineering	3 or 4	IE 420	Financial Engineering	3 or 4
IE 430	Economic Found of Quality Syst	3 or 4	IE 430	Economic Found of Quality Syst	3 or 4
IE 431	Design for Six Sigma	3	IE 431	Design for Six Sigma	3
IB 150	Organismal & Evolutionary Biol	4	IB 150	Organismal & Evolutionary Biol	4
IB 202	Physiology	3 or 4	IB 202	Physiology	3 or 4
		4			4
IB 203	Ecology		IB 203	Ecology	
IB 204	Genetics	3 or 4	IB 204	Genetics	3 or 4
IB 302	Evolution	4	IB 302	Evolution	4
IB 335	Plant Systematics	4	IB 335	Plant Systematics	4
IB 348	Fish and Wildlife Ecology	3	IB 348	Fish and Wildlife Ecology	3
IB 368	Vertebrate Natural History	4	IB 368	Vertebrate Natural History	4
IB 401	Introduction to Entomology	3 or 4	IB 401	Introduction to Entomology	3 or 4
IB 405	Evolution of Traits and Genomes	3	IB 405	Evolution of Traits and Genomes	3
IB 420	Plant Physiology	3	IB 420	Plant Physiology	3
IB 421	Photosynthesis	3	IB 421	Photosynthesis	3
IB 426	Env and Evol Physl of Animals	3	IB 421	Env and Evol Physl of Animals	3
IB 427	Insect Physiology	4	IB 427	Insect Physiology	4
IB 431	Behavioral Ecology	3	IB 431	Behavioral Ecology	3
IB 432	Genes and Behavior	3	IB 432	Genes and Behavior	3
IB 440	Plants and Global Change	3	IB 440	Plants and Global Change	3
IB 443	Evolutionary Ecology	3	IB 443	Evolutionary Ecology	3
IB 444	Insect Ecology	3 or 4	IB 444	Insect Ecology	3 or 4
IB 451	Conservation Biology	4	IB 451	Conservation Biology	4
IB 452	Ecosystem Ecology	3	IB 452	Ecosystem Ecology	3
IB 453	Community Ecology	3	IB 453	Community Ecology	3
	Ornithology	4	IB 461	Ornithology	4
IB 461	OTHIGIOUGY			=:	
IB 461	Managedan	4	IB 462	Mammalogy	4
IB 462	Mammalogy		IB 463	Ichthyology	4
IB 462 IB 463	Ichthyology	4			
IB 462 IB 463 IB 464	Ichthyology Herpetology	4	IB 464	Herpetology	4
IB 462 IB 463 IB 464 IB 467	Ichthyology Herpetology Principles of Systematics	4 4	IB 467	Principles of Systematics	4
IB 462 IB 463 IB 464	Ichthyology Herpetology	4			
IB 462 IB 463 IB 464 IB 467	Ichthyology Herpetology Principles of Systematics	4 4	IB 467	Principles of Systematics	4
IB 462 IB 463 IB 464 IB 467 IB 468	Ichthyology Herpetology Principles of Systematics Insect Classification and Evol General Mycology	4 4 4	IB 467 IB 468	Principles of Systematics Insect Classification and Evol General Mycology	4
IB 462 IB 463 IB 464 IB 467 IB 468 IB 471 IB 472	Ichthyology Herpetology Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology	4 4 4 4	IB 467 IB 468 IB 471 IB 472	Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology	4 4 4 1
IB 462 IB 463 IB 467 IB 467 IB 471 IB 472 IB 473	Ichthyology Herpetology Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics	4 4 4 1 1	IB 467 IB 468 IB 471 IB 472 IB 473	Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics	4 4 4 1
IB 462 IB 463 IB 464 IB 467 IB 468 IB 471 IB 472 IB 473 IB 481	Ichthyology Herpetology Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases	4 4 4 1 1 4	IB 467 IB 468 IB 471 IB 472 IB 473 IB 481	Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases	4 4 4 1 1
IB 462 IB 463 IB 467 IB 467 IB 471 IB 472 IB 473	Ichthyology Herpetology Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics	4 4 4 1 1	IB 467 IB 468 IB 471 IB 472 IB 473	Principles of Systematics Insect Classification and Evol General Mycology Plant Molecular Biology Plant Genomics	4 4 4 1

B 485	Environ Toxicology & Health	3	IB 485	Environ Toxicology & Health	3
B 486	Pesticide Toxicology	3 or 4	IB 486	Pesticide Toxicology	3 or
NG 300	Anat & Physiol Spch Mechanism	4	LING 300	Anat & Physiol Spch Mechanism	4
	Introduction to Computational	2 4		Introduction to Computational	2
NG 406	Linguistics	3 or 4	LING 406	Linguistics	3 or
NG 407	Logic and Linguistic Analysis	3 or 4	LING 407	Logic and Linguistic Analysis	3 or
NG 427	Language and the Brain	3 or 4	LING 427	Language and the Brain	3 or
SE 280	Engineering Materials	3	MSE 280	Engineering Materials	3
	gineering (MSE): All 300 and 400 level courses	3		ngineering (MSE): All 300 and 400 level courses	3
ATH 213	Basic Discrete Mathematics	3		,	
ATH 347	Fundamental Mathematics	3	MATH 347	Fundamental Mathematics	3
ATH 348	Fundamental Mathematics-ACP	4	MATH 348	Fundamental Mathematics-ACP	4
ATH 357	Numerical Methods I	3	MATH 357	Numerical Methods I	3
ATH 402	Non Euclidean Geometry	3 or 4	MATH 402	Non Euclidean Geometry	3 or
ATH 403	Euclidean Geometry	3 or 4	MATH 403	Euclidean Geometry	3 or
ATH 412	Graph Theory	3 or 4	MATH 412	Graph Theory	3 or
ATH 413	Intro to Combinatorics	3 or 4	MATH 413	Intro to Combinatorics	3 or
ATH 414	Mathematical Logic	3 or 4	MATH 414	Mathematical Logic	3 or
ATH 416	Abstract Linear Algebra	3 or 4	<u> </u>		
ATH 417	Intro to Abstract Algebra	3 or 4	MATH 417	Intro to Abstract Algebra	3 or
ATH 418	Intro to Abstract Algebra II	3 or 4	MATH 418	Intro to Abstract Algebra II	3 or
ATH 423	Differential Geometry	3 or 4	MATH 423	Differential Geometry	3 01
ATH 424	Honors Real Analysis	3	MATH 424	Honors Real Analysis	3
ATH 425	Honors Advanced Analysis	3	MATH 425	Honors Advanced Analysis	3
ATH 427	Honors Abstract Algebra	3	MATH 427	Honors Abstract Algebra	3
ATH 427 ATH 428	Honors Topics in Mathematics	3	MATH 427		3
ATH 432	•	3 3 or 4	MATH 432	Honors Topics in Mathematics Set Theory and Topology	3 3 or
ATH 442	Set Theory and Topology Intro Partial Diff Equations	3 or 4	MATH 442	Intro Partial Diff Equations	3 or
	· ·			·	
ATH 444	Elementary Real Analysis	3 or 4	MATH 444	Elementary Real Analysis	3 01
ATH 446	Applied Complex Variables	3 or 4	MATH 446	Applied Complex Variables	3 01
ATH 447	Real Variables	3 or 4	MATH 447	Real Variables	3 or
ATH 448	Complex Variables	3 or 4	MATH 448	Complex Variables	3 or
ATH 450	Numerical Analysis	3 or 4	MATH 450	Numerical Analysis	3 01
ATH 453	Number Theory	3 or 4	MATH 453	Number Theory	3 or
ATH 473	Algorithms	4	MATH 473	Algorithms	4
ATH 475	Formal Models of Computation	3 or 4	MATH 475	Formal Models of Computation	3 or
ATH 481	Vector and Tensor Analysis	3 or 4	MATH 481	Vector and Tensor Analysis	3 01
ATH 482	Linear Programming	3 or 4	MATH 482	Linear Programming	3 or
ATH 484	Nonlinear Programming	3 or 4	MATH 484	Nonlinear Programming	3 or
ATH 487	Advanced Engineering Math	3 or 4	MATH 487	Advanced Engineering Math	3 or
ATH 489	Dynamics & Differential Eqns	3 or 4	MATH 489	Dynamics & Differential Eqns	3 01
CB 150	Molec & Cellular Basis of Life	4	MCB 150	Molec & Cellular Basis of Life	4
ICB 250	Molecular Genetics	3	MCB 250	Molecular Genetics	3
ICB 251	Exp Techniqs in Molecular Biol	2	MCB 251	Exp Techniqs in Molecular Biol	2
ICB 252	Cells, Tissues & Development	3	MCB 252	Cells, Tissues & Development	3
CB 253	Exp Techniqs in Cellular Biol	2	MCB 253	Exp Techniqs in Cellular Biol	2
ICB 300	Microbiology	3	MCB 300	Microbiology	3
ICB 301	Experimental Microbiology	3	MCB 301	Experimental Microbiology	3
ICB 314	Introduction to Neurobiology	3	MCB 314	Introduction to Neurobiology	3
ICB 316	Genetics and Disease	4	MCB 316	Genetics and Disease	4
1CB 354	Biochem & Phys Basis of Life	3	MCB 354	Biochem & Phys Basis of Life	3
CB 400	Cancer Cell Biology	3	MCB 400	Cancer Cell Biology	3
ICB 401	=:	3		=:	3
	Cellular Physiology		MCB 401	Cellular Physiology	
CB 402	Sys & Integrative Physiology	3	MCB 402	Sys & Integrative Physiology	3
ICB 403	Cell & Membrane Physiology Lab	1 or 2	MCB 403	Cell & Membrane Physiology Lab	1 or
ICB 404	Sys & Integrative Physiol Lab	1 to 2	MCB 404	Sys & Integrative Physiol Lab	1 to
CB 406	Gene Expression & Regulation	3	MCB 406	Gene Expression & Regulation	3
CB 408	Immunology	3	MCB 408	Immunology	3
	Developmental Biology, Stem Cells ar	nd 3		Developmental Biology, Stem Cells an	d 3
CB 410	Regenerative Medicine	,	MCB 410	Regenerative Medicine	э
ICB 413	Endocrinology	3	MCB 413	Endocrinology	3
CB 419	Brain, Behavior & Info Process	3	MCB 419	Brain, Behavior & Info Process	3
CB 421	Microbial Genetics	3	MCB 421	Microbial Genetics	3
CB 424	Microbial Biochemistry	3	MCB 424	Microbial Biochemistry	3
CB 426	Bacterial Pathogenesis	3	MCB 426	Bacterial Pathogenesis	3
CB 430	Molecular Microbiology	3	MCB 430	Molecular Microbiology	3
CB 431		3	MCB 431	Microbial Physiology	
	Microbial Physiology			, 0,	3
CB 433	Virology & Viral Pathogenesis	3	MCB 433	Virology & Viral Pathogenesis	3
CB 435	Evolution of Infectious Disease	3	MCB 435	Evolution of Infectious Disease	3
CB 446	Physical Biochemistry	3	MCB 446	Physical Biochemistry	3
CB 480	Eukaryotic Cell Signaling	3	MCB 480	Eukaryotic Cell Signaling	3
E 200	Thermodynamics	3	ME 200	Thermodynamics	3
E 310	Fundamentals of Fluid Dynamics	4	ME 310	Fundamentals of Fluid Dynamics	4
E 320	Heat Transfer	4	ME 320	Heat Transfer	4
E 330	Engineering Materials	4	ME 330	Engineering Materials	4
E 340	Dynamics of Mechanical Systems	3.5	ME 340	Dynamics of Mechanical Systems	3.5
E 370	Mechanical Design I	3	ME 370	Mechanical Design I	3
E 371	Mechanical Design II	3	ME 371	Mechanical Design II	3
E 400	_	3 or 4	ME 400	_	3 or
	Energy Conversion Systems			Energy Conversion Systems	
E 401	Refrigeration and Cryogenics	3 or 4	ME 401	Refrigeration and Cryogenics	3 01
E 402	Design of Thermal Systems	3 or 4	ME 402	Design of Thermal Systems	3 01
	Internal Combustion Engines	3 or 4	ME 403	Internal Combustion Engines	3 01
	Intermediate Thermodynamics	4	ME 404	Intermediate Thermodynamics	4
	Intermediate Gas Dynamics	3 or 4	ME 410	Intermediate Gas Dynamics	3 01
E 404			ME 411	Viscous Flow & Heat Transfer	4
E 404 E 410	Viscous Flow & Heat Transfer	4			
E 404 E 410 E 411				Numerical Thermo-Fluid Mechs	2 to
IE 404 IE 410 IE 411 IE 412	Numerical Thermo-Fluid Mechs	2 to 4	ME 412	Numerical Thermo-Fluid Mechs Intermediate Heat Transfer	
1E 404 1E 410 1E 411 1E 412 1E 420	Numerical Thermo-Fluid Mechs Intermediate Heat Transfer	2 to 4 4	ME 412 ME 420	Intermediate Heat Transfer	2 to 4
NE 403 NE 404 NE 410 NE 411 NE 412 NE 420 NE 430 NE 431	Numerical Thermo-Fluid Mechs	2 to 4	ME 412		

ME 445 ME 450	Introduction to Robotics	4	ME 445 Introduction to Robotics	4
450 451	Course ME 450 Not Found Computer-Aided Mfg Systems	3 or 4	ME 451 Computer-Aided Mfg Systems	3 or 4
452	Num Control of Mfg Processes	3 or 4	ME 452 Num Control of Mfg Processes	3 or 4
IE 460	Industrial Control Systems	4	ME 460 Industrial Control Systems	4
ИЕ 461	Computer Cntrl of Mech Systems	3 or 4	ME 461 Computer Cntrl of Mech Systems	3 or 4
NE 471	Finite Element Analysis	3 or 4	ME 471 Finite Element Analysis	3 or 4
ME 472	Introduction to Tribology	3 or 4	ME 472 Introduction to Tribology	3 or 4
ME 485	MEMS Devices & Systems	3	ME 485 MEMS Devices & Systems	3
ИЕ 487	MEMS-NEMS Theory & Fabrication	4	ME 487 MEMS-NEMS Theory & Fabrication	4
1US 407	Elect Music Techniques I	3	MUS 407 Elect Music Techniques I	3
IUS 409	Elec Music Techniques II	2	MUS 409 Elec Music Techniques II	2
NEUR 453	Cog Neuroscience of Vision	3 or 4	NEUR 453 Cog Neuroscience of Vision	3 or 4
NPRE 201	Energy Systems	2 or 3	NPRE 201 Energy Systems	2 or 3
IPRE 247	Modeling Nuclear Energy System	3	NPRE 247 Modeling Nuclear Energy System	3
NPRE 402	Nuclear Power Engineering	3 or 4	NPRE 402 Nuclear Power Engineering	3 or 4
IPRE 412	Nuclear Power Econ & Fuel Mgmt	3 or 4	NPRE 412 Nuclear Power Econ & Fuel Mgmt NPRE 421 Plasma and Fusion Science	3 or 4 3
NPRE 421 NPRE 423	Plasma and Fusion Science Plasma Laboratory	3 2	NPRE 421 Plasma and Fusion Science NPRE 423 Plasma Laboratory	2
IPRE 429	Plasma Engineering	3	NPRE 429 Plasma Engineering	3
PRE 431	Materials in Nuclear Engrg	3	NPRE 431 Materials in Nuclear Engrg	3
PRE 432	Nuclear Engrg Materials Lab	2	NPRE 432 Nuclear Engrg Materials Lab	2
IPRE 435	Radiological Imaging	3	NPRE 435 Radiological Imaging	3
IPRE 441	Radiation Protection	4	NPRE 441 Radiation Protection	4
PRE 442	Radioactive Waste Management	3	NPRE 442 Radioactive Waste Management	3
PRE 444	Nuclear Analytical Methods Lab	2 or 3	NPRE 444 Nuclear Analytical Methods Lab	2 or 3
PRE 446	Radiation Interact w/Matter I	3	NPRE 446 Radiation Interact w/Matter I	3
PRE 447	Radiation Interact w/Matter II	3	NPRE 447 Radiation Interact w/Matter II	3
PRE 448	Nuclear Syst Engrg & Design	4	NPRE 448 Nuclear Syst Engrg & Design	4
PRE 451	NPRE Laboratory	3	NPRE 451 NPRE Laboratory	3
PRE 455	Neutron Diffusion & Transport	4	NPRE 455 Neutron Diffusion & Transport	4
PRE 457	Safety Anlys Nucl Reactor Syst	3 or 4	NPRE 457 Safety Anlys Nucl Reactor Syst	3 or 4
PRE 458	Design in NPRE	4	NPRE 458 Design in NPRE	4
PRE 470	Fuel Cells & Hydrogen Sources	3	NPRE 470 Fuel Cells & Hydrogen Sources	3
PRE 475	Wind Power Systems	3 or 4	NPRE 475 Wind Power Systems	3 or 4
IYS 225	Relativity & Math Applications	2	PHYS 225 Relativity & Math Applications	2
HYS 325	Classical Mechanics I	3	PHYS 325 Classical Mechanics I	3
YS 326	Classical Mechanics II	3	PHYS 326 Classical Mechanics II	3
YS 401	Classical Physics Lab	3	PHYS 401 Classical Physics Lab	3
IYS 402	Light	3 or 4	PHYS 402 Light	3 or 4
IYS 403	Modern Experimental Physics	4 or 5	PHYS 403 Modern Experimental Physics	4 or 5
IYS 406	Acoustical Physics of Music	4	PHYS 406 Acoustical Physics of Music	4
IYS 419	Space, Time, and Matter-ACP	3 or 4	PHYS 419 Space, Time, and Matter-ACP	3 or 4
IYS 420	Space, Time, and Matter	2	PHYS 420 Space, Time, and Matter	2
YS 427	Thermal & Statistical Physics	4	PHYS 427 Thermal & Statistical Physics	4
YS 460	Condensed Matter Physics	4	PHYS 460 Condensed Matter Physics	4
/S 466	Atomic Scale Simulations	3 or 4	PHYS 466 Atomic Scale Simulations	3 or 4
/S 470	Subatomic Physics	4	PHYS 470 Subatomic Physics	4
YS 485	Atomic Phys & Quantum Theory	3	PHYS 485 Atomic Phys & Quantum Theory	3
YS 486	Quantum Physics I	4	PHYS 486 Quantum Physics I	4
YS 487	Quantum Physics II	4	PHYS 487 Quantum Physics II	4
′C 204	Intro to Brain and Cognition	3	PSYC 204 Intro to Brain and Cognition	3
5 200	General Phonetics	3	SHS 200 General Phonetics	3
5 240	Intro Sound & Hearing Science	3	SHS 240 Intro Sound & Hearing Science	3
300	Anat & Physiol Spch Mechanism	4	SHS 300 Anat & Physiol Spch Mechanism	4
S 301	General Speech Science	4	SHS 301 General Speech Science	4
320	Development of Spoken Language	3	SHS 320 Development of Spoken Language	3
IS 450	Intro Audiol & Hear Disorders	4	SHS 450 Intro Audiol & Hear Disorders	4
IS 470	Neural Bases Spch Lang	4	SHS 470 Neural Bases Spch Lang	4
AT 420	Methods of Applied Statistics	3 or 4	STAT 420 Methods of Applied Statistics	3 or 4
AT 424	Analysis of Variance	3 or 4	STAT 424 Analysis of Variance	3 or 4
T 420	Sheatled Co	2	Statistical Modeling I	3 or 4
T 428	Statistical Computing	3 or 4	STAT 428 Statistical Computing	3 or 4
AT 429	Time Series Analysis	3 or 4	STAT 440 Time Series Analysis	3 or 4
T 440	Statistical Data Management	3 or 4	STAT 440 Statistical Data Management	3 or 4
111	Reliability Engineering	3 or 4	SE 411 Reliability Engineering	3 or 4
120 123	Digital Control Systems	4	SE 420 Digital Control Systems SE 423 Mechatronics	4
	Mechatronics	3		3
424 И 211	State Space Design for Control	3	SE 424 State Space Design for Control TAM 211 Statics	3
	Statics Introductory Dynamics	3	TAM 211 Statics TAM 212 Introductory Dynamics	3
M 212 M 251	Introductory Dynamics Introductory Solid Mechanics	3	TAM 212 Introductory Dynamics TAM 251 Introductory Solid Mechanics	3
	15	4	The state of the s	
M 324 M 335	Behavior of Materials			4
	Introductory Fluid Mechanics Intermediate Dynamics	4	TAM 335 Introductory Fluid Mechanics	4
M 412 M 425	•	4	TAM 412 Intermediate Dynamics	4
M 435	Intermediate Fluid Mechanics Continuum Mechanics	4	TAM 435 Intermediate Fluid Mechanics TAM 445 Continuum Mechanics	4 4
M 445 M 451	Intermediate Solid Mechanics	4	TAM 445 Continuum Mechanics TAM 451 Intermediate Solid Mechanics	4
	ally approved list of EE Foundations	7	Select one course from the following list of Electrical Engineering	-4
urses	, approved not of LE roulludtions		Foundation Courses	
E 310	Digital Signal Processing	3	ECE 310 Digital Signal Processing	3
CE 330	Power Ckts & Electromechanics	3	ECE 330 Power Ckts & Electromechanics	3
	Fields and Waves I	3	ECE 329 Fields and Waves I	3
	Semiconductor Electronics	3	ECE 329 Fields and waves I ECE 340 Semiconductor Electronics	3
		3	ECE 461 Digital Communications	3
E 329 E 340 E 461			Digital Communications	
340 461	Digital Communications		FCF 486 Control Systems	Λ
340 461 486	Control Systems	4	ECE 486 Control Systems	4
340 461 486 e courses from departme	=		Select three courses from the following list of Advanced Computing	4
340 461 486	Control Systems			3

CS 412	Introduction to Data Mining	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
CS 421	Programming Languages & Compilers	3 or 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 431	Embedded Systems	3 or 4
1		
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 440	Artificial Intelligence	3 or 4
CS 446	Machine Learning	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 461	Computer Security I	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
00.477	Formal Software Development	3 or 4
CS 477	Methods	4
CS 483	Applied Parallel Programming	4
CS 498	Special Topics (MP: Logic for Computer Science)	1 to 4
CS 498	Special Topics (VR: Virtual Reality)	1 to 4
63 136	Special Topics (AML: Applied Machine	
CS 498	Learning)	1 to 4
ECE 408	Applied Parallel Programming	4
ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3
ECE 419	Security Laboratory	3 or 4
ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3
ECE 428	Distribute of Contains	
	Distributed Systems	3 or 4
ECE 435	Computer Networking Laboratory	3 or 4 3 or 4
ECE 435 ECE 438	•	
	Computer Networking Laboratory	3 or 4
ECE 438	Computer Networking Laboratory Communication Networks	3 or 4 3 or 4
ECE 438 ECE 439	Computer Networking Laboratory Communication Networks Wireless Networks	3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence	3 or 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics	3 or 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods	3 or 4 3 or 4 3 or 4 3 or 4 3 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 ECE 491	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods	3 or 4 3 or 4 3 or 4 3 or 4 3 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 ECE 491	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis	3 or 4 3 or 4 3 or 4 3 or 4 3 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 CEE 491 ECE 492	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 ECE 491 ECE 492	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg Special Topics in ECE (RC: Smart Phone Computing and Applications)	3 or 4 3 or 4 3 or 4 3 or 4 3 4 3 or 4 3 or 4 3 or 4
ECE 438 ECE 439 ECE 448 ECE 470 ECE 478 ECE 491 ECE 492 ECE 498 One course from departmentall	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg Special Topics in ECE (RC: Smart Phone Computing and Applications) y approved list below:	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 0 to 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 ECE 491 ECE 492 ECE 492 ECE 491 ECE 491	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg Special Topics in ECE (RC: Smart Phone Computing and Applications) y approved list below: Computer Organization & Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 0 to 4
ECE 438 ECE 439 ECE 448 ECE 470 ECE 478 ECE 491 ECE 492 ECE 498 One course from departmentall	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg Special Topics in ECE (RC: Smart Phone Computing and Applications) y approved list below: Computer Organization & Design Senior Design Project Lab ⁶	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 0 to 4
ECE 438 ECE 439 ECE 448 ECE 462 ECE 470 ECE 478 ECE 491 ECE 492 ECE 491 ECE 491	Computer Networking Laboratory Communication Networks Wireless Networks Artificial Intelligence Logic Synthesis Introduction to Robotics Formal Software Development Methods Numerical Analysis Parallel Progrmg: Sci & Engrg Special Topics in ECE (RC: Smart Phone Computing and Applications) y approved list below: Computer Organization & Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 0 to 4

Electives	
Gen Ed (SBS + HA + Comp I)	16
The Grainger College of Engineering Liberal Education course list, or	
additional courses from the campus General Education lists for Social and	6
Behavioral Sciences or Humanities and the Arts ⁷	
Free electives. Additional unrestricted course work, subject to certain	12

Total Hours of Curriculum to Graduate

1 External transfer students take

ENG 300 instead.

MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

- ³ Freshmen take ECE 110 for 3 credit hours. Lab-only version taken by transfer students (with special permission) is 1 credit hour.
- ⁴ MATH 213 may be substituted.
- ⁵ STAT 410 may be substituted.
- Advanced Composition may be satisfied by completing ECE 445 or ECE 496 and ECE 499 or a course within either the general education or free elective categories which has the Advanced Composition designation.

CS 412	Introduction to Data Mining	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
		3 or 4
CS 421	Programming Languages & Compilers	3 01 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 431	Embedded Systems	3 or 4
CS 441	Applied Machine Learning	3 or 4
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 440	Artificial Intelligence	3 or 4
CS 446	Machine Learning	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 461	Computer Security I	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
	Formal Software Development	3 or 4
CS 477	Methods	3 01 4
CS 483	Applied Parallel Programming	4
ECE 408 ECE 411 ECE 412	Applied Parallel Programming Computer Organization & Design Microcomputer Laboratory	4 4 3
ECE 419	Security Laboratory	3 or 4
ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3
ECE 428	Distributed Systems	3 or 4
ECE 435	Computer Networking Laboratory	3 or 4
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 448	Artificial Intelligence	3 or 4
ECE 462	Logic Synthesis	3
ECE 470	Introduction to Robotics	4
	Formal Software Development	
ECE 478	Methods	3 or 4
ECE 484	Principles of Safe Autonomy	4
ECE 491	Numerical Analysis	3 or 4
ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4
Select one from the following lis		
ECE 411	Computer Organization & Design	4
ECE 445	Senior Design Project Lab ⁶	4
	Senior Research Project (and ECE 499 -	4
ECE 496	Senior Thesis) 6	4

Electives
Gen Ed (SBS + HA + Comp I)
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts ⁷
Free electives. Additional unrestricted course work, subject to certain

Total Hours of Curriculum to Graduate

128

128

¹ External transfer students take ENG 300 instead.

MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

- ³ Freshmen take ECE 110 for 3 credit hours. Lab-only version taken by transfer students (with special permission) is 1 credit hour.
- ⁴ MATH 213 may be substituted.
- ⁵ STAT 410 may be substituted.
- Advanced Composition may be satisfied by completing ECE 445 or ECE 496 and ECE 499 or a course within either the general education or free elective categories which has the Advanced Composition designation.

- The Grainger College of Engineering approved liberal education course list can be found here. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.
- ⁸ The Grainger College of Engineering restrictions to free electives can be found here.

- The Grainger College of Engineering approved liberal education course list can be found here. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.
- ⁸ The Grainger College of Engineering restrictions to free electives can be found here.

10KP0115BS: ELECTRICAL ENGINEERING, BS

Completed Workflow

- 1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)
- 2. 1933 Head (b-hajek@illinois.edu; oelze@illinois.edu; erhan@illinois.edu)
- 3. KP Committee Chair (bsnewell@illinois.edu; kcp@illinois.edu; jmakela@illinois.edu; amccul2@illinois.edu; bodony@illinois.edu)
- 4. KP Dean (candyd@illinois.edu)
- 5. University Librarian (jpwilkin@illinois.edu)
- 6. Provost (kmartens@illinois.edu)
- 7. Senate EPC (bjlehman@illinois.edu; moorhouz@illinois.edu; kmartens@illinois.edu)
- 8. Senate (jtempel@illinois.edu)
- 9. U Senate Conf (none)
- 10. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

Approval Path

1. Wed, 24 Feb 2021 21:59:29 GMT

Deb Forgacs (dforgacs): Approved for U Program Review

2. Wed, 24 Feb 2021 22:01:23 GMT

Erhan Kudeki (erhan): Approved for 1933 Head

3. Tue, 09 Mar 2021 19:48:51 GMT

Brooke Newell (bsnewell): Approved for KP Committee Chair

4. Tue, 09 Mar 2021 19:51:08 GMT

Candy Deaville (candyd): Approved for KP Dean

5. Tue, 09 Mar 2021 20:22:25 GMT

John Wilkin (jpwilkin): Approved for University Librarian

6. Wed, 10 Mar 2021 21:48:25 GMT

Kathy Martensen (kmartens): Rollback to KP Dean for Provost

7. Wed, 10 Mar 2021 21:52:01 GMT

Candy Deaville (candyd): Rollback to KP Committee Chair for KP Dean

8. Thu, 18 Mar 2021 20:24:12 GMT

Brooke Newell (bsnewell): Approved for KP Committee Chair

9. Thu, 18 Mar 2021 20:29:34 GMT

Candy Deaville (candyd): Approved for KP Dean

10. Thu, 18 Mar 2021 20:31:37 GMT

John Wilkin (jpwilkin): Approved for University Librarian

11. Mon, 22 Mar 2021 19:01:54 GMT

Kathy Martensen (kmartens): Approved for Provost

12. Wed, 31 Mar 2021 20:53:23 GMT

Barbara Lehman (bjlehman): Approved for Senate EPC

13. Thu, 08 Apr 2021 19:11:03 GMT

Jennifer Roether (jtempel): Approved for Senate

14. Thu, 15 Apr 2021 22:32:01 GMT

Kathy Martensen (kmartens): Approved for U Senate Conf

15. Mon, 19 Apr 2021 16:12:48 GMT

Emily Stuby (eastuby): Approved for DMI

History

- 1. Apr 23, 2019 by Deb Forgacs (dforgacs)
- 2. Aug 12, 2019 by Deb Forgacs (dforgacs)
- 3. Feb 26, 2020 by Brooke Newell (bsnewell)
- 4. Mar 31, 2020 by Deb Forgacs (dforgacs)
- 5. Apr 14, 2020 by Deb Forgacs (dforgacs)
- 6. Apr 19, 2021 by Erhan Kudeki (erhan)

Date Submitted:Fri, 17 Sep 2021 16:10:08 GMT Viewing:10KP0115BS: Electrical Engineering, BS Changes proposed by: Erhan Kudeki Proposal Type: Major (ex. Special Education) This proposal is for a: Revision **Administration Details** Official Program Name Electrical Engineering, BS **Sponsor College Grainger College of Engineering Sponsor Department Electrical and Computer Engineering Sponsor Name** Erhan Kudeki **Sponsor Email** erhan@illinois.edu **College Contact** Brooke Newell **College Contact Email** bsnewell@illinois.edu Does this program have inter-departmental administration?

Proposal Title

Effective Catalog Term

No

Provide a brief, concise description (not justification) of your proposal.

Administrative approval: Updating the course list related to Technical Electives, numerically ordering the MATH courses in the Foundational Mathematics and Science courses, and providing clarifying language.

Program Justification

Why are these changes necessary?

Update requested by the College to make corrections related to Technical Electives.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

Nο

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

EE BS program is ABET Accredited.

The Program Educational Objectives of the EE program presented to ABET is as follows:

The University of Illinois Electrical Engineering program will produce graduates having the choice, talents, and knowledge to:

- 1. Pursue a diverse range of careers as engineers, consultants, and entrepreneurs.
- 2. Continue their education in leading graduate programs in engineering and interdisciplinary areas to emerge as researchers, experts, and educators.
- 3. Learn and create new knowledge in ever-changing environments of the 21st century, and communicate their work and ideas to colleagues and the public at large.
- 4. Practice and inspire high ethical and technical standards, and lead their professional disciplines, organizations, and communities globally.

All four of these objectives require a student to possess all seven of the skills listed as Student Outcomes of our program (see below). The particular career paths listed in the first two objectives are engineers, consultants, entrepreneurs — reachable directly after the B.S. degree — as well as researchers, experts, and educators, typically for those graduates who choose to continue their education in some graduate program. Each of these six career choices will critically depend on students acquiring all seven of the particular skills enumerated as Student Outcomes, namely:

- 1. (Principles) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 2. (Design) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- 3. (Communication) an ability to communicate effectively with a range of audiences.
- 4. (Professionalism) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

- 5. (Teamwork) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- 6. (Analysis) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- 7. (Learning) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Student's achievement of these objectives and outcomes are monitored and assessed using using a strategy that depends on Self-Assessment reports written by ECE instructors and course directors as well as student and alumni surveys.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs

Electrical Engineering BS_Minor Revision_Side by Side Table.xlsx

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text - Overview Tab

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

Electrical engineering is a multifaceted discipline that over the last century has produced an astounding progression of technological innovations that have shaped virtually every aspect of modern life. Electrical engineers need a broad and solid foundation in mathematics and physics to support their education in the engineering principles of analysis, synthesis, design, implementation, and testing of the devices and systems that provide the bedrock of modern energy, communication, sensing, computing, medical, security, and defense infrastructures. Within each subdiscipline one can find application domains that strongly rely on hands-on experimental work or that are based on theoretical, mathematical and computational approaches. The multidisciplinary nature of the electrical engineering education addresses the growing demand for the innovation and design of sensing, communication, computing, and decision-making systems of increasing complexity in consumer, defense, and medical applications.

The curriculum starts with a core of fundamental courses on circuits, electromagnetics, solid-state electronics, and computer systems, leading to a comprehensive array of specialized courses and laboratories in all of the important areas of modern electrical engineering.

Statement for Programs of Study Catalog

Graduation Requirements

Minimum Technical GPA (https://go.grainger.illinois.edu/TechnicalGPA/):2.0

TGPA is required for ECE courses (except ECE 316). SeeTechnical GPA (https://go.grainger.illinois.edu/TechnicalGPA/)to clarify requirements.

Minimum Overall GPA:2.0

Minimum hours required for graduation:128 hours

General education:Students must complete the Campus General Education (https://courses.illinois.edu/gened/DEFAULT/
DEFAULT/)requirements including the campus general education language requirement. Specific Advanced Composition courses required for this degree are listed below.

Orientation and Professional Development

Code	Title	Hours
ENG 100	Engineering Orientation ¹	0
Total Hours		

Foundational Mathematics and Science

Code	Title	Hours
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
MATH 221	Calculus I ²	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 257	Linear Algebra with Computational Applications (Linear Algebra)	3
or MATH 416	Abstract Linear Algebra	
MATH 285	Intro Differential Equations	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		33

Electrical Engineering Technical Core

Code	Title	Hours
ECE 110	Introduction to Electronics ³	3
ECE 120	Introduction to Computing	4
ECE 220	Computer Systems & Programming	4
ECE 210	Analog Signal Processing	4
ECE 313	Probability with Engrg Applic ⁴	3
ECE 329	Fields and Waves I	3
ECE 340	Semiconductor Electronics	3
ECE 385	Digital Systems Laboratory	3
ECE 445	Senior Design Project Lab ^{5,6}	4
Total Hours		31

Technical Electives

Teomitour Electives			
Code	Title	Hours	
30 hours, to include:			
	of Technical Electives, to include:at least 6 hours of non-ECE electives, at least 20 hours of Core Electives, at least 3 ECE Labs, where at least one must be a Hardware Lab	30	
Non-ECE courses from list below:		6	
AE 202	Aerospace Flight Mechanics	3	
AE 302	Aerospace Flight Mechanics II	3	
AE 311	Incompressible Flow	3	
AE 312	Compressible Flow	3	
AE 321	Mechs of Aerospace Structures	3	
AE 352	Aerospace Dynamical Systems	3	
AE 353	Aerospace Control Systems	3	
AE 402	Orbital Mechanics	3 or 4	

AE 403	Spacegraft Attitude Central	3 or 4
AE 410	Spacecraft Attitude Control	3 or 4
AE 412	Computational Aerodynamics Viscous Flow & Heat Transfer	3 01 4
AE 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AE 427	Course AE 427 Not Found	3 01 4
AE 428	Mechanics of Composites	3
AE 433	·	3 or 4
AE 434	Aerospace Propulsion Rocket Propulsion	3 or 4
AE 435	Electric Propulsion	3 or 4
AE 451		3 or 4
AE 460	Aeroelasticity	
	Aerodynamics & Propulsion Lab	2
reviewed in the Advising Office	evel courses exceptABE 440. Except seminars and special topics courses, which may be	
ASTR 210	Introduction to Astrophysics	3
ASTR 310	Computing in Astronomy	3
ASTR 330	Extraterrestrial Life	3
ASTR 350	The Big Bang, Black Holes, and the End of the Universe	3
ASTR 404	Stellar Astrophysics	3
ASTR 405	Planetary Systems	3
ASTR 406	Galaxies and the Universe	3
ASTR 414	Astronomical Techniques	4
ASTR 450	Astrochemistry	4
ATMS 201	General Physical Meteorology	3
ATMS 301	Atmospheric Thermodynamics	3
ATMS 302	Atmospheric Dynamics I	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4
ATMS 304	Radiative Transfer-Remote Sens	3
ATMS 305	Computing and Data Analysis	3
ATMS 404	Risk Analysis in Earth Science	3 or 4
ATMS 405	Boundary Layer Processes	4
ATMS 406	Tropical Meteorology	4
ATMS 410	Radar Remote Sensing	4
ATMS 411	Satellite Remote Sensing	4
ATMS 420	Atmospheric Chemistry	4
ATMS 421	Earth Systems Modeling	4
ATMS 425	Course ATMS 425 Not Found	
ATMS 447	Climate Change Assessment	3
ATMS 449	Biogeochemical Cycles	4
BIOC 406	Gene Expression & Regulation	3
BIOC 440	Physical Chemistry Principles	4
BIOC 446	Physical Biochemistry	3
BIOC 455	Technqs Biochem & Biotech	4
BIOE 201	Conservation Principles Bioeng	3
BIOE 202	Cell & Tissue Engineering Lab	2
BIOE 302	Modeling Human Physiology	3
BIOE 414	Biomedical Instrumentation	3
BIOE 415	Biomedical Instrumentation Lab	2
BIOE 461	Cellular Biomechanics	4
BIOE 467	Biophotonics	3
BIOE 476	Tissue Engineering	3

BIOE 480	Magnetic Resonance Imaging	3 or 4
BIOE 485	Computational Mathematics for Machine Learning and Imaging	4
Biophysics (BIOP): All 400 level cou Office.	rses except seminars and special topics courses, which may be reviewed in the Advising	
CHBE 221	Principles of CHE	3
CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
CHBE 430	Unit Operations Laboratory	4
CHBE 431	Process Design	4
CHBE 440	Process Control and Dynamics	3
CHBE 451	Transport Phenomena	3
CHBE 452	Chemical Kinetics & Catalysis	3
CHBE 453	Electrochemical Engineering	2 or 3
CHBE 456	Polymer Science & Engineering	3
CHBE 457	Microelectronics Processing	3
CHBE 471	Biochemical Engineering	3 or 4
CHBE 472	Techniques in Biomolecular Eng	3 or 4
CHBE 473	Biomolecular Engineering	3 or 4
CHBE 474	Metabolic Engineering	3 or 4
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
Chemistry (CHEM): All 200, 300 and	400 level except 397, 497, and 499. Exceptions also include seminars and special topics,	
which may be reviewed in the Advis		
CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 430	Ecological Quality Engineering	2
CEE 447	Atmospheric Chemistry	4
CEE 491	Decision and Risk Analysis	3 or 4
CPSC 265	Genetic Engineering Lab	3
CS 101	Intro Computing: Engrg & Sci (By Approval)	3
CS 173	Discrete Structures	3
CS 225	Data Structures	4
CS 242	Programming Studio	3
CS 357	Numerical Methods I	3
CS 410	Text Information Systems	3 or 4
CS 411	Database Systems	3 or 4
CS 412	Introduction to Data Mining	3 or 4
CS 413	Intro to Combinatorics	3 or 4
CS 414	Multimedia Systems	3 or 4
CS 416	Data Visualization	3 or 4
CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
CS 421	Programming Languages & Compilers	3 or 4
CS 422	Programming Language Design	3 or 4
CS 423	Operating Systems Design	3 or 4
CS 424	Real-Time Systems	3 or 4
		0 0. 1

CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4
CS 427	Software Engineering I	3 or 4
CS 428	Software Engineering II	3 or 4
CS 429	Software Engineering II, ACP	3
CS 431	Embedded Systems	3 or 4
CS 433	Computer System Organization	3 or 4
CS 435	Cloud Networking	3 or 4
CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4
CS 439	Wireless Networks	3 or 4
CS 440	Artificial Intelligence	3 or 4
CS 441	Applied Machine Learning	3 or 4
CS 445	Computational Photography	3 or 4
CS 446	Machine Learning	3 or 4
CS 447	Natural Language Processing	3 or 4
CS 450	Numerical Analysis	3 or 4
CS 460	Security Laboratory	3 or 4
CS 461	Computer Security I	4
CS 463	Computer Security II	3 or 4
CS 465	User Interface Design	4
CS 466	Introduction to Bioinformatics	3 or 4
CS 467	Social Visualization	3 or 4
CS 473	Algorithms	4
CS 475	Formal Models of Computation	3 or 4
CS 476	Program Verification	3 or 4
CS 477	Formal Software Development Methods	3 or 4
CS 481	Advanced Topics in Stochastic Processes & Applications	3 or 4
CS 484	Parallel Programming	3 or 4
CS 398	Special Topics (As Approved)	1 to 4
CS 498	Special Topics (As Approved)	1 to 4
ECE 297	Individual Study	1
ECE 304	Photonic Devices	3
ECE 307	Techniques for Engrg Decisions	3
ECE 310	Digital Signal Processing	3
ECE 311	Digital Signal Processing Lab	1
ECE 314	Probability in Engineering Lab	1
ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3
ECE 333	Green Electric Energy	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	3
ECE 343	Electronic Circuits Laboratory	1
ECE 350	Fields and Waves II	3
ECE 365	Data Science and Engineering	3
ECE 374	Introduction to Algorithms & Models of Computation	4
ECE 380	Biomedical Imaging	3
ECE 391	Computer Systems Engineering	4
ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 396	Honors Project	1 to 4
ECE 397	Individual Study in ECE	0 to 4
ECE 402	Electronic Music Synthesis	3

ECE 403	Audio Engineering	3
ECE 407	Cryptography	3 or 4
ECE 408	Applied Parallel Programming	4
ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3
ECE 414	Biomedical Instrumentation	3
ECE 415	Biomedical Instrumentation Lab	2
ECE 416	Biosensors	3
ECE 417	Multimedia Signal Processing	4
ECE 418	Image & Video Processing	4
ECE 419	Security Laboratory	3 or 4
ECE 420	Embedded DSP Laboratory	2
ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3
ECE 428	Distributed Systems	3 or 4
ECE 431	Electric Machinery	4
ECE 432	Advanced Electric Machinery	3
ECE 435	Computer Networking Laboratory	3 or 4
ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 441	Physcs & Modeling Semicond Dev	3
ECE 442	Silicon Photonics	3 or 4
ECE 443	LEDs and Solar Cells	4
ECE 444	IC Device Theory & Fabrication	4
ECE 445	Senior Design Project Lab	4
ECE 446	Principles of Experimental Research in Electrical Engineering	4
ECE 447	Active Microwave Ckt Design	3
ECE 448	Artificial Intelligence	3 or 4
ECE 451	Adv Microwave Measurements	3
ECE 452	Electromagnetic Fields	3
ECE 453	Wireless Communication Systems	4
ECE 454	Antennas	3
ECE 455	Optical Electronics	3 or 4
ECE 456	Global Nav Satellite Systems	4
ECE 457	Microwave Devices & Circuits	3
ECE 458	Applic of Radio Wave Propag	3
ECE 459	Communications Systems	3
ECE 460	Optical Imaging	4
ECE 461	Digital Communications	3
ECE 462	Logic Synthesis	3
ECE 463	Digital Communications Lab	2
ECE 464	Power Electronics	3
ECE 465	Optical Communications Systems	3
ECE 466	Optical Communications Lab	1
ECE 467	Biophotonics	3
ECE 468	Optical Remote Sensing	3
ECE 469	Power Electronics Laboratory	2
ECE 470	Introduction to Robotics	4
ECE 472	Biomedical Ultrasound Imaging	3
ECE 473	Fund of Engrg Acoustics	3 or 4

ECE 476	Power System Analysis	3
ECE 478	Formal Software Development Methods	3 or 4
ECE 480	Magnetic Resonance Imaging	3 or 4
ECE 481	Nanotechnology	4
ECE 482	Digital IC Design	3
ECE 483	Analog IC Design	3
ECE 485	MEMS Devices & Systems	3
ECE 486	Control Systems	4
ECE 487	Intro Quantum Electr for EEs	3
ECE 488	Compound Semicond & Devices	3
ECE 489	Robot Dynamics and Control	4
ECE 490	Introduction to Optimization	3 or 4
ECE 491	Numerical Analysis	3 or 4
ECE 492	Parallel Progrmg: Sci & Engrg	3 or 4
ECE 493	Advanced Engineering Math	3 or 4
ECE 495	Photonic Device Laboratory	3
ECE 496	Senior Research Project	2
ECE 499	Senior Thesis	2
ECE 298	Special Topics (As approved)	1 to 4
ECE 398	Special Topics in ECE (As approved)	0 to 4
ECE 498	Special Topics in ECE (As approved)	0 to 4
ENG 491	Interdisciplinary Design Proj (CubeSat, Solar Decathlon, Formula SAE, Baja SAE, or by Approval.)	1 to 4
GEOL 107	Physical Geology	4
GEOL 208	History of the Earth System	4
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
GEOL 411	Structural Geol and Tectonics	4
GEOL 417	Geol Field Methods, Western US	6
GEOL 432	Mineralogy and Mineral Optics	4
GEOL 436	Petrology and Petrography	4
GEOL 440	Sedimentology and Stratigraphy	4
GEOL 450	Probing the Earth's Interior	3
GEOL 452	Introduction to Geophysics	4
GEOL 460	Geochemistry	3
IE 310	Deterministic Models in Optimization	3
IE 330	Industrial Quality Control	3
IE 360	Facilities Planning and Design	3
IE 361	Production Planning & Control	3
IE 400	Design & Anlys of Experiments	3 or 4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
IE 411	Optimization of Large Systems	3 or 4
IE 412	OR Models for Mfg Systems	3 or 4
IE 413	Simulation	3 or 4
IE 420	Financial Engineering	3 or 4
IE 430	Economic Found of Quality Syst	3 or 4
IE 431	Design for Six Sigma	3
IB 150	Organismal & Evolutionary Biol	4
IB 202	Physiology	3 or 4
IB 203	Ecology	4
IB 204	Genetics	3 or 4
IB 302	Evolution	4

ID 225	Diant Customatics	4
IB 335 IB 348	Plant Systematics Fish and Wildlife Ecology	4
IB 368	Vertebrate Natural History	4
IB 401	Introduction to Entomology	3 or 4
IB 405	Evolution of Traits and Genomes	
IB 420	Plant Physiology	3
IB 421	Photosynthesis	
IB 426	Env and Evol Physl of Animals	3
IB 427	Insect Physiology	
IB 431	Behavioral Ecology	4
IB 432	Genes and Behavior	3
IB 440	Plants and Global Change	3
IB 443	Evolutionary Ecology	3
IB 444	Insect Ecology	3 or 4
IB 451	Conservation Biology	
IB 452	Ecosystem Ecology	4
IB 453		3
IB 461	Community Ecology	3
IB 462	Ornithology	4
IB 463	Mammalogy	4
IB 464	Ichthyology	
IB 467	Herpetology Dringiples of Systematics	4
IB 468	Principles of Systematics Insect Classification and Evol	4
IB 471		
IB 471	General Mycology Plant Molecular Biology	4
IB 473	Plant Genomics	1
IB 481 IB 482	Vector-borne Diseases	4
IB 483	Insect Pest Management	3
IB 485	Insect Pathology	3
IB 486	Environ Toxicology & Health	3 or 4
LING 300	Pesticide Toxicology Anat & Dhysial Snah Machanian	
LING 406	Anat & Physiol Spch Mechanism	2 07 4
LING 406 LING 407	Introduction to Computational Linguistics	3 or 4
	Logic and Linguistic Analysis	3 or 4 3 or 4
LING 427 MSE 280	Language and the Brain	
	Engineering Materials	3
topics courses can be reviewed in the	Il 300 and 400 level courses except 304, 460, and 461. Exceptions of seminar and special	
MATH 213	Basic Discrete Mathematics	3
MATH 347	Fundamental Mathematics	3
MATH 348	Fundamental Mathematics-ACP	4
MATH 357	Numerical Methods I	3
MATH 402	Non Euclidean Geometry	3 or 4
MATH 403	Euclidean Geometry	3 or 4
MATH 412	Graph Theory	3 or 4
MATH 413	Intro to Combinatorics	3 or 4
MATH 414	Mathematical Logic	3 or 4
MATH 416	Abstract Linear Algebra	3 or 4
MATH 417	Intro to Abstract Algebra	3 or 4
MATH 418	Intro to Abstract Algebra II	3 or 4
MATH 423	Differential Geometry	3 or 4
MATH 424	Honors Real Analysis	3
		3

MATH 425	Honors Advanced Analysis	3
MATH 427	Honors Abstract Algebra	3
MATH 428	Honors Topics in Mathematics	3
MATH 432	Set Theory and Topology	3 or 4
MATH 442	Intro Partial Diff Equations	3 or 4
MATH 444	Elementary Real Analysis	3 or 4
MATH 446	Applied Complex Variables	3 or 4
MATH 447	Real Variables	3 or 4
MATH 448	Complex Variables	3 or 4
MATH 450	Numerical Analysis	3 or 4
MATH 453	Number Theory	3 or 4
MATH 473	Algorithms	4
MATH 475	Formal Models of Computation	3 or 4
MATH 481	Vector and Tensor Analysis	3 or 4
MATH 482	Linear Programming	3 or 4
MATH 484	Nonlinear Programming	3 or 4
MATH 487	Advanced Engineering Math	3 or 4
MATH 489	Dynamics & Differential Eqns	3 or 4
MCB 150	Molec & Cellular Basis of Life	3 01 4
MCB 250	Molecular Genetics	3
MCB 251	Exp Techniqs in Molecular Biol	2
MCB 252	Cells, Tissues & Development	3
MCB 253	Exp Techniqs in Cellular Biol	2
MCB 300	Microbiology	3
MCB 301	Experimental Microbiology	3
MCB 314	Introduction to Neurobiology	3
MCB 316	Genetics and Disease	4
MCB 354	Biochem & Phys Basis of Life	3
MCB 400	Cancer Cell Biology	3
MCB 401	Cellular Physiology	3
MCB 402	Sys & Integrative Physiology	3
MCB 403	Cell & Membrane Physiology Lab	1 or 2
MCB 404	Sys & Integrative Physiol Lab	1 to 2
MCB 406	Gene Expression & Regulation	3
MCB 408	Immunology	3
MCB 410	Developmental Biology, Stem Cells and Regenerative Medicine	3
MCB 413	Endocrinology	3
MCB 419	Brain, Behavior & Info Process	3
MCB 421	Microbial Genetics	3
MCB 424	Microbial Biochemistry	3
MCB 426	Bacterial Pathogenesis	3
MCB 430	Molecular Microbiology	3
MCB 431	Microbial Physiology	3
MCB 433	Virology & Viral Pathogenesis	3
MCB 435	Evolution of Infectious Disease	3
MCB 446	Physical Biochemistry	3
MCB 480	Eukaryotic Cell Signaling	3
ME 200	Thermodynamics	3
ME 310	Fundamentals of Fluid Dynamics	4
ME 320	Heat Transfer	4
ME 330	Engineering Materials	4
ME 340	Dynamics of Mechanical Systems	3.5
	,	0.0

ME 370	Mechanical Design I	3
ME 371	Mechanical Design II	3
ME 400	Energy Conversion Systems	3 or 4
ME 401	Refrigeration and Cryogenics	3 or 4
ME 402	Design of Thermal Systems	3 or 4
ME 403	Internal Combustion Engines	3 or 4
ME 404	Intermediate Thermodynamics	4
ME 410	Intermediate Gas Dynamics	3 or 4
ME 411	Viscous Flow & Heat Transfer	4
ME 412	Numerical Thermo-Fluid Mechs	2 to 4
ME 420	Intermediate Heat Transfer	4
ME 430	Failure of Engrg Materials	3 or 4
ME 431	Mechanical Component Failure	3 or 4
ME 440	Kinem & Dynamics of Mech Syst	3 or 4
ME 445	Introduction to Robotics	4
ME 450	Course ME 450 Not Found	
ME 451	Computer-Aided Mfg Systems	3 or 4
ME 452	Num Control of Mfg Processes	3 or 4
ME 460	Industrial Control Systems	4
ME 461	Computer Cntrl of Mech Systems	3 or 4
ME 471	Finite Element Analysis	3 or 4
ME 472	Introduction to Tribology	3 or 4
ME 485	MEMS Devices & Systems	3
ME 487	MEMS-NEMS Theory & Fabrication	4
MUS 407	Elect Music Techniques I	3
MUS 409	Elec Music Techniques II	2
NEUR 453	Cog Neuroscience of Vision	3 or 4
NPRE 201	Energy Systems	2 or 3
NPRE 247	Modeling Nuclear Energy System	3
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 412	Nuclear Power Econ & Fuel Mgmt	3 or 4
NPRE 421	Plasma and Fusion Science	3
NPRE 423	Plasma Laboratory	2
NPRE 429	Plasma Engineering	3
NPRE 431	Materials in Nuclear Engrg	3
NPRE 432	Nuclear Engrg Materials Lab	2
NPRE 435	Radiological Imaging	3
NPRE 441	Radiation Protection	4
NPRE 442	Radioactive Waste Management	3
NPRE 444	Nuclear Analytical Methods Lab	2 or 3
NPRE 446	Radiation Interact w/Matter I	3
NPRE 447	Radiation Interact w/Matter II	3
NPRE 448	Nuclear Syst Engrg & Design	4
NPRE 451	NPRE Laboratory	3
NPRE 455	Neutron Diffusion & Transport	4
NPRE 457	Safety Anlys Nucl Reactor Syst	3 or 4
NPRE 458	Design in NPRE	4
NPRE 470	Fuel Cells & Hydrogen Sources	3
NPRE 475	Wind Power Systems	3 or 4
PHYS 225	Relativity & Math Applications	2
PHYS 325	Classical Mechanics I	3
PHYS 326	Classical Mechanics II	3

PHYS 401	Classical Physics Lab	3
PHYS 402	Light	3 or 4
PHYS 403	Modern Experimental Physics	4 or 5
PHYS 406	Acoustical Physics of Music	4
PHYS 419	Space, Time, and Matter-ACP	3 or 4
PHYS 420	Space, Time, and Matter Space, Time, and Matter	2
PHYS 427	Thermal & Statistical Physics	4
PHYS 460	Condensed Matter Physics	4
PHYS 466	Atomic Scale Simulations	3 or 4
PHYS 470	Subatomic Physics	4
PHYS 485	Atomic Phys & Quantum Theory	3
PHYS 486	Quantum Physics I	4
PHYS 487	Quantum Physics II	4
PSYC 204	Intro to Brain and Cognition	
SHS 200	General Phonetics	3
SHS 240		3
SHS 300	Intro Sound & Hearing Science	
SHS 301	Anat & Physiol Spch Mechanism	4
SHS 320	General Speech Science Development of Spoken Language	4
	· · · · · · · · · · · · · · · · · · ·	
SHS 450	Intro Audiol & Hear Disorders	4
SHS 470	Neural Bases Spch Lang	2 - 1 4
STAT 420	Methods of Applied Statistics	3 or 4
STAT 424	Analysis of Variance	3 or 4
STAT 425	Statistical Modeling I	3 or 4
STAT 428	Statistical Computing	3 or 4
STAT 449	Time Series Analysis	3 or 4
STAT 440	Statistical Data Management	3 or 4
SE 411	Reliability Engineering	3 or 4
SE 420	Digital Control Systems	4
SE 423	Mechatronics	3
SE 424	State Space Design for Control	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 324	Behavior of Materials	4
TAM 335	Introductory Fluid Mechanics	4
TAM 412	Intermediate Dynamics	4
TAM 435	Intermediate Fluid Mechanics	4
TAM 445	Continuum Mechanics	4
TAM 451	Intermediate Solid Mechanics	4
ECE Courses to include:		
-	list of Advanced Core ECE electives:	
	owing list of Advanced Core ECE electives	4
ECE 391	Computer Systems Engineering	4
or CS 225	Data Structures	2
ECE 310	Digital Signal Processing	3
ECE 330	Power Ckts & Electromechanics	3
ECE 342	Electronic Circuits	3
ECE 350	Fields and Waves II	3
	below. At least one must be hardware labs	
Hardware Lahs:	owing list of ECE labs. At least one must be a Hardware Lab.	
Daluwale Lans.		

ECE 343	Electronic Circuits Laboratory	1
ECE 391	Computer Systems Engineering	4
ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 402	Electronic Music Synthesis	3
ECE 415	Biomedical Instrumentation Lab	2
ECE 420	Embedded DSP Laboratory	2
ECE 431	Electric Machinery	4
CS 436	Computer Networking Laboratory	3 or 4
ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 443	LEDs and Solar Cells	4
ECE 444	IC Device Theory & Fabrication	4
ECE 446	Principles of Experimental Research in Electrical Engineering	4
ECE 447	Active Microwave Ckt Design	3
ECE 451	Adv Microwave Measurements	3
ECE 453	Wireless Communication Systems	4
ECE 456	Global Nav Satellite Systems	4
ECE 460	Optical Imaging	4
ECE 463	Digital Communications Lab	2
ECE 466	Optical Communications Lab	1
ECE 468	Optical Remote Sensing	3
ECE 469	Power Electronics Laboratory	2
ECE 470	Introduction to Robotics	4
ECE 481	Nanotechnology	4
ECE 486	Control Systems	4
ECE 489	Robot Dynamics and Control	4
ECE 495	Photonic Device Laboratory	3
Software Labs:		
ECE 311	Digital Signal Processing Lab	1
ECE 314	Probability in Engineering Lab	1
ECE 365	Data Science and Engineering	3
ECE 411	Computer Organization & Design	4
ECE 484	Principles of Safe Autonomy	4
Flectives		

Electives

Code	Title		Hours
5	f Engineering Liberal Education course list, c navioral Sciences or Humanities and the Arts	or additional courses from the campus General Education	6
	nal unrestricted course work, subject to certa earned toward the degree. ⁸	ain exceptions as noted by the College, so that there are at	12
Total Hours of Curricul	um to Graduate		128

- External transfer students takeENG 300 instead.
- 2 MATH 220may be substituted, with four of the five credit hours applying toward the degree. MATH 220is appropriate for students with no background
- Freshmen takeECE 110for 3 credit hours. Lab-only version taken by transfer students (with special permission) is 1 credit hour.
- 4 STAT 410may be substituted.
- ECE 496ANDECE 499may be substituted.
- Advanced Composition may be satisfied by completing ECE 445, or a course in either the general education or free elective categories which has the Advanced Composition designation.

7	The Grainger College of Engineeringapproved liberal education course list (https://go.grainger.illinois.edu/LiberalEducation/). Note that these credit hours could carry the required cultural studies designation required for campus general education requirements. The Grainger College of Engineeringrestrictions to free electives (https://go.grainger.illinois.edu/FreeElectives/).
Corresp	oonding Degree
BS Bac	helor of Science
Progr	am Features
Acaden	nic Level
Underg	raduate
Does th	is major have transcripted concentrations?
What is	the typical time to completion of this program?
4 years	
What a	re the minimum Total Credit Hours required for this program?
CIP Cod	de de la companya de
141001	- Electrical and Electronics Engineering.
Is This No	a Teacher Certification Program?
Will spe	ecialized accreditation be sought for this program?
No	
Delive	ery Method
This pro	ogram is available:
On Can	npus - Students are required to be on campus, they may take some online courses.

Enrollment Describe how this revision will impact enrollment and degrees awarded. No impact **Estimated Annual Number of Degrees Awarded** What is the matriculation term for this program? Fall **Budget** Are there budgetary implications for this revision? No Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available? No **Financial Resources** How does the unit intend to financially support this proposal? No financial impact is expected. Will the unit need to seek campus or other external resources? No Are you seeking a change in the tuition rate or differential for this program?

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

No impact.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

No impact.

EP Documentation

EP Control Number

EP.22.030

This proposal requires HLC inquiry

No

DMI Documentation

Banner/Codebook Name

BS:Electrical Engineerng -UIUC	

Program Code:

10KP0115BS

Degree Code

BS

Major Code

0115

Program Reviewer Comments

Deb Forgacs (dforgacs) (Wed, 15 Sep 2021 14:51:53 GMT):Rollback: requested.

Deb Forgacs (dforgacs) (Mon, 27 Sep 2021 13:57:35 GMT):Re-entered the proposal type, the corresponding program and the CIP code due to system bug 09/27/2021

Kathy Martensen (kmartens) (Wed, 06 Oct 2021 16:44:13 GMT): Administrative approval: Doesn't change total hours required, doesn't restrict students' options.

Key: 116



Current Program of Study

Orientation and Professional		
Development		
ENG 100	Engineering Orientation ¹	0
Total Hours		0

Foundational Mathematics		
and Science		
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
MATH 221	Calculus I 2	4
MATH 231	Calculus II	3
	Linear Algebra with	
	Computational Applications	3
MATH 257	(Linear Algebra)	
	Abstract Linear Algebra	
or MATH 416		
MATH 241	Calculus III	4
MATH 285	Intro Differential Equations	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PH13 212		
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		33

Electrical Engineering		
Technical Core		
ECE 110	Introduction to Electronics 3	3
ECE 120	Introduction to Computing	4
	Computer Systems &	4
ECE 220	Programming	4
ECE 210	Analog Signal Processing	4
FCF 313	Probability with Engrg Applic 4	3
ECE 313 ECF 329	Fields and Waves I	3
ECE 340	Semiconductor Electronics	3
ECE 385	Digital Systems Laboratory	3
ECE 445	Senior Design Project Lab 5,6	4
Total Hours		31

Technical Electives		
30 hours, to include:		
Non-ECE courses from list below	r:	6
AF 202	Aerospace Flight Mechanics	3
AL 202		-
AE 302	Aerospace Flight Mechanics II	3
AE 311	Incompressible Flow	3
AE 312	Compressible Flow	3
	Mechs of Aerospace Structures	3
AE 321	Mechs of Aerospace Structures	3
	Aerospace Dynamical Systems	3
AE 352		-
AE 353	Aerospace Control Systems	3
AE 402	Orbital Mechanics	3 or 4
AE 403	Spacecraft Attitude Control	3 or 4
AE 410	Computational Aerodynamics	3 or 4
AF 412	Viscous Flow & Heat Transfer	4
AE 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AE 427	Course AE 427 Not Found	
AE 428	Mechanics of Composites	3
AE 433	Aerospace Propulsion	3 or 4
AE 434	Rocket Propulsion	3 or 4
AE 435	Electric Propulsion	3 or 4
AE 451	Aeroelasticity	3 or 4
	Aerodynamics & Propulsion Lab	2
AE 460	•	

New Program of Study

Orientation and Professional		
Development		
ENG 100	Engineering Orientation 1	0
Total Hours		0

Foundational Mathema	atics and	
Science		
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
MATH 221	Calculus I ²	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 257	Linear Algebra with Computational Applications	3
or MATH 416	Abstract Linear Algebra	
MATH 285	Intro to Differential Eq	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
PHYS 214 Total Hours	Univ Physics: Quantum Physics	2

Electrical Engineering	Technical	
Core		
ECE 110	Introduction to Electronics ³	3
ECE 120	Introduction to Computing	4
	Computer Systems &	4
ECE 220	Programming	4
ECE 210	Analog Signal Processing	4
	Probability with Engrg Applic 4	3
ECE 313	Probability With Englg Applic	,
ECE 329	Fields and Waves I	3
ECE 340	Semiconductor Electronics	3
ECE 385	Digital Systems Laboratory	3
ECE 445	Senior Design Project Lab 5,6	4
Total Hours		31

Technical Electives		
From the Departmentally Approve	ed List of Technical Electives, to	
include:		30
at least 6 hours of non-ECE electi	ves	
at least 20 hours of ECE electives		
at least 3 Advanced Core Electives	5	
at least 3 ECE Labs, where at least		
AE 202	Aerospace Flight Mechanics	3
AE 302	Aerospace Flight Mechanics II	3
AE 311	Incompressible Flow	3
AE 312	Compressible Flow	3
AF 224	Marks of Assessed Street	2
AE 321	Mechs of Aerospace Structures	3
AF 352	Aerospace Dynamical Systems	3
AE 353	Aerospace Control Systems	3
AF 402	Orbital Mechanics	3 or 4
AF 403	Spacecraft Attitude Control	3 or 4
7.2.103	Spaces are recitate control	5 0
AE 410	Computational Aerodynamics	3 or 4
AE 412	Viscous Flow & Heat Transfer	4
AE 416	Applied Aerodynamics	3 or 4
AE 419	Aircraft Flight Mechanics	3 or 4
AE 420	Finite Element Analysis	3 or 4
AE 428	Mechanics of Composites	3
AE 433	Aerospace Propulsion	3 or 4
AE 434	Rocket Propulsion	3 or 4
AE 435	Electric Propulsion	3 or 4
AE 451	Aeroelasticity	3 or 4
	-	
AE 460	Aerodynamics & Propulsion Lab	2

			Ag and Bio Eng All 300 and 400		
			level courses except ABE 440.		
			Except seminars and special topics courses, which may be		
Ag and Bio Eng All 300 and	d 400 level courses except ABE 440. Ex	С	reviewed in the Advising Office		
ASTR 210	Introduction to Astrophysics	3	ASTR 210	Introduction to Astrophysics	3
ASTR 310	Computing in Astronomy	3	ASTR 310	Computing in Astronomy	3
ASTR 330	Extraterrestrial Life The Big Bang, Black Holes, and	3	ASTR 330	Extraterrestrial Life The Big Bang, Black Holes, and the	3
ASTR 350	the End of the Universe	3	ASTR 350	End of the Universe	3
ASTR 404	Stellar Astrophysics	3	ASTR 404	Stellar Astrophysics	3
ASTR 405	Planetary Systems	3	ASTR 405	Planetary Systems	3
ASTR 406	Galaxies and the Universe	3	ASTR 406	Galaxies and the Universe	3
ASTR 414 ASTR 450	Astronomical Techniques Astrochemistry	4	ASTR 414 ASTR 450	Astronomical Techniques Astrochemistry	4
A31K 430	·		A31K430	Astrochemistry	4
ATMS 201	General Physical Meteorology	3	ATMS 201	General Physical Meteorology	3
ATMS 301	Atmospheric Thermodynamics	3	ATMS 301	Atmospheric Thermodynamics	3
ATMS 302	Atmospheric Dynamics I	3	ATMS 302	Atmospheric Dynamics I	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4	ATMS 303	Synoptic-Dynamic Wea Analysis	4
ATMS 304	Radiative Transfer-Remote Sens	3	ATMS 304	Radiative Transfer-Remote Sens	3
ATMS 305	Computing and Data Analysis	3	ATMS 305	Computing and Data Analysis	3
ATMS 404	Risk Analysis in Earth Science	3 or 4	ATMS 404	Risk Analysis in Earth Science	3 or 4
ATMS 405	Boundary Layer Processes	4	ATMS 405	Boundary Layer Processes	4
ATMS 406	Tropical Meteorology	4	ATMS 406	Tropical Meteorology	4
ATMS 410	Radar Remote Sensing	4	ATMS 410	Radar Remote Sensing	4
ATMS 411 ATMS 420	Satellite Remote Sensing Atmospheric Chemistry	4	ATMS 411 ATMS 420	Satellite Remote Sensing Atmospheric Chemistry	4
ATMS 421	Earth Systems Modeling	4	ATMS 421	Earth Systems Modeling	4
ATMS 425	Air Quality Modeling	4			•
ATMS 447	Climate Change Assessment	3	ATMS 447	Climate Change Assessment	3
ATMS 449	Biogeochemical Cycles	4	ATMS 449	Biogeochemical Cycles	4
BIOC 406	Gene Expression & Regulation	3	BIOC 406	Gene Expression & Regulation	3
BIOC 440	Physical Chemistry Principles	4	BIOC 440	Physical Chemistry Principles	4
BIOC 446	Physical Biochemistry	3	BIOC 446	Physical Biochemistry	3
BIOC 455	Technqs Biochem & Biotech	4	BIOC 455	Technqs Biochem & Biotech	4
BIOE 201	Conservation Principles Bioeng	3	BIOE 201	Conservation Principles Bioeng	3
BIOE 202	Cell & Tissue Engineering Lab	2	BIOE 202	Cell & Tissue Engineering Lab	2
BIOE 302	Modeling Human Physiology	3	BIOE 302	Modeling Human Physiology	3
BIOE 414	Biomedical Instrumentation	3	BIOE 414	Biomedical Instrumentation	3
		-			
	Biomedical Instrumentation Lab	2			_
BIOE 415		2	BIOE 415	Biomedical Instrumentation Lab	2
BIOE 415 BIOE 461	Cellular Biomechanics	2	BIOE 461	Cellular Biomechanics	4
BIOE 415 BIOE 461 BIOE 467	Cellular Biomechanics Biophotonics	2 4 3	BIOE 461 BIOE 467	Cellular Biomechanics Biophotonics	4 3
BIOE 415 BIOE 461	Cellular Biomechanics	2	BIOE 461	Cellular Biomechanics	4
BIOE 415 BIOE 461 BIOE 467 BIOE 476	Cellular Biomechanics Biophotonics Tissue Engineering	2 4 3 3	BIOE 461 BIOE 467 BIOE 476	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging	4 3 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476	Cellular Biomechanics Biophotonics Tissue Engineering	2 4 3 3	BIOE 461 BIOE 467 BIOE 476	Cellular Biomechanics Biophotonics Tissue Engineering	4 3 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging	2 4 3 3	BIOE 481 BIOE 476 BIOE 480 BIOE 480	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging wel courses except seminars and	2 4 3 3	BIOE 461 BIOE 467 BIOE 476 BIOE 480	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging	2 4 3 3	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging wel courses except seminars and	2 4 3 3	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging wel courses except seminars and h may be reviewed in the Advising	2 4 3 3 3 3 or 4	BIOE 461 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office.	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE	2 4 3 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE	4 3 3 3 or 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics	2 4 3 3 3 or 4	BIOE 461 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office.	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging	4 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE	2 4 3 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE	4 3 3 3 or 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which Office. CHBE 221 CHBE 321	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics	2 4 3 3 3 or 4	BIOE 461 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics	4 3 3 3 or 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations	4 3 3 3 or 4 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering	4 3 3 3 or 4 4 4 4 4 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory	4 3 3 3 or 4 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering	4 3 3 3 or 4 4 4 4 4 3 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 424	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory	4 3 3 3 or 4 4 4 4 4 3 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 440 CHBE 440 CHBE 440 CHBE 451	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 424 CHBE 424 CHBE 430 CHBE 430	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design	4 3 3 3 or 4 4 4 4 4 4 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 430 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 451	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 424 CHBE 424 CHBE 430 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 451 CHBE 452	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis	4 3 3 3 or 4 4 4 4 4 4 4 3 3 3 3 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 440 CHBE 440 CHBE 440 CHBE 451	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging vel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 485 BIOPIS All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 424 CHBE 430 CHBE 431 CHBE 440 CHBE 440 CHBE 451	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena	4 3 3 3 or 4 4 4 4 4 4 4 3 3 4 4 4 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 452 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis	2 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 2 or 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 430 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 451	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering	2 4 3 3 3 or 4 3 4 4 4 4 3 3 3 2 or 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 430 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 453 CHBE 453 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering	4 3 3 3 or 4 4 4 4 4 4 4 3 3 3 3 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 430 CHBE 430 CHBE 430 CHBE 451 CHBE 452 CHBE 453 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and In may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering	2 4 3 3 3 or 4 3 4 4 4 4 3 3 3 2 or 3 3	BIOE 461 BIOE 467 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering	4 3 3 3 or 4 4 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 3 3 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 431 CHBE 452 CHBE 453 CHBE 453 CHBE 453 CHBE 453 CHBE 453	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering	2 4 3 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 430 CHBE 431 CHBE 430 CHBE 451 CHBE 450 CHBE 451 CHBE 455 CHBE 453 CHBE 456 CHBE 457	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing	4 3 3 3 or 4 4 4 4 4 4 4 3 3 4 4 4 3 3 3 2 or 3
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 424 CHBE 430 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 452 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and In may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng	2 4 3 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 430 CHBE 451 CHBE 452 CHBE 453 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng	4 3 3 3 or 4 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 453 CHBE 453 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 472 CHBE 473	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering	2 4 3 3 3 or 4 3 4 4 4 3 3 3 2 or 3 3 3 3 or 4 3 or 4 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 420 CHBE 430 CHBE 451 CHBE 450 CHBE 451 CHBE 451 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 477	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering	4 3 3 3 or 4 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 452 CHBE 453 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 471 CHBE 473 CHBE 473 CHBE 473 CHBE 474	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Magnetic Resonance Imaging Evel courses except seminars and hamy be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering	2 4 3 3 3 or 4 3 4 4 4 4 3 3 4 4 4 3 3 3 2 or 3 3 3 3 or 4 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 455 CHBE 456 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 473 CHBE 473	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering	4 3 3 3 or 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 430 CHBE 430 CHBE 451 CHBE 455 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 473 CHBE 474 CHBE 474 CHBE 174	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Magnetic Resonance Imaging Evel courses except seminars and harmay be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 480 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 457 CHBE 457 CHBE 457 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 474 CHEM 104	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 452 CHBE 453 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 471 CHBE 473 CHBE 473 CHBE 473 CHBE 474	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Magnetic Resonance Imaging Evel courses except seminars and hamy be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering	2 4 3 3 3 or 4 3 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4 3 3 3 or 4	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 455 CHBE 456 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 473 CHBE 473	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering	4 3 3 3 or 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 430 CHBE 430 CHBE 451 CHBE 455 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 473 CHBE 474 CHBE 474 CHBE 174	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Magnetic Resonance Imaging Evel courses except seminars and harmay be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 485 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 456 CHBE 457 CHBE 457 CHBE 457 CHBE 477 CHBE 478	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 430 CHBE 430 CHBE 431 CHBE 455 CHBE 457 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 473 CHBE 474 CHEM 104 CHEM 105	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Magnetic Resonance Imaging Evel courses except seminars and harmay be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 480 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 457 CHBE 457 CHBE 457 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 474 CHEM 104	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 321 CHBE 422 CHBE 422 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 452 CHBE 453 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 474 CHEM 104 CHEM 105 Chemistry (CHEM): All 200, and 499. Exceptions also ince	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering General Chemistry II General Chemistry Lab II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 423 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 452 CHBE 457 CHBE 457 CHBE 457 CHBE 477 CHBE 477 CHBE 477 CHBE 477 CHBE 472 CHBE 474 CHEM 104 CHEM 105 Chemistry (CHEM): All 200, 300	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 453 CHBE 457 CHBE 453 CHBE 453 CHBE 453 CHBE 457 CHBE 473 CHBE 471 CHBE 472 CHBE 471 CHBE 472 CHBE 473 CHBE 470 CHBE 471 CHBE 472 CHBE 473 CHBE 470 CHBE 471 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 474 CHEM 104 CHEM 105	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering General Chemistry II General Chemistry Lab II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 423 CHBE 430 CHBE 431 CHBE 440 CHBE 451 CHBE 455 CHBE 457 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 473 CHBE 471 CHBE 472 CHBE 473 CHBE 474 CHEM 104 CHEM 105 Chemistry (CHEM): All 200, 300 and 400 level except 397, 497, and 499. Exceptions also include seminars and special topics,	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4
BIOE 415 BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 480 Biophysics (BIOP): All 400 le special topics courses, which office. CHBE 221 CHBE 321 CHBE 321 CHBE 422 CHBE 422 CHBE 430 CHBE 431 CHBE 451 CHBE 451 CHBE 452 CHBE 453 CHBE 457 CHBE 457 CHBE 471 CHBE 472 CHBE 473 CHBE 474 CHEM 104 CHEM 105 Chemistry (CHEM): All 200, and 499. Exceptions also ince	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Wel courses except seminars and h may be reviewed in the Advising Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Polymer Science & Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering General Chemistry II General Chemistry Lab II	2 4 3 3 3 3 or 4 4 4 4 3 3 4 4 4 3 3 3 3 2 or 3 3 3 3 or 4 3	BIOE 461 BIOE 467 BIOE 476 BIOE 476 BIOE 488 BIOE 485 Biophysics (BIOP): All 400 level courses except seminars and special topics courses, which may be reviewed in the Advising Office. CHBE 221 CHBE 321 CHBE 421 CHBE 422 CHBE 422 CHBE 424 CHBE 430 CHBE 431 CHBE 451 CHBE 455 CHBE 457 CHBE 457 CHBE 457 CHBE 477 CHBE 478 CHBE 479 CHBE 479 CHBE 479 CHBE 479 CHBE 479 CHBE 471 CHBE 479 CHBE 479 CHBE 471 CHBE 479 CHBE 479	Cellular Biomechanics Biophotonics Tissue Engineering Magnetic Resonance Imaging Computational Mathematics for Machine Learning and Imaging Principles of CHE Thermodynamics Momentum and Heat Transfer Mass Transfer Operations Chemical Reaction Engineering Unit Operations Laboratory Process Design Process Control and Dynamics Transport Phenomena Chemical Kinetics & Catalysis Electrochemical Engineering Microelectronics Processing Biochemical Engineering Techniques in Biomolecular Eng Biomolecular Engineering Metabolic Engineering Metabolic Engineering Metabolic Engineering General Chemistry II	4 3 3 3 or 4 4 4 4 4 4 3 3 4 4 4 4 3 3 3 2 or 3 3 3 3 or 4

CEE 310	Transportation Engineering	3	CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3	CEE 330	Environmental Engineering	3
CEE 408	Railroad Transportation Engrg	3 or 4	CEE 408	Railroad Transportation Engrg	3 or 4
CEE 410	Railway Signaling & Control	3 or 4	CEE 410	Railway Signaling & Control	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4	CEE 416	Traffic Capacity Analysis	3 or 4
CEE 430	Ecological Quality Engineering	2	CEE 430	Ecological Quality Engineering	2
CEE 447	Atmospheric Chemistry	4	CEE 447	Atmospheric Chemistry	4
CEE 491	Decision and Risk Analysis	3 or 4	CEE 491	Decision and Risk Analysis	3 or 4
CPSC 265	Genetic Engineering Lab	3	CPSC 265	Genetic Engineering Lab	3
CS 101	Intro Computing: Engrg & Sci (By	3	CS 101	Intro Computing: Engrg & Sci (By	3
CS 101 CS 173	Approval) Discrete Structures	3	CS 101 CS 173	Approval) Discrete Structures	3
CS 225	Data Structures	4	CS 225	Data Structures	4
CS 242	Programming Studio	3	CS 242	Programming Studio	3
CS 357	Numerical Methods I	3	CS 357	Numerical Methods I	3
CS 410 CS 411	Text Information Systems Database Systems	3 or 4 3 or 4	CS 410 CS 411	Text Information Systems Database Systems	3 or 4 3 or 4
CS 412	Introduction to Data Mining	3 or 4	CS 412	Introduction to Data Mining	3 or 4
CS 413	Intro to Combinatorics	3 or 4	CS 413	Intro to Combinatorics	3 or 4
CS 414	Multimedia Systems	3 or 4	CS 414	Multimedia Systems	3 or 4
Į			CS 416	Data Visualization	3 or 4
CS 418	Interactive Computer Graphics	3 or 4	CS 418	Interactive Computer Graphics	3 or 4
CS 419	Production Computer Graphics	3 or 4	CS 419	Production Computer Graphics	3 or 4
CS 420	Parallel Progrmg: Sci & Engrg	3 or 4	CS 420	Parallel Progrmg: Sci & Engrg	3 or 4
	Programming Languages &	3 or 4		Programming Languages &	
CS 421	Compilers	5 01 4	CS 421	Compilers	3 or 4
CS 422	Programming Language Design	3 or 4	CS 422	Programming Language Design	3 or 4
CS 422 CS 423	Operating Systems Design	3 or 4	CS 422 CS 423	Programming Language Design Operating Systems Design	3 or 4 3 or 4
CS 424	Real-Time Systems	3 or 4	CS 424	Real-Time Systems	3 or 4
CS 425	Distributed Systems	3 or 4	CS 425	Distributed Systems	3 or 4
CS 426	Compiler Construction	3 or 4	CS 426	Compiler Construction	3 or 4
CS 427 CS 428	Software Engineering I Software Engineering II	3 or 4 3 or 4	CS 427 CS 428	Software Engineering I Software Engineering II	3 or 4 3 or 4
CS 429	Software Engineering II, ACP	3	CS 429	Software Engineering II, ACP	3 01 4
CS 431	Embedded Systems	3 or 4	CS 431	Embedded Systems	3 or 4
	Computer System Organization	3 or 4			
CS 433			CS 433	Computer System Organization	3 or 4
l	Computer Networking		CS 435	Cloud Networking	3 or 4
CS 436	Laboratory	3 or 4	CS 436	Computer Networking Laboratory	3 or 4
CS 438	Communication Networks	3 or 4	CS 438	Communication Networks	3 or 4
CC 420	MC - L M - L L -				2
CS 439	Wireless Networks	3 or 4	CS 439	Wireless Networks	3 or 4
CS 449 CS 440	Artificial Intelligence	3 or 4 3 or 4	CS 440	Artificial Intelligence	3 or 4
CS 440	Artificial Intelligence	3 or 4	CS 440 CS 441	Artificial Intelligence Applied Machine Learning	3 or 4
			CS 440	Artificial Intelligence	3 or 4
CS 440 CS 445	Artificial Intelligence Computational Photography	3 or 4 3 or 4	CS 440 CS 441 CS 445	Artificial Intelligence Applied Machine Learning Computational Photography	3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 466 CS 467	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 467 CS 473 CS 475	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 465 CS 467 CS 473	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 467 CS 473	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification	3 or 4 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 4 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development	3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 467 CS 473 CS 475	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic	3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic	3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 467 CS 475 CS 476 CS 477	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications	3 or 4 4 3 or 4 3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming	3 or 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477 CS 476 CS 477	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming	3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477 CS 477 CS 481 CS 484 CS 398	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved)	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 477 CS 477 CS 478	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved)	3 or 4 1 to 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 1 to 4	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477 CS 476 CS 477	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming	3 or 4 4 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 475 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Special Topics (As Approved)	3 or 4 3 or 4 4 3 or 4 3 or 4 1 to 4	CS 440 CS 441 CS 445 CS 446 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 467 CS 477 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Special Topics (As Approved)	3 or 4 4 3 or 4 3 or 4 4 3 or 4 3 or 4 3 or 4 4 3 or 4 4 3 or 4 1 or 4 1 to 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study	3 or 4 4 3 or 4 4 3 or 4 1 to 4 1 to 4 1	CS 440 CS 441 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study	3 or 4 4 3 or 4 1 or 4 3 or 4 1 to 4 1 to 4 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices	3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4 1 to 4	CS 440 CS 441 CS 445 CS 446 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices	3 or 4 1 to 4 1 to 4 1 3 or 4
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 3004	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 4 1 3 3	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 476 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions	3 or 4 4 3 or 4 1 or 4 3 or 7 4 3 or 8 4 5 or 8 6 o
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 307 ECE 310 ECE 311	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing	3 or 4 3 or 4 4 3 or 4 1 to 4 1 to 4 1 1 3 3 3	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 310 ECE 311	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing	3 or 4 1 or 4 3 or 3 3 or 4 3 or 3 3 or 4 3 or 4 3 or 4 3 or 4 3 or 3 3 or 3 3
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 307 ECE 310	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing	3 or 4 4 3 or 4 4 3 or 4 3 or 4 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 3 3 3 1	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 467 CS 473 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 307 ECE 310	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab	3 or 4 1 or 4 3 or 6 3 or 7 4 or 8 6
CS 440 CS 445 CS 446 CS 447 CS 450 CS 461 CS 463 CS 465 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 3004 ECE 311 ECE 311	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab	3 or 4 4 3 or 4 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 8 1 to 1 1 to 1	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 310 ECE 311	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab	3 or 4 1 to 6 1 to 7 1 to 8 1 to 8 1 to 9 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304 ECE 307 ECE 311 ECE 314 ECE 329 ECE 330	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 3 or 9 1 to 9 3 or 9 1 to 9 3 or 9 1 to 9 3 or 9 4 or 9 6 or 9 6 or 9 7 o	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304 ECE 311 ECE 314	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab	3 or 4 4 3 or 4 1 or 4 3 or 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 8 1 to 9
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 473 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 311 ECE 314 ECE 329 ECE 330 ECE 333	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics Green Electric Energy	3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 3 3 3 1 1 3 3 3 3 1	CS 440 CS 441 CS 445 CS 446 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 310 ECE 311	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab	3 or 4 1 to 6 1 to 7 1 to 8 1 to 8 1 to 9 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 467 CS 473 CS 475 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 310 ECE 311 ECE 314 ECE 329 ECE 330 ECE 330 ECE 340	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics Green Electric Energy Semiconductor Electronics	3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 5 1 to 6 1 to 7 1 to 8 3 or 8 3 or 9 3 or 9 3 or 9 4 or 9 5 or 9 6 or 9 7 or	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 481 CS 477 CS 481 CS 498 ECE 297 ECE 300 ECE 311 ECE 314 ECE 330 ECE 333	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy	3 or 4 1 to 3 3 dr 4 1 to 5 1 to 6 1 to 7 1 to 8 1 to 8 1 to 9 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 473 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 311 ECE 314 ECE 329 ECE 330 ECE 333	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics Green Electric Energy	3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 3 3 3 1 1 3 3 3 3 1	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304 ECE 311 ECE 314	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab	3 or 4 4 3 or 4 1 or 4 1 or 4 1 to 5 1 to 6 1 to 7 1 to 8 1 to 7 1 to 8 1 to 9
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 311 ECE 314 ECE 329 ECE 330 ECE 333 ECE 340 ECE 342	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics Green Electric Energy Semiconductor Electronics Electronic Circuits	3 or 4 4 3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 3 or 8 3 or 9 4 or 9 5 or 9 6 or 9 7 7 8 or 9	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 477 CS 477 CS 477 CS 478 CS 477 CS 481 CS 488 CS 498 ECE 297 ECE 304 ECE 311 ECE 314 ECE 330 ECE 333 ECE 342	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy Electronic Circuits	3 or 4 1 or 4 3 or 4 3 or 4 3 or 5 1 or 6 1 or 7 1 or 8 1 or 8 1 or 9 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 310 ECE 311 ECE 314 ECE 329 ECE 330 ECE 342 ECE 342 ECE 343 ECE 350	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security I User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves I Power Ckts & Electromechanics Green Electric Energy Semiconductor Electronics Electronic Circuits Electronic Circuits Electronic Circuits Laboratory Fields and Waves II	3 or 4 4 3 or 4 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 5 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 1 to 9 1 to	CS 440 CS 441 CS 445 CS 446 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 477 CS 481 CS 498 ECE 297 ECE 304 ECE 310 ECE 311 ECE 314 ECE 330 ECE 342 ECE 343 ECE 350	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy Electronic Circuits Electronic Circuits Electronic Circuits Laboratory Fields and Waves II	3 or 4 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 1 to 8 1 to 9
CS 440 CS 445 CS 446 CS 447 CS 450 CS 461 CS 463 CS 465 CS 465 CS 466 CS 467 CS 473 CS 475 CS 476 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304 ECE 311 ECE 314 ECE 329 ECE 330 ECE 330 ECE 340 ECE 340 ECE 340 ECE 340 ECE 3442 ECE 344	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves II Power Ckts & Electromechanics Green Electric Energy Semiconductor Electronics Electronic Circuits Electronic Circuits Electronic Circuits Electronic Griegering	3 or 4 4 3 or 4 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 1 to 8 1 to 9 1 to	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 477 CS 475 CS 477 CS 481 CS 484 CS 398 ECE 297 ECE 304 ECE 311 ECE 314 ECE 330 ECE 333 ECE 342 ECE 342 ECE 343	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy Electronic Circuits Electronic Circuits Electronic Circuits Electronic Grienering	3 or 4 4 3 or 4 1 to 4 1 to 4 1 to 4 1 3 3 3 3 1 1 3 3 1
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 465 CS 467 CS 473 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 304 ECE 310 ECE 311 ECE 314 ECE 329 ECE 342 ECE 342 ECE 342 ECE 350 ECE 365	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Computer of Engry Semiconductor Electromics Electronic Circuits Electronic Circuits Electronic Circuits Laboratory Fields and Waves II Data Science and Engineering Introduction to Algorithms &	3 or 4 4 3 or 4 4 3 or 4 1 to 4 1 to 4 1 to 4 1 to 5 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 1 to 9 1 to	CS 440 CS 441 CS 445 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 310 ECE 311 ECE 314 ECE 314 ECE 330 ECE 342 ECE 343 ECE 350 ECE 365	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Computation Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy Electronic Circuits Electronic Circuits Electronic Circuits Laboratory Fields and Waves II Data Science and Engineering Introduction to Algorithms &	3 or 4 4 3 or 4 1 to 5 1 to 6 1 to 7 1 to 7 1 to 8 1 to 8 1 to 9
CS 440 CS 445 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 467 CS 473 CS 475 CS 477 CS 477 CS 481 CS 484 CS 398 CS 498 ECE 297 ECE 300 ECE 310 ECE 311 ECE 314 ECE 329 ECE 330 ECE 342 ECE 342 ECE 343 ECE 350	Artificial Intelligence Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Fields and Waves II Power Ckts & Electromechanics Green Electric Energy Semiconductor Electronics Electronic Circuits Electronic Circuits Electronic Circuits Electronic Griegering	3 or 4 4 3 or 4 4 3 or 4 3 or 4 3 or 4 3 or 4 1 to 4 1 to 4 1 to 5 1 to 5 1 to 7 1 to	CS 440 CS 441 CS 445 CS 446 CS 446 CS 447 CS 450 CS 460 CS 461 CS 463 CS 465 CS 466 CS 477 CS 477 CS 477 CS 477 CS 481 CS 498 ECE 297 ECE 304 ECE 310 ECE 311 ECE 314 ECE 330 ECE 342 ECE 343 ECE 350	Artificial Intelligence Applied Machine Learning Computational Photography Machine Learning Natural Language Processing Numerical Analysis Security Laboratory Computer Security I Computer Security II User Interface Design Introduction to Bioinformatics Social Visualization Algorithms Formal Models of Computation Program Verification Formal Software Development Methods Advanced Topics in Stochastic Processes & Applications Parallel Programming Special Topics (As Approved) Individual Study Photonic Devices Techniques for Engrg Decisions Digital Signal Processing Digital Signal Processing Digital Signal Processing Lab Probability in Engineering Lab Power Ckts & Electromechanics Green Electric Energy Electronic Circuits Electronic Circuits Electronic Circuits Electronic Grienering	3 or 4 1 or 4 3

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	Computer Systems Engineering	4		Computer Systems Engineering	4
ECE 391	g		ECE 391		•
505 305	Advanced Digital Projects Lab	2 or 3	505 205	Advanced Digital Projects Lab	2 or 3
ECE 395	Harana Basinat	1 += 4	ECE 395	Hannan Duniant	1 + - 1
ECE 396	Honors Project	1 to 4	ECE 396 ECE 397	Honors Project	1 to 4 0 to 4
ECE 397 ECE 402	Individual Study in ECE Electronic Music Synthesis	0 to 4 3	ECE 402	Individual Study in ECE Electronic Music Synthesis	3
ECE 403	Audio Engineering	3	ECE 402	Audio Engineering	3
I	Addio Engineering	3	ECE 407	Cryptography	3 or 4
•			202 107		
ECE 408	Applied Parallel Programming	4	ECE 408	Applied Parallel Programming	4
	6			6	
ECE 411	Computer Organization & Design	4	ECE 411	Computer Organization & Design	4
ECE 412	Microcomputer Laboratory	3	ECE 412	Microcomputer Laboratory	3
ECE 414	Biomedical Instrumentation	3	ECE 414	Biomedical Instrumentation	3
	Biomedical Instrumentation Lab	2		Biomedical Instrumentation Lab	2
ECE 415			ECE 415		
ECE 416	Biosensors	3	ECE 416	Biosensors	3
ECE 417	Multimedia Signal Processing	4	ECE 417	Multimedia Signal Processing	4
ECE 417 ECE 418	Image & Video Processing	4	ECE 417	Image & Video Processing	4
ECE 419	Security Laboratory	3 or 4	ECE 419	Security Laboratory	3 or 4
ECE 420	Embedded DSP Laboratory	2	ECE 420	Embedded DSP Laboratory	2
ECE 422	Computer Security I	4	ECE 422	Computer Security I	4
ECE 424	Computer Security II	3 or 4	ECE 424	Computer Security II	3 or 4
ECE 425	Intro to VLSI System Design	3	ECE 425	Intro to VLSI System Design	3
ECE 428	Distributed Systems	3 or 4	ECE 428	Distributed Systems	3 or 4
ECE 431	Electric Machinery	4	ECE 431	Electric Machinery	4
ECE 432	Advanced Electric Machinery	3	ECE 432	Advanced Electric Machinery	3
	Computer Networking	3 or 4		Computer Networking Laboratory	3 or 4
ECE 435	Laboratory		ECE 435		
ECE 437	Sensors and Instrumentation	3	ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4	ECE 438	Communication Networks Wireless Networks	3 or 4
ECE 439	Wireless Networks Physcs & Modeling Semicond	3 or 4	ECE 439	Wireless Networks	3 or 4
ECE 441	Dev	3	ECE 441	Physcs & Modeling Semicond Dev	3
1	DCV		ECE 442	Silicon Photonics	3 or 4
ECE 443	LEDs and Solar Cells	4	ECE 443	LEDs and Solar Cells	4
ECE 444	IC Device Theory & Fabrication	4	ECE 444	IC Device Theory & Fabrication	4
ECE 445	Senior Design Project Lab	4			
	Principles of Experimental	4		Principles of Experimental	
ECE 446	Research in Electrical	4	ECE 446	Research in Electrical Engineering	4
ECE 447	Engineering Active Microwave Ckt Design	3	ECE 447	Active Microwave Ckt Design	3
ECE 448	Artificial Intelligence	3 or 4	ECE 448	Artificial Intelligence	3 or 4
	_		202 110	-	_
ECE 451	Adv Microwave Measurements	3	ECE 451	Adv Microwave Measurements	3
ECE 451 ECE 452	_			-	3
	Adv Microwave Measurements	3	ECE 451	Adv Microwave Measurements Electromagnetic Fields	3
ECE 452 ECE 453	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	3 3 4	ECE 451 ECE 452 ECE 453	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems	3
ECE 452 ECE 453 ECE 454	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 3 4 3	ECE 451 ECE 452 ECE 453 ECE 454	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 4 3
ECE 453 ECE 454 ECE 455	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics	3 3 4 3 3 or 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics	3 4 3 3 or 4
ECE 452 ECE 453 ECE 454	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 3 4 3	ECE 451 ECE 452 ECE 453 ECE 454	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas	3 4 3
ECE 453 ECE 454 ECE 455 ECE 456	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics	3 3 4 3 3 or 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics	3 4 3 3 or 4
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits	3 3 4 3 3 3 or 4 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits	3 4 3 3 or 4 4 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag	3 3 4 4 3 3 3 or 4 4 3 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag	3 4 3 3 or 4 4 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits	3 3 4 3 3 3 or 4 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits	3 4 3 3 or 4 4 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems	3 3 3 3 3 or 4 4 3 3 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 457 ECE 458 ECE 459	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems	3 4 3 3 or 4 4 3 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging	3 3 4 3 3 or 4 4 4 3 3 3 4 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging	3 4 3 3 or 4 4 3 3 3 4
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	3 3 4 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications	3 4 3 3 or 4 4 3 3 4 3 3 3 4 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis	3 3 3 or 4 4 3 3 3 4 4 3 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics	3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 2 2 3 3	ECE 451 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 456 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 463	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics	3 4 3 3 or 4 4 3 3 3 4 4 3 3 3 2 2 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems	3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 2 2 3 3 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems	3 3 3 or 4 4 3 3 3 4 4 3 3 3 2 2 3 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 465	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems	3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 2 2 3 3 3 1	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems	3 4 3 3 3 or 4 4 3 3 3 3 4 4 3 3 3 2 2 3 3 3 1
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 462 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics	3 3 4 4 3 3 3 4 4 3 3 3 3 4 4 3 3 3 3 2 2 3 3 3 1 3 3 1 3 3	ECE 451 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 462 ECE 464 ECE 465 ECE 465 ECE 466 ECE 466 ECE 466	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics	3 3 3 or 4 4 3 3 3 4 4 3 3 2 2 3 3 1 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing	3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 3 4 4 3 3 3 3 4 4 3	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 467 ECE 467	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing	3 4 3 3 or 4 4 3 3 3 4 4 3 3 3 2 2 3 3 3 1 1 3 3 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 467 ECE 467 ECE 468 ECE 469	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory	3 3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 2 3 2	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468 ECE 469	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 2 3 2 3 2
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics	3 3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 2 3 4 4 4 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 467 ECE 467	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 3 2 3 3 1 3 3 4 4 4
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 467 ECE 467 ECE 468 ECE 469	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory	3 3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 2 3 2	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468 ECE 469	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 2 3 2 3 2
ECE 452 ECE 453 ECE 454 ECE 455 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 467 ECE 468 ECE 469 ECE 470	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics	3 3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 2 3 4 4 4 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468 ECE 469 ECE 470	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Systems Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 3 2 3 3 1 3 3 4 4 4
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 465 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468 ECE 469 ECE 470	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging Fund of Engrg Acoustics Power System Analysis	3 3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 2 4 3 3 1 3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 4 4 3 3 3 4 4 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 4 4 3 3 3 4 4 3 3 4 4 3 3 4 4 4 3 3 3 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 466 ECE 466 ECE 466 ECE 467 ECE 468 ECE 469 ECE 470	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging Fund of Engrg Acoustics Power System Analysis	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 1 3 3 2 4 3 3 3 3 1 3 3 3 4 3 3 3 3 4 3 3 3 3 4 3 3 3 3
ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 466 ECE 466 ECE 466 ECE 467 ECE 466 ECE 470 ECE 472 ECE 473 ECE 476	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging Fund of Engrg Acoustics Power System Analysis Formal Software Development	3 3 4 3 3 or 4 4 3 3 3 or 4 4 3 3 3 1 3 2 3 3 1 3 3 3 3 3 4 3 3 4 3 3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4 4 4 3 3 3 4	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 464 ECE 468 ECE 466 ECE 467 ECE 468 ECE 470 ECE 472 ECE 473 ECE 476	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging Fund of Engrg Acoustics Power System Analysis Formal Software Development	3 4 3 3 or 4 4 3 3 3 4 3 3 4 3 3 2 3 3 3 3 3 3 3 3
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ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 457 ECE 458 ECE 459 ECE 460 ECE 461 ECE 462 ECE 463 ECE 466 ECE 466 ECE 467 ECE 467 ECE 468 ECE 470 ECE 472 ECE 473 ECE 470 ECE 478 ECE 480 ECE 480 ECE 480 ECE 481 ECE 480 ECE 483 ECE 485 ECE 488 ECE 488 ECE 489 ECE 490 ECE 491 ECE 492 ECE 493	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Systems Optical Communications Lab Biophotonics Optical Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging Fund of Engrg Acoustics Power System Analysis Formal Software Development Methods Magnetic Resonance Imaging Nanotechnology Digital IC Design Analog IC Design MEMS Devices & Systems Control Systems Intro Quantum Electr for EEs Compound Semicond & Devices Robot Dynamics and Control Introduction to Optimization Numerical Analysis Parallel Progrmg: Sci & Engrg Advanced Engineering Math	3 3 4 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 4 3 3 7 7 7 7	ECE 451 ECE 452 ECE 453 ECE 454 ECE 455 ECE 456 ECE 456 ECE 457 ECE 458 ECE 460 ECE 461 ECE 462 ECE 463 ECE 466 ECE 467 ECE 468 ECE 467 ECE 472 ECE 473 ECE 478 ECE 480 ECE 481 ECE 485 ECE 486 ECE 487 ECE 488 ECE 488 ECE 488 ECE 488 ECE 488 ECE 489 ECE 489 ECE 490 ECE 491 ECE 492 ECE 493	Adv Microwave Measurements Electromagnetic Fields Wireless Communication Systems Antennas Optical Electronics Global Nav Satellite Systems Microwave Devices & Circuits Applic of Radio Wave Propag Communications Systems Optical Imaging Digital Communications Logic Synthesis Digital Communications Lab Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Communications Lab Biophotonics Optical Communications United Systems Optical Communications Systems Optical Communications Lab Biophotonics Divided Communications Lab Biophotonics Optical Communications Lab Biophotonics Divided Communications Logic Communications Magnetic Resonance Imaging Nanotechnology Digital IC Design Analog IC Design MEMS Devices & Systems Control Systems Intro Quantum Electr for EEs Compound Semicond & Devices Robot Dynamics and Control Introduction to Optimization Numerical Analysis Parallel Programs: Sci & Engrg Advanced Engineering Math	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

			ECE 298	Special Topics (As approved)	1 to 4
	Special Topics in ECE (As	04		Special Topics in ECE (As	01.4
ECE 398	approved)	0 to 4	ECE 398	approved)	0 to 4
505 400	Special Topics in ECE (As	0 to 4	505 400	Special Topics in ECE (As	0 to 4
ECE 498	approved) Interdisciplinary Design Proj		ECE 498	approved) Interdisciplinary Design Proj	
	(CubeSat, Solar Decathlon,			(CubeSat, Solar Decathlon,	
	Formula SAE, Baja SAE, or by	1 to 4		Formula SAE, Baja SAE, or by	1 to 4
ENG 491	Approval.)		ENG 491	Approval.)	
GEOL 107	Physical Geology	4	GEOL 107	Physical Geology	4
GEOL 208 GEOL 333	History of the Earth System Earth Materials and the Env	4	GEOL 208 GEOL 333	History of the Earth System Earth Materials and the Env	4
GEOL 380	Environmental Geology	4	GEOL 380	Environmental Geology	4
GEOL 411	Structural Geol and Tectonics	4	GEOL 411	Structural Geol and Tectonics	4
	Geol Field Methods, Western US	6		Geol Field Methods, Western US	6
GEOL 417	, , , , , , , , , , , , , , , , , , , ,		GEOL 417		
GEOL 432	Mineralogy and Mineral Optics	4	GEOL 432	Mineralogy and Mineral Optics	4
GEOL 436	Petrology and Petrography	4	GEOL 436	Petrology and Petrography	4
	Sedimentology and Stratigraphy	4		Sedimentology and Stratigraphy	4
GEOL 440 GEOL 450	Probing the Earth's Interior	3	GEOL 440 GEOL 450	Probing the Earth's Interior	3
GEOL 452	Introduction to Geophysics	4	GEOL 450 GEOL 452	Introduction to Geophysics	4
GEOL 460	Geochemistry	3	GEOL 452 GEOL 460	Geochemistry	3
0202 100	Deterministic Models in		0202 100	Deterministic Models in	
IE 310	Optimization	3	IE 310	Optimization	3
IE 330	Industrial Quality Control	3	IE 330	Industrial Quality Control	3
IE 360	Facilities Planning and Design	3	IE 360	Facilities Planning and Design	3
IE 360			IE 300		
IE 361	Production Planning & Control	3	IE 361	Production Planning & Control	3
	Design & Anlys of Experiments	3 or 4		Design & Anlys of Experiments	3 or 4
IE 400	besign & Annys of Experiments	3014	IE 400	Design & Annys of Experiments	3014
	Advanced Topics in Stochastic	3 or 4		Advanced Topics in Stochastic	3 or 4
IE 410	Processes & Applications	3014	IE 410	Processes & Applications	3014
	Optimization of Large Systems	3 or 4		Optimization of Large Systems	3 or 4
IE 411		3 01 4	IE 411		
IE 412	OR Models for Mfg Systems	3 or 4	IE 412	OR Models for Mfg Systems	3 or 4
IE 413	Simulation	3 or 4	IE 413	Simulation	3 or 4
IE 420	Financial Engineering	3 or 4	IE 420	Financial Engineering	3 or 4
IE 430	Economic Found of Quality Syst	3 or 4	IE 430	Economic Found of Quality Syst	3 or 4
IE 431	Design for Six Sigma	3	IE 431	Design for Six Sigma	3
	Organismal & Evolutionary Biol	4		Organismal & Evolutionary Biol	4
IB 150			IB 150	-	
IB 202	Physiology	3 or 4	IB 202	Physiology	3 or 4
IB 203	Ecology	4	IB 203	Ecology	4
IB 204 IB 302	Genetics Evolution	3 or 4 4	IB 204 IB 302	Genetics Evolution	3 or 4 4
IB 335	Plant Systematics	4	IB 335	Plant Systematics	4
IB 348	Fish and Wildlife Ecology	3	IB 348	Fish and Wildlife Ecology	3
IB 368	Vertebrate Natural History	4	IB 368	Vertebrate Natural History	4
IB 401	Introduction to Entomology	3 or 4	IB 401	Introduction to Entomology	3 or 4
IB 405	Evolution of Traits and Genomes	3	IB 405	Evolution of Traits and Genomes	3
IB 420	Plant Physiology	3	IB 420	Plant Physiology	3
IB 421	Photosynthesis	3	IB 421	Photosynthesis	3
	Env and Evol Physl of Animals	3		Env and Evol Physl of Animals	3
IB 426			IB 426		
IB 427	Insect Physiology	4	IB 427	Insect Physiology	4
IB 431	Behavioral Ecology	3	IB 431 IB 432	Behavioral Ecology	3
IB 432 IB 440	Genes and Behavior Plants and Global Change	3	IB 440	Genes and Behavior Plants and Global Change	3
IB 443	Evolutionary Ecology	3	IB 443	Evolutionary Ecology	3
IB 444	Insect Ecology	3 or 4	IB 444	Insect Ecology	3 or 4
IB 451	Conservation Biology	4	IB 451	Conservation Biology	4
IB 452	Ecosystem Ecology	3	IB 452	Ecosystem Ecology	3
IB 453	Community Ecology	3	IB 453	Community Ecology	3
IB 461	Ornithology	4	IB 461	Ornithology	4
IB 462	Mammalogy	4	IB 462	Mammalogy	4
IB 463 IB 464	Ichthyology	4	IB 463 IB 464	Ichthyology	4
10 404	Herpetology Principles of Systematics	4	IB 464 IB 467	Herpetology Principles of Systematics	4
IB 467	sipies or systematics			Insect Classification and Evol	4
IB 467 IB 468	Insect Classification and Evol	4	IB 468		
	Insect Classification and Evol General Mycology	4 4	IB 471	General Mycology	4
IB 468					1
IB 468 IB 471 IB 472 IB 473	General Mycology Plant Molecular Biology Plant Genomics	4 1 1	IB 471 IB 472 IB 473	General Mycology Plant Molecular Biology Plant Genomics	1 1
IB 468 IB 471 IB 472 IB 473 IB 481	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases	4 1 1 4	IB 471 IB 472 IB 473 IB 481	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases	1 1 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management	4 1 1 4 3	IB 471 IB 472 IB 473 IB 481 IB 482	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management	1 1 4 3
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology	4 1 1 4 3 3	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology	1 1 4 3
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health	4 1 1 4 3 3 3	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health	1 1 4 3 3
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology	4 1 1 4 3 3 3 3 3 or 4	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology	1 1 4 3 3 3 3 3 or 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism	4 1 1 4 3 3 3	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism	1 1 4 3 3
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational	4 1 1 4 3 3 3 3 3 or 4	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational	1 1 4 3 3 3 3 3 or 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics	4 1 1 4 3 3 3 3 3 3 3 3 3 3 7 4 4	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics	1 1 4 3 3 3 3 3 or 4 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis	4 1 1 4 3 3 3 3 3 3 3 4 4	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis	1 1 4 3 3 3 3 3 or 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics	4 1 1 4 3 3 3 3 3 3 3 7 4 4 3 3 3 3 3 3 3 3 7 7 4 4 4 3 3 7 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics	1 1 4 3 3 3 3 3 or 4 4 3 or 4 3 or 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407 LING 427	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis Language and the Brain Engineering Materials	4 1 1 4 3 3 3 3 3 3 or 4 4 3 3 3 3 7 7	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407 LING 427	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis Language and the Brain Engineering Materials	1 1 4 3 3 3 3 or 4 4 3 or 4 3 or 4 3 or 4
IB 468 IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407 LING 407 LING 427 MSE 280	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis Language and the Brain Engineering Materials	4 1 1 4 3 3 3 3 3 3 or 4 4 3 3 3 3 7 7	IB 471 IB 472 IB 473 IB 481 IB 482 IB 483 IB 485 IB 486 LING 300 LING 406 LING 407 LING 427 MSE 280	General Mycology Plant Molecular Biology Plant Genomics Vector-borne Diseases Insect Pest Management Insect Pathology Environ Toxicology & Health Pesticide Toxicology Anat & Physiol Spch Mechanism Introduction to Computational Linguistics Logic and Linguistic Analysis Language and the Brain Engineering Materials	1 1 4 3 3 3 3 or 4 4 3 or 4 3 or 4 3 or 4

MATH 347	Fundamental Mathematics	3	MATH 347	Fundamental Mathematics	3
	Fundamental Mathematics-ACP	4		Fundamental Mathematics-ACP	4
MATH 348	Tundamental Watternaties Aci	7	MATH 348	randamental Wathernaties Aer	7
MATH 357	Numerical Methods I	3	MATH 357	Numerical Methods I	3
MATH 402	Non Euclidean Geometry	3 or 4	MATH 402	Non Euclidean Geometry	3 or 4
MATH 403	Euclidean Geometry	3 or 4	MATH 403	Euclidean Geometry	3 or 4
MATH 412	Graph Theory	3 or 4	MATH 412	Graph Theory	3 or 4
MATH 413	Intro to Combinatorics	3 or 4	MATH 413	Intro to Combinatorics	3 or 4
MATH 414	Mathematical Logic	3 or 4	MATH 414	Mathematical Logic	3 or 4
MATH 416	Abstract Linear Algebra	3 or 4		-	
MATH 417	Intro to Abstract Algebra	3 or 4	MATH 417	Intro to Abstract Algebra	3 or 4
MATH 418	Intro to Abstract Algebra II	3 or 4	MATH 418	Intro to Abstract Algebra II	3 or 4
MATH 423	Differential Geometry	3 or 4	MATH 423	Differential Geometry	3 or 4
MATH 424	Honors Real Analysis	3	MATH 424	Honors Real Analysis	3
MATH 425	Honors Advanced Analysis	3	MATH 425	Honors Advanced Analysis	3
MATH 427	Honors Abstract Algebra	3	MATH 427	Honors Abstract Algebra	3
MATH 428	Honors Topics in Mathematics	3	MATH 428	Honors Topics in Mathematics	3
MATH 432	Set Theory and Topology	3 or 4	MATH 432	Set Theory and Topology	3 or 4
MATH 442	Intro Partial Diff Equations	3 or 4	MATH 442	Intro Partial Diff Equations	3 or 4
MATH 444	Elementary Real Analysis	3 or 4	MATH 444	Elementary Real Analysis	3 or 4
MATH 446	Applied Complex Variables	3 or 4	MATH 446	Applied Complex Variables	3 or 4
MATH 447	Real Variables	3 or 4	MATH 447	Real Variables	3 or 4
MATH 448	Complex Variables	3 or 4	MATH 448	Complex Variables	3 or 4
MATH 450	Numerical Analysis	3 or 4	MATH 450	Numerical Analysis	3 or 4
MATH 453	Number Theory	3 or 4	MATH 453	Number Theory	3 or 4
MATH 473	Algorithms	4	MATH 473	Algorithms	4
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MATH 475	Formal Models of Computation	3 or 4	MATH 475	Formal Models of Computation	3 or 4
MATH 481	Vector and Tensor Analysis	3 or 4	MATH 481	Vector and Tensor Analysis	3 or 4
MATH 482	Linear Programming	3 or 4	MATH 482	Linear Programming	3 or 4
MATH 484	Nonlinear Programming	3 or 4	MATH 484	Nonlinear Programming	3 or 4
MATH 487	Advanced Engineering Math	3 or 4	MATH 487	Advanced Engineering Math	3 or 4
MATH 489	Dynamics & Differential Eqns	3 or 4	MATH 489	Dynamics & Differential Eqns	3 or 4
MCB 150	Molec & Cellular Basis of Life	4	MCB 150	Molec & Cellular Basis of Life	4
MCB 250	Molecular Genetics	3	MCB 250	Molecular Genetics	3
WCB 230	Wolecular Genetics	3	WCB 230	Wolecular Genetics	3
MCB 251	Exp Techniqs in Molecular Biol	2	MCB 251	Exp Techniqs in Molecular Biol	2
WCB 231			WCB 231		
MCB 252	Cells, Tissues & Development	3	MCB 252	Cells, Tissues & Development	3
MCB 252	Exp Techniqs in Cellular Biol	2	MCB 253	Exp Techniqs in Cellular Biol	2
MCB 300		3	MCB 300		3
MCB 301	Microbiology Experimental Microbiology	3	MCB 301	Microbiology Experimental Microbiology	3
IVICB 301	Experimental Microbiology	3	NICB 301	Experimental Microbiology	3
MCB 314	Introduction to Neurobiology	3	MCB 314	Introduction to Neurobiology	3
	Caratian and Disassa	4		Caratias and Disassa	4
MCB 316	Genetics and Disease		MCB 316	Genetics and Disease	3
MCB 354	Biochem & Phys Basis of Life	3	MCB 354	Biochem & Phys Basis of Life	
MCB 400	Cancer Cell Biology	3	MCB 400	Cancer Cell Biology	3
MCB 401	Cellular Physiology	3	MCB 401	Cellular Physiology	3
MCB 402	Sys & Integrative Physiology	3	MCB 402	Sys & Integrative Physiology	3
1460 400	Cell & Membrane Physiology Lab	1 or 2	1400 400	Cell & Membrane Physiology Lab	1 or 2
MCB 403			MCB 403		
MCB 404	Sys & Integrative Physiol Lab	1 to 2	MCB 404	Sys & Integrative Physiol Lab	1 to 2
1460 406	Gene Expression & Regulation	3	14CD 40C	Gene Expression & Regulation	3
MCB 406	In the second second	2	MCB 406	Inches and a second	2
MCB 408	Immunology	3	MCB 408	Immunology	3
	Developmental Biology, Stem	2		Developmental Biology, Stem	2
1400 440	Cells and Regenerative Medicine	3	1400 440	Cells and Regenerative Medicine	3
MCB 410	Entroduction	2	MCB 410		2
MCB 413	Endocrinology	3	MCB 413	Endocrinology	3
	Brain, Behavior & Info Process	3		Brain, Behavior & Info Process	3
MCB 419			MCB 419		
MCB 421	Microbial Genetics	3	MCB 421	Microbial Genetics	3
MCB 424	Microbial Biochemistry	3	MCB 424	Microbial Biochemistry	3
MCB 426	Bacterial Pathogenesis	3	MCB 426	Bacterial Pathogenesis	3
MCB 430	Molecular Microbiology	3	MCB 430	Molecular Microbiology	3
MCB 431	Microbial Physiology	3	MCB 431	Microbial Physiology	3
MCB 422	Virology & Viral Pathogenesis	3	MCB 422	Virology & Viral Pathogenesis	3
MCB 433		l	MCB 433		
MCB 435	Evolution of Infectious Disease	3	MCB 435	Evolution of Infectious Disease	3
MCB 435 MCB 446	Physical Biochemistry	3		Physical Biochemistre	3
	Physical Biochemistry	3	MCB 446 MCB 480	Physical Biochemistry	3
MCB 480 ME 200	Eukaryotic Cell Signaling Thermodynamics	3		Eukaryotic Cell Signaling	3
ME 200	Thermodynamics	Ĭ	ME 200	Thermodynamics	J
ME 310	Fundamentals of Fluid Dynamics	4	ME 310	Fundamentals of Fluid Dynamics	4
ME 320	Heat Transfer	4	ME 320	Heat Transfer	4
ME 330	Engineering Materials	4	ME 330	Engineering Materials	4
330			550		
ME 340	Dynamics of Mechanical Systems	3.5	ME 340	Dynamics of Mechanical Systems	3.5
ME 370	Mechanical Design I	3	ME 370	Mechanical Design I	3
	-	3	ME 371	Mechanical Design II	3
		-	ME 400	Energy Conversion Systems	
ME 371	Mechanical Design II	2 or 4		FUCIES COUSELPION PASIGINS	3 or 4
ME 400	Energy Conversion Systems	3 or 4			2 or 4
ME 400 ME 401	Energy Conversion Systems Refrigeration and Cryogenics	3 or 4	ME 401	Refrigeration and Cryogenics	3 or 4
ME 400 ME 401 ME 402	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems	3 or 4 3 or 4	ME 401 ME 402	Refrigeration and Cryogenics Design of Thermal Systems	3 or 4
ME 400 ME 401	Energy Conversion Systems Refrigeration and Cryogenics	3 or 4	ME 401	Refrigeration and Cryogenics	
ME 400 ME 401 ME 402 ME 403	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems	3 or 4 3 or 4	ME 401 ME 402 ME 403	Refrigeration and Cryogenics Design of Thermal Systems	3 or 4
ME 400 ME 401 ME 402 ME 403	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics	3 or 4 3 or 4 3 or 4	ME 401 ME 402 ME 403 ME 404	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics	3 or 4 3 or 4 4
ME 400 ME 401 ME 402 ME 403 ME 404 ME 410	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics	3 or 4 3 or 4 3 or 4 4 3 or 4	ME 401 ME 402 ME 403 ME 404 ME 410	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics	3 or 4 3 or 4 4 3 or 4
ME 400 ME 401 ME 402 ME 403	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics	3 or 4 3 or 4 3 or 4	ME 401 ME 402 ME 403 ME 404	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics	3 or 4 3 or 4 4
ME 400 ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics	3 or 4 3 or 4 3 or 4 4 3 or 4	ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics	3 or 4 3 or 4 4 3 or 4
ME 400 ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics Viscous Flow & Heat Transfer Numerical Thermo-Fluid Mechs	3 or 4 3 or 4 3 or 4 4 3 or 4 4 2 to 4	ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics Viscous Flow & Heat Transfer Numerical Thermo-Fluid Mechs	3 or 4 3 or 4 4 3 or 4 4 2 to 4
ME 400 ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Energy Conversion Systems Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics Viscous Flow & Heat Transfer	3 or 4 3 or 4 3 or 4 4 3 or 4 4	ME 401 ME 402 ME 403 ME 404 ME 410 ME 411	Refrigeration and Cryogenics Design of Thermal Systems Internal Combustion Engines Intermediate Thermodynamics Intermediate Gas Dynamics Viscous Flow & Heat Transfer	3 or 4 3 or 4 4 3 or 4 4

ME 430	Failure of Engrg Materials	3 or 4	ME 430	Failure of Engrg Materials	3 or 4
	Mechanical Component Failure	3 or 4		Mechanical Component Failure	3 or 4
ME 431	Mechanical Component Failure	3 01 4	ME 431	Mechanical Component Failure	3 01 4
	Kinem & Dynamics of Mech Syst	3 or 4		Kinem & Dynamics of Mech Syst	3 or 4
ME 440	Killetti & Dyriattiics of Wecti Syst	3 01 4	ME 440	Killetti & Dyriattics of Mech Syst	3 01 4
ME 445	Introduction to Robotics	4	ME 445	Introduction to Robotics	4
ME 450	Course ME 450 Not Found				
	Computer-Aided Mfg Systems	3 or 4		Computer-Aided Mfg Systems	3 or 4
ME 451	compater raded ring systems	3 0.1 .	ME 451	compater ruded ring systems	50
	Num Control of Mfg Processes	3 or 4		Num Control of Mfg Processes	3 or 4
ME 452			ME 452		
ME 460	Industrial Control Systems	4	ME 460	Industrial Control Systems	4
	Computer Cntrl of Mech Systems	3 or 4		Computer Cntrl of Mech Systems	3 or 4
ME 461			ME 461		
ME 471	Finite Element Analysis	3 or 4	ME 471	Finite Element Analysis	3 or 4
ME 472 ME 485	Introduction to Tribology	3 or 4	ME 472 ME 485	Introduction to Tribology	3 or 4 3
IVIE 403	MEMS Devices & Systems MEMS-NEMS Theory &	3	IVIE 403	MEMS Devices & Systems MEMS-NEMS Theory &	3
ME 487	Fabrication	4	ME 487	Fabrication	4
MUS 407	Elect Music Techniques I	3	MUS 407	Elect Music Techniques I	3
MUS 409	Elec Music Techniques II	2	MUS 409	Elec Music Techniques II	2
NEUR 453	Cog Neuroscience of Vision	3 or 4	NEUR 453	Cog Neuroscience of Vision	3 or 4
NPRE 201	Energy Systems	2 or 3	NPRE 201	Energy Systems	2 or 3
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NPRE 247	Modeling Nuclear Energy System	3	NPRE 247	Modeling Nuclear Energy System	3
NPRE 402	Nuclear Power Engineering	3 or 4	NPRE 402	Nuclear Power Engineering	3 or 4
	Nuclear Power Econ & Fuel				
NPRE 412	Mgmt	3 or 4	NPRE 412	Nuclear Power Econ & Fuel Mgmt	3 or 4
NPRE 421	Plasma and Fusion Science	3	NPRE 421	Plasma and Fusion Science	3
NPRE 423	Plasma Laboratory	2	NPRE 423	Plasma Laboratory	2
NPRE 429	Plasma Engineering	3	NPRE 429	Plasma Engineering	3
NPRE 431	Materials in Nuclear Engrg	3	NPRE 431	Materials in Nuclear Engrg	3
NPRE 432	Nuclear Engrg Materials Lab	2	NPRE 432	Nuclear Engrg Materials Lab	2
NPRE 435	Radiological Imaging	3	NPRE 435	Radiological Imaging	3
NPRE 441	Radiation Protection	4	NPRE 441	Radiation Protection	4
	Radioactive Waste Management	,		Radioactive Waste Management	3
NPRE 442	Radioactive waste Management	3	NPRE 442	Radioactive waste Management	3
	Nuclear Analytical Methods Lab	2 or 2		Nuclear Analytical Methods Lab	2 or 3
NPRE 444	Nuclear Analytical Michigas East		NPRE 444	Nuclear Analytical Michigas East	
NPRE 446	Radiation Interact w/Matter I	3	NPRE 446	Radiation Interact w/Matter I	3
	Radiation Interact w/Matter II	3		Radiation Interact w/Matter II	3
NPRE 447			NPRE 447		
NPRE 448	Nuclear Syst Engrg & Design	4	NPRE 448	Nuclear Syst Engrg & Design	4
NPRE 451	NPRE Laboratory	3	NPRE 451	NPRE Laboratory	3
	Neutron Diffusion & Transport	4		Neutron Diffusion & Transport	4
NPRE 455			NPRE 455		
NPRE 457	Safety Anlys Nucl Reactor Syst	3 or 4	NPRE 457	Safety Anlys Nucl Reactor Syst	3 or 4
NPRE 458	Design in NPRE	4	NPRE 457	Design in NPRE	4
NFRE 430	Designininere	4	NPRE 430	Designinnere	4
NPRE 470	Fuel Cells & Hydrogen Sources	3	NPRE 470	Fuel Cells & Hydrogen Sources	3
NPRE 475	Wind Power Systems	3 or 4	NPRE 475	Wind Power Systems	3 or 4
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PHYS 225	Relativity & Math Applications	2	PHYS 225	Relativity & Math Applications	2
PHYS 325	Classical Mechanics I	3	PHYS 325	Classical Mechanics I	3
PHYS 326	Classical Mechanics II	3	PHYS 326	Classical Mechanics II	3
PHYS 401	Classical Physics Lab	3	PHYS 401	Classical Physics Lab	3
PHYS 402	Light	3 or 4	PHYS 402	Light	3 or 4
	Markey Sanday and Shaday	4 5		Made of Section (III)	
PHYS 403	Modern Experimental Physics	4 or 5	PHYS 403	Modern Experimental Physics	4 or 5
PHYS 406	Acoustical Physics of Music	4	PHYS 406	Acoustical Physics of Music	4
PHYS 419	Space, Time, and Matter-ACP	3 or 4	PHYS 419	Space, Time, and Matter-ACP	3 or 4
PHYS 420	Space, Time, and Matter	2	PHYS 420	Space, Time, and Matter	2
PHYS 427	Thermal & Statistical Physics	4	PHYS 427	Thermal & Statistical Physics	4
PHYS 460	Condensed Matter Physics	4	PHYS 460	Condensed Matter Physics	4
PHYS 466	Atomic Scale Simulations	3 or 4	PHYS 466	Atomic Scale Simulations	3 or 4
PHYS 470	Subatomic Physics	4	PHYS 470	Subatomic Physics	4
	Atomic Phys 9. Overton The	,		Atomic Dhus 9. Ownstress The	2
PHYS 485	Atomic Phys & Quantum Theory	3	PHYS 485	Atomic Phys & Quantum Theory	3
PHYS 486	Quantum Physics I	4	PHYS 486	Quantum Physics I	4
PHYS 487	Quantum Physics II	4	PHYS 487	Quantum Physics II	4
PSYC 204	Intro to Brain and Cognition	3	PSYC 204	Intro to Brain and Cognition	3
SHS 200	General Phonetics	3	SHS 200	General Phonetics	3
	Intro Sound & Hearing Science	3		Intro Sound & Hearing Science	3
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cus ann	Anat & Physiol Spch Mechanism	4	C11C 20C	Anat & Physiol Spch Mechanism	4
SHS 300			SHS 300		
SHS 301	General Speech Science	4	SHS 301	General Speech Science	4
SH2 320	Development of Spoken	3	CHC 330	Development of Spoken Language	3
SHS 320	Language		SHS 320		
SHS 450	Intro Audiol & Hear Disorders	4	SHS 450	Intro Audiol & Hear Disorders	4
SHS 450 SHS 470	Neural Bases Spch Lang	4	SHS 470	Neural Bases Spch Lang	4
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STAT 420	Methods of Applied Statistics	3 or 4	STAT 420	Methods of Applied Statistics	3 or 4
STAT 424	Analysis of Variance	3 or 4	STAT 424	Analysis of Variance	3 or 4
]	, and , sid or variantee	_ 0. 7	STAT 475	Statistical Modeling I	3 or 4
STAT 428	Statistical Computing	3 or 4	STAT 428	Statistical Computing	3 or 4
STAT 429	Time Series Analysis	3 or 4	STAT 429	Time Series Analysis	3 or 4
STAT 440	Statistical Data Management	3 or 4	STAT 440	Statistical Data Management	3 or 4
	Reliability Engineering	3 or 4	SE 411	Reliability Engineering	3 or 4
SE 411					
SE 411 SE 420	Digital Control Systems	4	SE 420	Digital Control Systems	4

electives: ECE 391 Computer Systems Engineering or CS 225 Data Structures CCE 310 Digital Signal Processing ECE 330 Power Ckts & Electromechanics ECE 342 ELECTronic Circuits ECE 342 ELECTRONIC Circuits ECE 343 ELECTRONIC Circuits ECE 344 ECE 345 ECE 346 ECE 347 ECE 348 ECE 348 ECE 349 Computer Systems Engineering Advanced Digital Projects Lab ECE 349 ECE 402 Electronic Music Synthesis ECE 402 ECE 415 Biomedical Instrumentation Lab ECE 402 ECE 415 ELECTRONIC Music Synthesis ECE 420 ECE 431 ELECTRONIC Music Synthesis ECE 420 ECE 431 ELECTRONIC Music Synthesis ECE 430 ECE 431 ELECTRONIC Music Synthesis ECE 432 ECE 433 ECE 434 ECE 434 ELECTRONIC Music Synthesis ECE 440 ENDERGRAPH COMPUTER				Ī
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TAM 251 Introductory Solid Mechanics 3 TAM 234 Behavior of Materials 4 TAM 324 TAM 324 TAM 325 Introductory Fluid Mechanics 4 TAM 327 TAM 328 Introductory Fluid Mechanics 4 TAM 412 TAM 412 Intermediate Fluid Mechanics 4 TAM 412 TAM 4	TAM 211	Statics	3	TAM 211
TAM 324 Behavior of Materials 4 TAM 325 Introductory Fluid Mechanics 4 TAM 315 Introductory Fluid Mechanics 4 TAM 412 Intermediate Dynamics 4 TAM 412 TAM 415 Intermediate Dynamics 4 TAM 412 TAM 415 Continuum Mechanics 4 TAM 445 Continuum Mechanics 4 TAM 445 Continuum Mechanics 4 TAM 445 TAM 445 Continuum Mechanics 4 TAM 445 TAM 445 Continuum Mechanics 4 TAM 445 TA	TAM 212	Introductory Dynamics	3	TAM 212
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TAM 412 Intermediate Fluid Mechanics 4 TAM 435 Intermediate Fluid Mechanics 4 TAM 435 Continuum Mechanics 4 TAM 435 TAM 445 Continuum Mechanics 4 TAM 435 TAM 445 Continuum Mechanics 4 TAM 435 TAM 445 TAM 445 TAM 45 TAM 445	TAM 324	Behavior of Materials	4	TAM 324
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ECE 391 Computer Systems Engineering ECE 310 Digital Signal Processing ECE 310 Digital Signal Processing ECE 310 ECE 330 ECE 342 ELectronic Circuits ECE 343 EECE 345 ECE 346 ECE 347 ECE 348 ECE 348 ECE 349 ECE 349 ECE 349 ECE 349 ECE 341 ECE 341 ECE 341 ECE 342 ELectronic Circuits Laboratory I ECE 343 ELectronic Circuits Laboratory I ECE 344 ECE 345 ECE 346 ECE 347 ECE 348 ECE 349 ECE 340 ECE 341 ECE 341 ECE 341 ECE 342 ECE 343 ECE 344 ECE 343 ECE 344 ECE 344 ECE 345 ECE 346 ECE 346 ECE 415 ECE 420 Embedded DSP Laboratory ECE 431 ECE 432 ECE 433 ECE 433 ECE 434 ECE 444 ECE 444 ECE 444 ECE 444 ECE 446 Engineering ECE 447 Active Microwave Ckt Design ECE 446 Engineering ECE 446 Engineering ECE 446 Engineering ECE 446 Engineering ECE 447 Active Microwave Measurements ECE 446 Engineering ECE 446 Engineering ECE 446 Engineering ECE 447 Active Microwave Measurements ECE 446 Engineering ECE 446 Engineering ECE 446 Engineering ECE 446 ECE 446 Engineering ECE 447 Active Microwave Ckt Design ECE 446 ECE 446 Engineering ECE 446 Engineering ECE 446 ECE 446 ECE 446 ECE 446 Engineering ECE 446 ECE 446 ECE 446 Engineering ECE 446 EC				Select three cou
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ECE 350 Select three ECE labs identified below. At least one must be hardware labs Hardware Labs: ECE 343 ELECTORIC Circuits Laboratory ECE 391 Computer Systems Engineering ECE 395 Advanced Digital Projects Lab ECE 396 ECE 402 Electronic Music Synthesis ECE 402 Electronic Music Synthesis ECE 415 Biomedical Instrumentation Lab ECE 415 ECE 420 Embedded DSP Laboratory ECE 431 ELECT Adachinery Computer Networking CS 436 Laboratory Computer Networking CS 436 CEE 437 Sensors and Instrumentation ECE 438 ECE 439 Wireless Networks ECE 439 Wireless Networks CEE 439 ECE 444 ECE 443 ECE 444 Brinciples of Experimental Research in Electrical ECE 447 Active Microwave Ckt Design ECE 447 ECE 451 Adv Microwave Measurements ECE 456 Global Nav Satellite Systems ECE 456 Global Nav Satellite Systems ECE 456 CCE 460 Optical Imaging ECE 466 Optical Communications Lab ECE 466 Coptical Communications Lab ECE 467 ECE 468 Optical Remote Sensing ECE 469 Power Electronics Laboratory ECE 468 ECE 469 Power Electronics Laboratory ECE 481 Nanotechnology A ECE 481 Nanotechnology A ECE 481 Nanotechnology A ECE 481 ECE 489 Robot Dynamics and Control ECE 489 ECE 495 Photonic Device Laboratory Software Labs ECE 311 Digital Signal Processing Lab ECE 314 ECE 314 ECE 314 ECE 315 ECE 315 ECE 315 ECE 315 ECE 316	ECE 330	Power Ckts & Electromechanics		ECE 330
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ECE 453 Systems ECE 453 ECE 456 Global Nav Satellite Systems 4 ECE 456 ECE 456 Global Nav Satellite Systems 4 ECE 456 ECE 460 Optical Imaging 4 ECE 460 ECE 463 Digital Communications Lab 2 ECE 463 ECE 466 Optical Communications Lab 1 ECE 466 ECE 468 Optical Remote Sensing 3 ECE 466 ECE 469 Power Electronics Laboratory 2 ECE 469 ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 485 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 486 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 D	· ·*=	Wireless Communication	4	
## ECE 456 Global Nav Satellite Systems 4	ECE 453		4	ECE 453
ECE 460 Optical Imaging 4 ECE 460 ECE 463 Digital Communications Lab 2 ECE 463 ECE 466 Optical Communications Lab 1 ECE 466 ECE 468 Optical Remote Sensing 3 ECE 468 ECE 469 Power Electronics Laboratory 2 ECE 469 ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365		The state of the s	4	
ECE 463 Digital Communications Lab 2 ECE 463 ECE 466 Optical Communications Lab 1 ECE 466 ECE 468 Optical Remote Sensing 3 ECE 468 ECE 469 Power Electronics Laboratory 2 ECE 469 ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs ECE 311 ECE 311 ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365			4	
ECE 468 Optical Remote Sensing 3 ECE 468 ECE 469 Power Electronics Laboratory 2 ECE 469 ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 463		2	ECE 463
ECE 469 Power Electronics Laboratory 2 ECE 469 ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 466	Optical Communications Lab	1	ECE 466
ECE 470 Introduction to Robotics 4 ECE 470 ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 468	Optical Remote Sensing	3	ECE 468
ECE 481 Nanotechnology 4 ECE 481 ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs Isoftware Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 469		2	ECE 469
ECE 486 Control Systems 4 ECE 486 ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: Software Labs Software Labs ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 470	Introduction to Robotics	4	ECE 470
ECE 489 Robot Dynamics and Control 4 ECE 489 ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 481	Nanotechnology	4	ECE 481
ECE 495 Photonic Device Laboratory 3 ECE 495 Software Labs: ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365	ECE 486	Control Systems	4	ECE 486
Software Labs: ECE 311 Digital Signal Processing Lab 1 ECE 314 Probability in Engineering Lab 1 ECE 314 Data Science and Engineering 3 ECE 365	ECE 489	Robot Dynamics and Control	4	
ECE 311 Digital Signal Processing Lab 1 ECE 311 ECE 314 Probability in Engineering Lab 1 ECE 314 ECE 365 Data Science and Engineering 3 ECE 365		Photonic Device Laboratory	3	
Probability in Engineering Lab 1 ECE 314 Data Science and Engineering 3 ECE 365				Software Labs:
ECE 314 Data Science and Engineering 3 ECE 365 ECE 365	ECE 311	Digital Signal Processing Lab	1	ECE 311
ECE 365 Data Science and Engineering 3 ECE 365	ECE 314	Probability in Engineering Lab	1	ECE 314
ECE 365	-	Data Science and Engineering	2	
Computer Organization 9 Design 4	ECE 365	Data Science and Engineering	5	ECE 365
ECE 411 Computer Organization & Design 4 ECE 411	FCF 411	Computer Organization & Design	4	FCE 411

Total Hours of Curriculum to Graduate	4.
least 128 credit hours earned toward the degree. 8	
Free electives. Additional unrestricted course work, subject to certain exceptions as noted by the College, so that there are at	
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts ⁷	
Gen Ed (SBS + HA + Comp I)	:
Electives	

SE 424	State Space Design for Control	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 324	Behavior of Materials	4
TAM 335	Introductory Fluid Mechanics	4
TAM 412	Intermediate Dynamics	4
TAM 435	Intermediate Fluid Mechanics	4
TAM 445	Continuum Mechanics	4
IAWI 443		•
TAM 451	Intermediate Solid Mechanics	4
Select three courses from the foll	owing list of Advanced Core ECE	
electives:		
ECE 391	Computer Systems Engineering	
or CS 225	Data Structures	
ECE 310	Digital Signal Processing	
	Power Ckts & Electromechanics	
ECE 330		
ECE 342 ECE 350	Electronic Circuits Fields and Waves II	
Select three courses from the foll		
one must be a Hardware Lab.		
Hardware Labs:		
ECE 343	Electronic Circuits Laboratory	1
FCF 201	Computer Systems Engineering	4
ECE 391		
ECE 395	Advanced Digital Projects Lab	2 or 3
ECE 402	Electronic Music Synthesis	3
	Biomedical Instrumentation Lab	2
ECE 415		
ECE 420	Embedded DSP Laboratory	2
ECE 431	Electric Machinery	4
CS 436	Computer Networking Laboratory	3 or 4
ECE 437	Sensors and Instrumentation	3
ECE 438	Communication Networks	3 or 4
ECE 439	Wireless Networks	3 or 4
ECE 443	LEDs and Solar Cells	4
505.444	IC Device Theory & Fabrication	4
ECE 444	•	
	Principles of Experimental	4
ECE 446	Research in Electrical Engineering	
ECE 447	Active Microwave Ckt Design	3
	Adv Microwave Measurements	3
ECE 451		-
ECE 453	Wireless Communication Systems	4
ECE 453 ECE 456	Global Nav Satellite Systems	4
ECE 460	Optical Imaging	4
ECE 463	Digital Communications Lab	2
ECE 466	Optical Communications Lab	1
ECE 468	Optical Remote Sensing	3
ECE 469	Power Electronics Laboratory	2
ECE 470 ECE 481	Introduction to Robotics	4
ECE 481 ECE 486	Nanotechnology Control Systems	4
ECE 489	Robot Dynamics and Control	4
ECE 495	Photonic Device Laboratory	3
Software Labs:		
ECE 311	Digital Signal Processing Lab	1
ECE 214	Probability in Engineering Lab	1
ECE 314		
ECE 365	Data Science and Engineering	3
	0	
ECE 411	Computer Organization & Design	4
ECE 494	Drinciples of Cafe Autonomy	

Gen Ed (SBS + HA + Comp I)	16
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts ⁷	6
Free electives. Additional unrestricted course work, subject to certain exceptions as noted by the College, so that there are at least 128 credit hours earned toward the degree. 8	12

- ¹ External transfer students take ENG 300 instead.
- MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.
- 3 Freshmen take ECE 110 for 3 credit hours. Lab-only version taken by transfer students (with special permission) is 1 credit hour.
- ⁴ STAT 410 may be substituted.
- ⁵ ECE 496 AND ECE 499 may be substituted.
- Advanced Composition may be satisfied by completing ECE 445, or a course in either the general education or free elective categories which has the Advanced Composition designation.
- The Grainger College of
 Engineering approved liberal
 education course list can be
 found here. Note that these
 credit hours could carry the
 required cultural studies,
 designation required for campus
 general education requirements.
- The Grainger College of
 Engineering restrictions to free
 electives can be found here.

External transfer students ¹ take ENG 300 instead.

MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background

in calculus.
Freshmen take ECE 110 for 3
credit hours. Lab-only version
taken by transfer students (with
special permission) is 1 credit

3 hour.

- ⁴ STAT 410 may be substituted. ECE 496 AND ECE 499 may be
- ⁵ substituted.

Advanced Composition may be satisfied by completing ECE 445, or a course in either the general education or free elective categories which has the Advanced Composition

 $^{\rm 6}$ designation.

The Grainger College of Engineering approved liberal education course list can be found here. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.

The Grainger College of Engineering restrictions to free 8 electives can be found here.

Addition					
Removal Revision CURRENT PR	ROGRAM		REVISED PR	OGRAM	
	n and Professional Development			n and Professional Development	
Code ENG 100	Title Engineering Orientation ¹	Hours	Code 0 ENG 100	Title Engineering Orientation ¹	Hours
Total Hours			0 Total Hours		
Course List	nal Mathematics and Science		Course List	nal Mathematics and Science	
Code CHEM 102	Title General Chemistry I	Hours		Title General Chemistry I	Hours
MATH 221			4 MATH 221		
MATH 231 MATH 241	Calculus II Calculus III		3 MATH 231 4 MATH 241	Calculus II Calculus III	
			MATH 257	Linear Algebra with Computational Applications Intro to Differential Eq	
PHYS 211	Intro to Differential Eq Plus University Physics: Mechanics		4 PHYS 211	University Physics: Mechanics	
PHYS 212 PHYS 213 PHYS 214	University Physics: Elec & Mag Univ Physics: Thermal Physics Univ Physics: Quantum Physics		4 PHYS 212 2 PHYS 213 2 PHYS 214	University Physics: Elec & Mag Univ Physics: Thermal Physics Univ Physics: Quantum Physics	
Total Hours	Univ Physics: Quantum Physics		31 Total Hours	Univ Physics: Quantum Physics	
Electrical I	Engineering Technical Core		Electrical E Course List	Engineering Technical Core	
Code ECE 110	Title Introduction to Electronics ³	Hours	Code 3 ECE 110	Title Introduction to Electronics ³	Hours
ECE 120 ECE 220	Introduction to Computing Computer Systems & Programming		4 ECE 120 4 ECE 220	Introduction to Computing Computer Systems & Programming	
ECE 210 ECE 313	Analog Signal Processing Probability with Engrg Applic ⁴		4 ECE 210 3 ECE 313	Analog Signal Processing Probability with Engrg Applic ⁴	
ECE 329 ECE 340	Fields and Waves I Semiconductor Electronics		3 ECE 329 3 ECE 340	Fields and Waves I Semiconductor Electronics	
ECE 385 ECE 445	Digital Systems Laboratory Senior Design Project Lab 5,6		3 ECE 385 4 ECE 445	Digital Systems Laboratory Senior Design Project Lab 5,6	
Total Hours			31 Total Hours		
Technical Course List	Electives		Technical Course List	Electives	
Code 32 hours, to i		Hours	Code 30 hours, to i		Hours
	urses from list below: Aerospace Flight Mechanics		6 Non-ECE cou 3 <u>AE 202</u>	rses from list below: Aerospace Flight Mechanics	
AE 302 AE 311	Aerospace Flight Mechanics II Incompressible Flow		3 AE 302 3 AE 311	Aerospace Flight Mechanics II Incompressible Flow	
AE 312 AE 321	Compressible Flow Mechs of Aerospace Structures		3 AE 312 3 AE 321	Compressible Flow Mechs of Aerospace Structures	
AE 352 AE 353	Aerospace Dynamical Systems Aerospace Control Systems		3 AE 352 3 AE 353	Aerospace Dynamical Systems Aerospace Control Systems	
AE 402 AE 403	Spacecraft Attitude Control	3 or 4 3 or 4	AE 402 AE 403	Orbital Mechanics Spacecraft Attitude Control	3 or 4 3 or 4
AE 410 AE 412	Computational Aerodynamics Viscous Flow & Heat Transfer	3 or 4	AE 410 4 AE 412	Computational Aerodynamics Viscous Flow & Heat Transfer	3 or 4
AE 416 AE 419	Aircraft Flight Mechanics	3 or 4 3 or 4	AE 416 AE 419	Applied Aerodynamics Aircraft Flight Mechanics	3 or 4 3 or 4
AE 420 AE 427	Finite Element Analysis Mechanics of Polymers	3 or 4	AE 420 3 AE 427	Finite Element Analysis Mechanics of Polymers	3 or 4
AE 433		3 or 4	3 AE 428 AE 433	Mechanics of Composites Aerospace Propulsion	3 or 4
AE 434 AE 435	Rocket Propulsion Electric Propulsion	3 or 4 3 or 4	AE 434 AE 435	Rocket Propulsion Electric Propulsion	3 or 4 3 or 4
AE 451 AE 460	Aeroelasticity Aerodynamics & Propulsion Lab	3 or 4	AE 451 2 AE 460	Aeroelasticity Aerodynamics & Propulsion Lab	3 or 4
ASTR 210	Eng All 300 and 400 level courses except ABE Introduction to Astrophysics	Е 440. Ехсер	3 ASTR 210	Introduction to Astrophysics	E 440. Except s
ASTR 310 ASTR 330	Computing in Astronomy Extraterrestrial Life		3 ASTR 310 3 ASTR 330	Computing in Astronomy Extraterrestrial Life	
ASTR 350 ASTR 404	The Big Bang, Black Holes, and the End of the U Stellar Astrophysics		3 ASTR 350 3 ASTR 404	The Big Bang, Black Holes, and the End of the U Stellar Astrophysics	J
ASTR 405 ASTR 406	Planetary Systems Galaxies and the Universe		3 ASTR 405 3 ASTR 406	Planetary Systems Galaxies and the Universe	
ASTR 414 ASTR 450	Astronomical Techniques Astrochemistry		4 ASTR 414 4 ASTR 450	Astronomical Techniques Astrochemistry	
ATMS 301	Atmospheric Thermodynamics			General Physical Meteorology Almospheric Thermodynamics	
ATMS 302 ATMS 303	Atmospheric Dynamics I Synoptic-Dynamic Wea Analysis		3 ATMS 302 4 ATMS 303	Atmospheric Dynamics I Synoptic-Dynamic Wea Analysis	
ATMS 304 ATMS 305	Radiative Transfer-Remote Sens Computing and Data Analysis		3 ATMS 304 3 ATMS 305	Radiative Transfer-Remote Sens Computing and Data Analysis	
ATMS 404 ATMS 405	Boundary Layer Processes	3 or 4	ATMS 404 4 ATMS 405	Risk Analysis in Earth Science Boundary Layer Processes	3 or 4
ATMS 406 ATMS 410	Tropical Meteorology Radar Remote Sensing Satellite Remote Sensing		4 ATMS 406 4 ATMS 410	Tropical Meteorology Radar Remote Sensing Satellite Remote Sensing	
ATMS 411 ATMS 420 ATMS 421	Atmospheric Chemistry Earth Systems Modeling		4 ATMS 411 4 ATMS 420 4 ATMS 421	Atmospheric Chemistry Earth Systems Modeling	
ATMS 425 ATMS 447	Air Quality Modeling Climate Change Assessment		4 ATMS 425 3 ATMS 447	Air Quality Modeling Climate Change Assessment	
ATMS 449 BIOC 406	Biogeochemical Cycles Gene Expression & Regulation		4 ATMS 449 3 BIOC 406	Biogeochemical Cycles Gene Expression & Regulation	
BIOC 440 BIOC 446	Physical Chemistry Principles Physical Biochemistry		4 BIOC 440 3 BIOC 446	Physical Chemistry Principles Physical Biochemistry	
BIOC 446 BIOC 455 BIOE 201	Physical Biochemistry Technqs Biochem & Biotech Conservation Principles Bioeng		3 BIOC 446 4 BIOC 455 3 BIOE 201	Physical Biochemistry Technqs Biochem & Biotech Conservation Principles Bioeng	
BIOE 202 BIOE 302	Conservation Principles Bioeng Cell & Tissue Engineering Lab Modeling Human Physiology		2 BIOE 202 3 BIOE 302	Conservation Principles Broeng Cell & Tissue Engineering Lab Modeling Human Physiology	
BIOE 414 BIOE 415	Biomedical Instrumentation Biomedical Instrumentation Lab			Biomedical Instrumentation Biomedical Instrumentation Lab	
BIOE 461 BIOE 467	Cellular Biomechanics Biophotonics		4 BIOE 461 3 BIOE 467	Cellular Biomechanics Biophotonics	
BIOE 476 BIOE 480	Tissue Engineering	3 or 4	3 BIOE 476 BIOE 480	Tissue Engineering Magnetic Resonance Imaging	3 or 4
Biophysics (B CHBE 221	Magnetic Resonance imaging BIOP): All 400 level courses except seminars and sp Principles of CHE	oecial topics o	ou Biophysics (B		
CHBE 321 CHBE 421	Thermodynamics Momentum and Heat Transfer		4 CHBE 321 4 CHBE 421	Thermodynamics Momentum and Heat Transfer	
CHBE 422 CHBE 424	Mass Transfer Operations Chemical Reaction Engineering			Mass Transfer Operations Chemical Reaction Engineering	
CHBE 430 CHBE 431	Unit Operations Laboratory Process Design		4 CHBE 430	Unit Operations Laboratory Process Design	
CHBE 440 CHBE 451	Process Control and Dynamics Transport Phenomena		3 CHBE 440	Process Control and Dynamics Transport Phenomena	
CHBE 452 CHBE 453	Chemical Kinetics & Catalysis		3 CHBE 452	Chemical Kinetics & Catalysis	2 or 3
CHBE 456 CHBE 457	Polymer Science & Engineering Microelectronics Processing			Polymer Science & Engineering Microelectronics Processing	
CHBE 471 CHBE 472	Biochemical Engineering Techniques in Biomolecular Eng	3 or 4 3 or 4	CHBE 471	Biochemical Engineering Techniques in Biomolecular Eng	3 or 4 3 or 4
CHBE 473 CHBE 474	Biomolecular Engineering	3 or 4 3 or 4	CHBE 473	Biomolecular Engineering Metabolic Engineering	3 or 4 3 or 4
CHEM 104	General Chemistry II General Chemistry Lab II		3 CHEM 104	General Chemistry II General Chemistry Lab II	
	HEM): All 200, 300 and 400 level except 397, 497, a Transportation Engineering	and 499. Exce		HEM): All 200, 300 and 400 level except 397, 497, Transportation Engineering	and 499. Except
CEE 330 CEE 408	Environmental Engineering Railroad Transportation Engrg	3 or 4	3 CEE 330 CEE 408	Environmental Engineering Railroad Transportation Engrg	3 or 4
CEE 410 CEE 416	Traffic Capacity Analysis	3 or 4 3 or 4	CEE 416	Railway Signaling & Control Traffic Capacity Analysis	3 or 4 3 or 4
CEE 430 CEE 447	Ecological Quality Engineering Atmospheric Chemistry		2 CEE 430 4 CEE 447	Ecological Quality Engineering Atmospheric Chemistry	
CEE 491		3 or 4	CEE 491	Decision and Risk Analysis Genetic Engineering Lab	3 or 4
CS 101 CS 173	Intro Computing: Engrg & Sci (By Approval) Discrete Structures		3 CS 101 3 CS 173	Intro Computing: Engrg & Sci (By Approval) Discrete Structures	
CS 225 CS 242	Data Structures Programming Studio		4 <u>CS 225</u> 3 <u>CS 242</u>	Data Structures Programming Studio	
CS 357	Numerical Methods I		3 CS 357	Numerical Methods I	

CS 41		3 or 4	CS 410	Text Information Systems	3 or 4	
CS 41 CS 41		3 or 4	CS 411 CS 412	Database Systems Introduction to Data Mining	3 or 4 3 or 4	
CS 41	3 Intro to Combinatorics	3 or 4	CS 413	Intro to Combinatorics	3 or 4	
CS 41 CS 41		3 or 4	CS 414 CS 418	Multimedia Systems Interactive Computer Graphics	3 or 4 3 or 4	
CS 41	9 Production Computer Graphics	3 or 4	CS 419	Production Computer Graphics	3 or 4	
CS 42 CS 42		3 or 4 3 or 4	CS 420 CS 421	Parallel Progrmg: Sci & Engrg Programming Languages & Compilers	3 or 4 3 or 4	
CS 42		3 or 4	CS 422	Programming Languages & Compliers Programming Language Design	3 or 4	
CS 42		3 or 4	CS 423 CS 424	Operating Systems Design Real-Time Systems	3 or 4	
CS 42		3 or 4	CS 424	Distributed Systems	3 or 4	
CS 42	6 Compiler Construction	3 or 4	CS 426	Compiler Construction	3 or 4	
CS 42 CS 42		3 or 4	CS 427 CS 428	Software Engineering I Software Engineering II	3 or 4 3 or 4	
CS 42	9 Software Engineering II, ACP		3 CS 429	Software Engineering II, ACP		3
CS 43 CS 43		3 or 4 3 or 4	CS 431 CS 433	Embedded Systems Computer System Organization	3 or 4 3 or 4	
CS 43	6 Computer Networking Laboratory	3 or 4	CS 436	Computer Networking Laboratory	3 or 4	
CS 43 CS 43		3 or 4	CS 438 CS 439	Communication Networks Wireless Networks	3 or 4	
CS 44	Artificial Intelligence	3 or 4	CS 440	Artificial Intelligence	3 or 4	
CS 44		3 or 4	CS 445	Computational Photography	3 or 4 3 or 4	
CS 44 CS 44		3 or 4	CS 446 CS 447	Machine Learning Natural Language Processing	3 or 4	
CS 45		3 or 4	CS 450	Numerical Analysis	3 or 4	
CS 46 CS 46		3 or 4	CS 460 4 CS 461	Security Laboratory Computer Security I	3 or 4	4
CS 46	3 Computer Security II	3 or 4	CS 463	Computer Security II	3 or 4	
CS 46 CS 46		3 or 4	CS 465 CS 466	User Interface Design Introduction to Bioinformatics	3 or 4	
CS 46		3 or 4	CS 467	Social Visualization	3 or 4	
CS 47 CS 47		3 or 4	4 CS 473 CS 475	Algorithms Formal Models of Computation	3 or 4	4
CS 47	6 Program Verification	3 or 4	CS 476	Program Verification	3 or 4	
CS 47 CS 48		3 or 4	CS 477 CS 481	Formal Software Development Methods Advanced Topics in Stochastic Processes & Ap	3 or 4	
CS 48	4 Parallel Programming	3 or 4	CS 484	Parallel Programming	3 or 4	
CS 39	8 Special Topics (As Approved)	1 to 4 1 to 4	CS 398 CS 498	Special Topics (As Approved)	1 to 4 1 to 4	
ECE 2	97 Individual Study	1 10 4	1 ECE 297	Special Topics (As Approved) Individual Study	1 10 4	1
ECE 3			3 ECE 304	Photonic Devices		3
ECE 3			3 ECE 307 3 ECE 310	Techniques for Engrg Decisions Digital Signal Processing		3
ECE 3	11 Digital Signal Processing Lab		1 ECE 311	Digital Signal Processing Lab		1
ECE 3			1 ECE 314 3 ECE 329	Probability in Engineering Lab Fields and Waves I		1 3
ECE 3	30 Power Ckts & Electromechanics		3 ECE 330	Power Ckts & Electromechanics		3
ECE 3	33 Green Electric Energy		3 ECE 333 3 ECE 340	Green Electric Energy Semiconductor Electronics		3
ECE 3			3 ECE 342	Semiconductor Electronics Electronic Circuits		3
ECE 3			1 ECE 343	Electronic Circuits Laboratory		1
ECE 3			3 ECE 350 3 ECE 365	Fields and Waves II Data Science and Engineering		3
ECE 3		putati	4 ECE 374	Introduction to Algorithms & Models of Computa	at	4
ECE 3			3 ECE 380 4 ECE 391	Biomedical Imaging Computer Systems Engineering		3
ECE 3	95 Advanced Digital Projects Lab	2 or 3	ECE 395	Advanced Digital Projects Lab	2 or 3	-
ECE 3		1 to 4 0 to 4	ECE 396 ECE 397	Honors Project Individual Study in ECE	1 to 4 0 to 4	
ECE 4	02 Electronic Music Synthesis	0104	3 ECE 402	Electronic Music Synthesis	0104	3
ECE 4			3 ECE 403 4 ECE 408	Audio Engineering		3 4
ECE 4			4 ECE 408 4 ECE 411	Applied Parallel Programming Computer Organization & Design		4
ECE 4			3 ECE 412	Microcomputer Laboratory		3
ECE 4			3 ECE 414 2 ECE 415	Biomedical Instrumentation Biomedical Instrumentation Lab		3
ECE 4	16 Biosensors		3 ECE 416	Biosensors		3
ECE 4			4 ECE 417	Multimedia Signal Processing		4
ECE 4		3 or 4	4 ECE 418 ECE 419	Image & Video Processing Security Laboratory	3 or 4	4
ECE 4	20 Embedded DSP Laboratory		2 ECE 420	Embedded DSP Laboratory		2
ECE 4		3 or 4	4 ECE 422 ECE 424	Computer Security II	3 or 4	4
ECE 4	25 Intro to VLSI System Design		3 ECE 425	Intro to VLSI System Design	5014	3
ECE 4		3 or 4	ECE 428	Distributed Systems	3 or 4	4
ECE 4			4 ECE 431 3 ECE 432	Electric Machinery Advanced Electric Machinery		3
ECE 4		3 or 4	ECE 435	Computer Networking Laboratory	3 or 4	
ECE 4		3 or 4	3 ECE 437 ECE 438	Sensors and Instrumentation Communication Networks	3 or 4	3
ECE 4	39 Wireless Networks	3 or 4	ECE 439	Wireless Networks	3 or 4	
ECE 4			3 ECE 441 4 ECE 443	Physics & Modeling Semicond Dev LEDs and Solar Cells		3
ECE 4	44 IC Device Theory & Fabrication		4 ECE 444	IC Device Theory & Fabrication		4
ECE 4	45 Senior Design Project Lab		4 ECE 445	Senior Design Project Lab		4
ECE 4		trical	4 ECE 446 3 ECE 447	Principles of Experimental Research in Electric Active Microwave Ckt Design	al	4
ECE 4	48 Artificial Intelligence	3 or 4	ECE 448	Artificial Intelligence	3 or 4	
ECE 4			3 ECE 451 3 ECE 452	Adv Microwave Measurements Electromagnetic Fields		3
ECE 4	53 Wireless Communication Systems		4 ECE 453	Wireless Communication Systems		4
ECE 4	54 Antennas		3 ECE 454	Antennas		3
ECE 4		3 or 4	ECE 455 4 ECE 456	Optical Electronics Global Nav Satellite Systems	3 or 4	4
ECE 4	57 Microwave Devices & Circuits		3 ECE 457	Microwave Devices & Circuits		3
ECE 4			3 ECE 458 3 ECE 459	Applic of Radio Wave Propag Communications Systems		3
ECE 4	60 Optical Imaging		4 ECE 460	Optical Imaging		4
ECE 4			3 ECE 461	Digital Communications		3
ECE 4			3 ECE 462 2 ECE 463	Logic Synthesis Digital Communications Lab		3
ECE 4	63 Digital Communications Lab		2 EUE 463			
	64 Power Electronics		3 ECE 464	Power Electronics		3
ECE 4	64 Power Electronics 65 Optical Communications Systems		3 ECE 464 3 ECE 465	Power Electronics Optical Communications Systems		3
ECE 4 ECE 4	64 Power Electronics 65 Optical Communications Systems 66 Optical Communications Lab 67 Biophotonics		3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467	Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics		3 1 3
ECE 4 ECE 4 ECE 4	64 Power Electronics 65 Optical Communications Systems 66 Optical Communications Lab 67 Biophotonics 68 Optical Remote Sensing		3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467 3 ECE 468	Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing		3 1 3 3
ECE 4 ECE 4 ECE 4 ECE 4 ECE 4	64 Power Electronics 65 Optical Communications Systems 66 Optical Communications Lab 67 Bisophotonics 68 Optical Remote Sensing 69 Power Electronics Laboratory 70 Introduction to Robotics		3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467	Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics		3 1 3
ECE 4 ECE 4 ECE 4 ECE 4 ECE 4 ECE 4	64 Power Electronics 65 Optical Communications Systems 66 Optical Communications Lab 67 Bisphotonics 68 Optical Remote Sensing 69 Power Electronics Laboratory 70 Introduction to Robotics 72 Bismedical Ultrasound Imaging		3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467 3 ECE 468 2 ECE 469 4 ECE 470 3 ECE 472	Power Electronics Optical Communications Systems Optical Communications Lab Biophotonics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultrasound Imaging		3 1 3 3 2
ECE 4 ECE 4 ECE 4 ECE 4 ECE 4	64 Power Electronics 5 Optical Communications Systems 66 Optical Communications Lab 65 Optical Communications Lab 65 Optical Remote Sensing 69 Power Electronics Laboratory 1 Introduction to Robotics 72 Biomedical Ultrasound Imagina 73 Fund of Engry Acoustics	3 or 4	3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467 3 ECE 468 2 ECE 469 4 ECE 470	Power Electronics Optical Communications Systems Optical Communications Lab Biophobraics Optical Remote Sensing Power Electronics Laboratory Introduction to Robbids Biomedical Ultrasound Imaging Fund of Engly Acoustics	3 or 4	3 1 3 3 2 4
ECE 4 ECE 4 ECE 4 ECE 4 ECE 4 ECE 4 ECE 4 ECE 4	64 Power Electronics 5 Optical Communications Systems 65 Optical Communications Lab 65 Optical Communications Lab 65 Optical Communications Lab 66 Optical Communications Lab 67 Optical Remote Sensing 69 Power Electronics Laboratory 60 Power System Analysis 60 Power System Analysis 60 Power System Analysis 61 Formal Solvance Development Methods 63 Power Systems Development Methods 64 Power Systems Development Methods	3 or 4	3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467 3 ECE 468 2 ECE 469 4 ECE 470 3 ECE 473 5 ECE 473 6 ECE 478	Power Electronics Optical Communications Systems Optical Communications Sustems Optical Communications Biophotorics Optical Remote Sensing Power Electronics Laboratory Introduction is Notion Biomedical Ultrasound Imaging Fund of Engry Acoustics Power System Analysis Formal Software Development Methods	3 or 4	3 1 3 3 2 4 3
ECE 4	64 Power Electronics 55 Optical Communications Systems 65 Optical Communications Lab 65 Optical Communications Lab 65 Optical Communications 65 Optical Remote Sensing 65 Optical Remote Sensing 70 Introduction in Robotics 70 Introduction in Robotics 71 Elementical Unitersound Invaging 72 Fund of Errory Acoustics 73 Formal Software Development Methods 78 Formal Software Development Methods 78 Magnatic Resonance Insaging		3 ECE 464 3 ECE 465 1 ECE 466 3 ECE 467 3 ECE 468 2 ECE 469 4 ECE 470 3 ECE 473 5 ECE 473 6 ECE 474 6 ECE 478 6 ECE 480	Power Electronics Optical Communications Systems Optical Communications Lab Biophotorics Optical Remote Sensing Power Electronics Laboratory Introduction to Robotics Biomedical Ultracound Insuring Fund of Engry Acoustics Power System Analysis Formal Software Development Methods Magnetic Resonance Handing		3 1 3 3 2 4 3
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MATH 423 Differential Geometry
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MATH 424 Lore Park Variables
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Numerical Analysis
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Cells, Tissues & Development

Esp Techniqs in Cellular Biol

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Microbiology

Experimental Microbiology

Experimental Microbiology

Experimental Microbiology

Cenetics and Disease

Esp Techniqs in Cellular Biol

Microbiology

Cell & Membrane Physiology

Cell & Membrane Physiology

Cell & Membrane Physiology

Developmental Biology, Stem Cells and Regener

Endocrinology

Brain, Behavior & Info Process

Microbial Biochemistry

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Microbial Cenetics

Microbial Biochemistry

Esta-Model Microbiology

Microbial Cenetics

Microbial Biochemistry

Esta-Model Cell Signaling

Themodynamics

Fundamentals of Fluid Dynamics

Fundamentals of Fluid Dynamics
                        MATH 475
MATH 481
                MATH 482
MATH 484
MATH 487
        MATH 489
MCB 150
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                        MCB 301
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Mechanical Design 8 
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ME 451 ME 471	Computer Cntrl of Mech Systems Finite Element Analysis	3 or 4		ME 451 ME 471	Computer Critil of Mech Systems Finite Element Analysis	3 or 4	
ME 472	Introduction to Tribology	3 or 4		ME 472	Introduction to Tribology	3 or 4	
ME 485 MF 487	MEMS Devices & Systems MEMS-NEMS Theory & Fabrication			ME 485 ME 487	MEMS Devices & Systems MEMS-NEMS Theory & Fabrication		3
MUS 407	Elect Music Techniques I		3	MUS 407	Elect Music Techniques I		3
MUS 409	Elec Music Techniques II		2	MUS 409	Elec Music Techniques II		2
NEUR 453 NPRE 201	Cog Neuroscience of Vision Energy Systems	3 or 4 2 or 3		NEUR 453 NPRE 201	Cog Neuroscience of Vision Energy Systems	3 or 4 2 or 3	
NPRE 247	Modeling Nuclear Energy System		3	NPRE 247	Modeling Nuclear Energy System		3
NPRE 402 NPRE 412	Nuclear Power Engineering Nuclear Power Econ & Fuel Mgmt	3 or 4		NPRE 402 NPRE 412	Nuclear Power Engineering Nuclear Power Econ & Fuel Mgmt	3 or 4 3 or 4	
NPRE 412 NPRE 421	Plasma and Fusion Science	3 OF 4	3	NPRE 412 NPRE 421	Plasma and Fusion Science	3 OF 4	3
NPRE 423	Plasma Laboratory		2	NPRE 423	Plasma Laboratory		2
NPRE 429 NPRE 431	Plasma Engineering Materials in Nuclear Engrg			NPRE 429 NPRE 431	Plasma Engineering Materials in Nuclear Engrg		3
NPRE 432	Nuclear Engrg Materials Lab		2	NPRE 432	Nuclear Engrg Materials Lab		2
NPRE 435	Radiological Imaging		3	NPRE 435 NPRE 441	Radiological Imaging		3
NPRE 441 NPRE 442	Radiation Protection Radioactive Waste Management			NPRE 441	Radiation Protection Radioactive Waste Management		4
NPRE 444	Nuclear Analytical Methods Lab	2 or 3		NPRE 444	Nuclear Analytical Methods Lab	2 or 3	
NPRE 446 NPRE 447	Radiation Interact w/Matter I Radiation Interact w/Matter II			NPRE 446 NPRE 447	Radiation Interact w/Matter II Radiation Interact w/Matter II		3
NPRE 448	Nuclear Syst Engrg & Design			NPRE 448	Nuclear Syst Engrg & Design		4
NPRE 451	NPRE Laboratory			NPRE 451	NPRE Laboratory		3
NPRE 455 NPRE 457	Neutron Diffusion & Transport Safety Anlys Nucl Reactor Syst	3 or 4	4	NPRE 455 NPRE 457	Neutron Diffusion & Transport Safety Anlys Nucl Reactor Syst	3 or 4	4
NPRE 458	Design in NPRE	0 01 4		NPRE 458	Design in NPRE	0 01 4	4
NPRE 470 NPRE 475	Fuel Cells & Hydrogen Sources Wind Power Systems	3 or 4	3	NPRE 470 NPRE 475	Fuel Cells & Hydrogen Sources Wind Power Systems	3 or 4	3
PHYS 225	Relativity & Math Applications	3 OF 4	2	PHYS 225	Relativity & Math Applications	3 OF 4	2
PHYS 325	Classical Mechanics I			PHYS 325	Classical Mechanics I		3
PHYS 326 PHYS 401	Classical Mechanics II Classical Physics Lab			PHYS 326 PHYS 401	Classical Mechanics II Classical Physics Lab		3
PHYS 402	Light	3 or 4		PHYS 402	Light	3 or 4	
PHYS 403	Modern Experimental Physics	4 or 5		PHYS 403	Modern Experimental Physics	4 or 5	
PHYS 406 PHYS 419	Acoustical Physics of Music Space, Time, and Matter-ACP	3 or 4	4	PHYS 406 PHYS 419	Acoustical Physics of Music Space, Time, and Matter-ACP	3 or 4	4
PHYS 420	Space, Time, and Matter			PHYS 420	Space, Time, and Matter		2
PHYS 427	Thermal & Statistical Physics			PHYS 427 PHYS 460	Thermal & Statistical Physics Condensed Matter Physics		4
PHYS 460 PHYS 466	Condensed Matter Physics Atomic Scale Simulations	3 or 4	4	PHYS 460 PHYS 466	Condensed Matter Physics Atomic Scale Simulations	3 or 4	4
PHYS 470	Subatomic Physics			PHYS 470	Subatomic Physics		4
PHYS 485 PHYS 486	Atomic Phys & Quantum Theory Quantum Physics I			PHYS 485 PHYS 486	Atomic Phys & Quantum Theory Quantum Physics I		3
PHYS 487	Quantum Physics II			PHYS 487	Quantum Physics II		4
CUC 200	General Phonetics			PSYC 204	Intro to Brain and Cognition		3
SHS 200 SHS 240	Intro Sound & Hearing Science			SHS 200 SHS 240	General Phonetics Intro Sound & Hearing Science		3
SHS 300	Anat & Physiol Spch Mechanism		4	SHS 300	Anat & Physiol Spch Mechanism		4
SHS 301 SHS 320	General Speech Science Development of Spoken Language			SHS 301 SHS 320	General Speech Science Development of Spoken Language		4
SHS 450	Intro Audiol & Hear Disorders			SHS 450	Intro Audiol & Hear Disorders		4
SHS 470	Neural Bases Spch Lang		4	SHS 470	Neural Bases Spch Lang		4
STAT 420 STAT 424	Methods of Applied Statistics Analysis of Variance	3 or 4		STAT 420 STAT 424	Methods of Applied Statistics Analysis of Variance	3 or 4 3 or 4	
STAT 428	Statistical Computing	3 or 4		STAT 428	Statistical Computing	3 or 4	
STAT 429 STAT 440	Time Series Analysis Statistical Data Management	3 or 4		STAT 429 STAT 440	Time Series Analysis Statistical Data Management	3 or 4 3 or 4	
SE 411	Reliability Engineering	3 or 4		SE 411	Reliability Engineering	3 or 4	
SE 420	Digital Control Systems			SE 420	Digital Control Systems		4
SE 423 SE 424	Mechatronics State Space Design for Control			SE 423 SE 424	Mechatronics State Space Design for Control		3
TAM 211	Statics			TAM 211	Statics		3
TAM 212	Introductory Dynamics			TAM 212	Introductory Dynamics		3
TAM 251 TAM 324	Introductory Solid Mechanics Behavior of Materials			TAM 251 TAM 324	Introductory Solid Mechanics Behavior of Materials		3 4
TAM 335	Introductory Fluid Mechanics		4	TAM 335	Introductory Fluid Mechanics		4
TAM 412 TAM 435	Intermediate Dynamics Intermediate Fluid Mechanics			TAM 412	Intermediate Dynamics Intermediate Fluid Mechanics		4
TAM 445	Continuum Mechanics			TAM 445	Continuum Mechanics		4
TAM 451	Intermediate Solid Mechanics		4	TAM 451	Intermediate Solid Mechanics		4
ECE Courses	to include: rom the following list of Advanced Core ECE election			ECE Courses	to include: om the following list of Advanced Core ECE electi		
ECE 391	Computer Systems Engineering	es.		ECE 391	Computer Systems Engineering	ves.	
or CS 225	Data Structures			or CS 225	Data Structures		
ECE 310 ECE 330	Digital Signal Processing Power Ckts & Electromechanics			ECE 310 ECE 330	Digital Signal Processing Power Ckts & Electromechanics		
ECE 342	Electronic Circuits			ECE 342	Electronic Circuits		
ECE 350	Fields and Waves II CE labs identified below. At least one must be har	duran let		ECE 350	Fields and Waves II CE labs identified below. At least one must be ha	oluopa John	
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ECE 343	Electronic Circuits Laboratory			ECE 343	Electronic Circuits Laboratory		1
ECE 391 ECE 395	Computer Systems Engineering Advanced Digital Projects Lab	2 or 3	4	ECE 391 ECE 395	Computer Systems Engineering Advanced Digital Projects Lab	2 or 3	4
ECE 402	Electronic Music Synthesis			ECE 402	Electronic Music Synthesis		3
ECE 415 ECE 420	Biomedical Instrumentation Lab			ECE 415	Biomedical Instrumentation Lab		2
ECE 431	Embedded DSP Laboratory Electric Machinery			ECE 420 ECE 431	Embedded DSP Laboratory Electric Machinery		2
CS 436	Computer Networking Laboratory	3 or 4		CS 436	Computer Networking Laboratory	3 or 4	
ECE 437 ECE 438	Sensors and Instrumentation Communication Networks	3 or 4	3	ECE 437 ECE 438	Sensors and Instrumentation Communication Networks	3 or 4	3
ECE 439	Wireless Networks	3 or 4		ECE 439	Wireless Networks	3 or 4	
ECE 443 ECE 444	LEDs and Solar Cells IC Device Theory & Fabrication			ECE 443 ECE 444	LEDs and Solar Cells		4
ECE 444 ECE 446	IC Device Theory & Fabrication Principles of Experimental Research in Electrical				IC Device Theory & Fabrication Principles of Experimental Research in Electrical		4
ECE 447	Active Microwave Ckt Design		3	ECE 447	Active Microwave Ckt Design		3
ECE 451				ECE 451	Adv Microwave Measurements		3
ECE 453	Adv Microwave Measurements Wireless Communication Systems		- 4	ECE 453	Wireless Communication Systems		
ECE 453 ECE 456	Wireless Communication Systems Global Nav Satellite Systems		4		Wireless Communication Systems Global Nav Satellite Systems		4
ECE 453 ECE 456 ECE 460	Wireless Communication Systems Global Nav Satellite Systems Optical Imaging		4	ECE 456 ECE 460	Global Nav Satellite Systems Optical Imaging		4
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ECE 433 ECE 456 ECE 460 ECE 466 ECE 466 ECE 468 ECE 468 ECE 468 ECE 468 ECE 470 ECE 481 ECE 481 ECE 482 ECE 485 ECE 485 ECE 486 ECE 485 ECE 481 ECE 365 ECE 411 Electives Course List Code The Grainger Three electives	Wireless Communication Systems Global Nav Satisfies Systems Optical Imaging Diplial Communications Lab Optical Communications Lab Optical Communications Lab Optical Communications Lab Optical Emories Sensinia Power Electronics Laboratory Introduction to Electronics Nandechnology Control Systems Robot Dynamics and Control Photonic Device Laboratory Electronics Diplial Signar Photonicity Electronics Diplial Signar Photonicity Electronics Data Science and Engineering Computer Organization & Design Title College of Engineering Liberal Education course li		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ECE 456 ECE 463 ECE 466 ECE 469 ECE 469 ECE 470 ECE 486 ECE 489 ECE 489 ECE 481 ECE 485 Software Labs ECE 314 ECE 314 ECE 314 ECE 316 ECE 411 ECE 314 ECE 316 ECE 411 ECE 317 ECE 318 ECE 411 ECE 314 ECE 316 ECE 411 ECE 316	Global Nav Satellite Systems Optical hangin Digital Communications Lab Optical Communications Lab Optical Communications Lab Optical Remote Sensina Power Electronics Laboratory Introduction International Interna		4 2 1 3 2 4 4 4 4 3 1 1 3 4

- 1 External transfer students take ENG 300 Instead.
 2 MATH 220 may be substituted, with four of the five c 7 Freshmen take ECE 110 for 3 credit hours, Lab-only version 4 STAT 410 may be substituted.
 5 ECE 496 AND ECE 499 may be substituted.
 5 ECE 496 AND ECE 499 may be substituted.
 6 Advanced Composition may be satisfied by completing ECI 7 The Grainger College of Engineering approved liberal educ.
 7 The Grainger College of Engineering restrictions to free ele

- External transfer students take ENG 300 instead.

 MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

 Freshmen take ECE 110 for 3 credit hours: Lab-only version taken by transfer students (with special permission) is 1 credit hour.

 STAT 410 may be substituted.

 SECE 496 AND ECE 499 may be substituted.

 Advanced Composition may be satisfied by completing ECE 445, or a course in either the general education or free elective categories which has the Advanced Composition designation.

 Advanced Composition may prove be liberal deciration course list can be found here. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.



MATHEMATICS

College of Liberal Arts & Sciences 273 Altgeld Hall, MC-382 1409 W. Green Street Urbana, IL 61801 USA

February 22, 2021

Erhan Kudeki
Professor and Associate Head for Undergraduate Affairs
Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign

Dear Professor Kudeki,

Our department acknowledges and supports the proposed revision of the Electrical Engineering (EE) and Computer Engineering (CE) BS programs, to adopt MATH 257 as a required course for EE and CE majors to be taken after MATH 220/221 and before MATH 285, and to replace MATH 286 with MATH 285. The Department of Mathematics is prepared to accommodate the enrollment shifts among courses which will result from these changes.

In the event that this curricular revision is approved, the Mathematics Department will remove the phrase "Computer Engineering or Electrical Engineering" from the following statement in Course Explorer regarding MATH 285 (which can be found at https://courses.illinois.edu/schedule/2021/spring/MATH/285):

"not intended for Computer Engineering or Electrical Engineering or Math & CS major(s)."

Sincerely,

Jeremy Tyson

Professor and Chair

Department of Mathematics

University of Illinois at Urbana-Champaign



COLLEGE OF LIBERAL ARTS & SCIENCES

Department of Atmospheric Sciences 3070 Natural History Building, MC-104 1301 W. Green St. Urbana, IL 61801-3070

March 15, 2021

Dear Professor Kudeki,

The Department of Atmospheric Sciences approves listing the class ATMS 201 (General Physical Meteorology) as Technical Elective for Electrical Engineering and Computer Engineering majors.

Sincerely,

Nicole Riemer

Professor and Associate Head

Department of Atmospheric Sciences

Vicole Riemer

On Mar 18, 2021, at 11:14 AM, Aber, Mark S <maber@illinois.edu> wrote:

Dear Erhan,

We are happy to support ECE by welcoming your students into PSYC 204. Best of luck with your curriculum revision.

best, Mark

From: Kudeki, Erhan < erhan@illinois.edu > Sent: Thursday, March 11, 2021 4:45 PM
To: Aber, Mark S < maber@illinois.edu >

Cc: Kudeki, Erhan < erhan@illinois.edu >; Newell, Brooke < bsnewell@illinois.edu >

Subject: Support letter request

Dear Mark.

I am writing to let you know that ECE has decided to add PSYC 204, Intro to Brain and Cognition, to its list of Technical Electives applicable to Electrical Engineering and Computer Engineering majors in our undergraduate program.

We have been asked by the College of Engineering to seek a letter of support from Psychology for this change as our curriculum revision proposal, approved by the College Executive Committee, goes up to the University Senate. Please provide us with such a letter of support. I'll be happy to answer any questions you may have about our request.

Thanks and best regards,

Erhan

Erhan Kudeki 2172650128 | erhan@illinois.edu Professor and Associate Head for Undergraduate Affairs Electrical and Computer Engineering, The Grainger College of Engineering 2080 ECE Building, 306 North Wright Street, Urbana, IL 61801

On Mar 18, 2021, at 2:52 PM, Rayburn, A Lane arayburn@illinois.edu wrote:

Hi Erhan

Crop Sciences supports adding CPSC 265 to the list of technical electives in ECE.

Just let me know if you need anything else.

Sincerely,

Lane

Dr. A. Lane Rayburn
Professor of Cytogenetics
Director of Undergraduate Studies
Department of Crop Sciences
University of Illinois
AE-120 Turner Hall
1102 S. Goodwin Ave
Urbana, IL 61801
Telephone - 217 333-4374.
http:// https://cropsciences.illinois.edu/people/profile/arayburn

From: Kudeki, Erhan < erhan@illinois.edu Sent: Thursday, March 18, 2021 10:47 AM

To: Tranel, Patrick J tranel@illinois.edu; Rayburn, A Lane arayburn@illinois.edu>

Cc: Kudeki, Erhan < <u>erhan@illinois.edu</u>> **Subject:** Re: Support letter request

Thanks Pat, I'm ashamed of my cut and paste error :-)

Lane, we will be needing the crop sciences support letter. We will be adding CPSC 265 to our very broad list of Technical Electives in ECE. Let me know if you have any questions.

Regards,

Erhan

Erhan Kudeki 2172650128 | erhan@illinois.edu Professor and Associate Head for Undergraduate Affairs Electrical and Computer Engineering, The Grainger College of Engineering 2080 ECE Building, 306 North Wright Street, Urbana, IL 61801

<image001.png>

On Mar 18, 2021, at 9:23 AM, Tranel, Patrick J < tranel@illinois.edu > wrote:

Erhan,

Sorry. I scanned your email before and deleted it because this is out of my jurisdiction, and because your email stated you needed a letter from atmospheric sciences, not crop sciences. After a closer read, I've passed your email on to our teaching coordinator, Lane Rayburn, who handles these.

Pat

PATRICK J TRANEL

Ainsworth Professor and Associate Head

University of Illinois at Urbana-Champaign College of Agricultural, Consumer and Environmental Sciences **Department of Crop Sciences 320 ERML** 1201 W Gregory Dr | M/C 051 Urbana, IL 61801 217.333.1531 | tranel@illinois.edu cropsciences.illinois.edu

<image001.png>

Under the Illinois Freedom of Information Act any written communication to or from university employees regarding university business is a public record and may be subject to public disclosure.

From: "Kudeki, Erhan" < erhan@illinois.edu> Date: Thursday, March 18, 2021 at 9:03 AM

To: Patrick Tranel < <u>tranel@illinois.edu</u>>

Cc: "Kudeki, Erhan" < erhan@illinois.edu>, "Newell, Brooke" < bsnewell@illinois.edu>

Subject: Re: Support letter request

Hi Patrick, a gentle reminder, thx,

Erhan

Erhan Kudeki 2172650128 | erhan@illinois.edu Professor and Associate Head for Undergraduate Affairs Electrical and Computer Engineering, The Grainger College of Engineering 2080 ECE Building, 306 North Wright Street, Urbana, IL 61801

On Mar 11, 2021, at 4:45 PM, Kudeki, Erhan < erhan@illinois.edu > wrote:

Dear Patrick,

I am writing to let you know that ECE has decided to add CPSC 265, Genetic Engineering Lab, to its list of Technical Electives applicable to Electrical Engineering and Computer Engineering majors in our undergraduate program.

We have been asked by the College of Engineering to seek a letter of support from Atmospheric Sciences for this change as our curriculum revision proposal, approved by the College Executive Committee, goes up to the University Senate. Please provide us with such a letter of support. I'll be happy to answer any questions you may have about our request.

Thanks and best regards,

Erhan

Erhan Kudeki

2172650128 | erhan@illinois.edu

Professor and Associate Head for Undergraduate Affairs

Electrical and Computer Engineering, The Grainger College of Engineering
2080 ECE Building, 306 North Wright Street, Urbana, IL 61801

UNIVERSITY OF ILLINOIS

Urbana-Champaign • Chicago • Springfield

University Senates Conference 378 Henry Administration Building 506 South Wright Street Urbana, IL 61801

February 26, 2020

Kathy Martensen Assistant Provost for Educational Programs 206 Swanlund, MC-304

Dear Kathy:

At its meeting on February 20, the University Senates Conference approved the proposed classification of minutes of the Urbana-Champaign Senate meeting of February 10. The Class I items are listed below.

EP.19.69	Establish a Major in Translational Medical Sciences in the Carle Illinois College of Medicine for the Degree of Master of Science
EP.20.34	Establish a Minor in Disability Studies in the Department of Kinesiology and Community Health, College of Applied Health Sciences
EP.20.44	Eliminate the BS MS in Industrial Engineering
EP.20.45	Eliminate the BS MS in Mechanical Engineering
EP.20.46	Revision of Curriculum Requirements for the Ph.D. in Civil Engineering to Add a 96-Credit Hour Option
EP.20.47	Revision of Curriculum Requirements for the Ph.D. in Environmental Engineering to Add a 96-Credit Hour Option
EP.20.48	Revision to the Master of Accounting Science (MAS) Degree Course Requirements
EP.20.49	Revision to Taxation Concentration. Revision to the Master of Accounting Science (MAS) Degree Course Requirements
EP.20.50	Revision to the Data Analytics Concentration. Revision to the Master of Accounting Science (MAS) Degree Course Requirements
EP.20.51	Financial Reporting & Assurance Concentration. Revision to the Master of Accounting Science (MAS) Degree Course Requirements

EP.20.52	Establish Joint Program in the Department of Animal Sciences for the BS/MANSC
EP.20.53	Establish a Joint BS (CS+ANSC)/MANSC Program in the Department of Animal Sciences
EP.20.54	Revise the BALAS in Classics, College of Liberal Arts and Sciences, to Eliminate the Five Ways Students Can Choose a Classics Major (Major in Classics (Without a Concentration) and the Four Concentrations in Greek, Latin, Classics, Classical Civilization, and Classical Archeology. Add Concentrations in Classical Languages and Classical Civilizations as the Only Two Options Students May Pursue a Classics Major
EP.20.55	Revise the BALAS in Classics, College of Liberal Arts and Sciences, Classical Archeology
EP.20.56	Revise the BALAS in Classics, College of Liberal Arts and Sciences, Classical Civilization
EP.20.57	Elimination of the Undergraduate Minor: Classical Archaeology. In Conjunction with the Elimination of Three Other Undergraduate Minors in the Department of Classics: Classical Civilization, Greek, Latin; and the Creation of Two Minors: Classical Civilizations and Classical Languages
EP.20.58	Elimination of the Undergraduate Minor: Greek Minor
EP.20.59	Elimination of the Undergraduate Minor: Classical Civilization
EP.20.60	Elimination of the Undergraduate Minor: Latin Minor
EP.20.61	Creation of a new Undergraduate Minor: Classical Civilizations
EP.20.62	Creation of a new Undergraduate Minor: Classical Languages
EP.20.63	Revise the BALAS in Classics, Classical Civilizations
EP.20.64	Revise the BALAS in Classics, Classical Languages
EP.20.65	Revising EdD Degree Program Course and Exam Requirement
EP.20.66	Revise the Minor in German, Department of Germanic Languages and Literatures
EP.20.67	Revise the BALAS in Classics
EP.20.68	Revise the BALAS in Classics: Latin

EP.20.69	Establish a New Master of Science (M.S.) in Mental Health Counseling in the Department of Educational Psychology, College of Education
EP.20.70	Proposal to Establish a New Bachelor of Science Degree with a Major in Plant Biotechnology (B.S. in Plant Biotech) in the Department of Crop Sciences, College of Agricultural, Consumer and Environmental Sciences
EP.20.71	Revision to the Chemistry Minor
EP.20.72	Urban Studies & Planning: Social Justice
EP.20.75	Remove Art History PhD, Art Education PhD, and Education Policy, Organization, and Leadership MA, EdM, and CAS from a List of Programs Participating in the Writing Studies Floating Concentration
EP.20.76	Create a new Minor in German Business and Commercial Studies
EP.20.77	Computer Science & Philosophy, BSLAS (Revisions to the BSLAS in Computer Science & Philosophy, Department of Philosophy)
EP.20.78	Computer Science Minor
EP.20.79	New Proposal for BFA in Theatre: Arts & Entertainment Technology
EP.20.80	Revising Requirements for BFA in Theatre: Scenic Design
EP.20.81	Revising Requirements for BFA in Theatre: Sound Design & Technology
EP.20.82	Revising Requirements for BFA in Theatre: Lighting Design & Technology
EP.20.83	Revising Requirements for BFA in Theatre: Scenic Technology
EP.20.84	Revising Requirements for BFA in Theatre: Costume Design & Technology
EP.20.85	Revising Requirements for BFA in Theatre: Acting
EP.20.86	Revising Requirements for BFA in Theatre
EP.20.87	Revising Requirements for BFA in Theatre: Theatre Studies
EP.20.88	Revising Requirements for BFA in Theatre: Stage Management
EP.20.89	Revising Requirements in Theatre Minor, UG

EP.20.90	Computer Science & Astronomy, BSLAS (Revise the BSLAS in Computer Science & Astronomy, College of Liberal Arts and Sciences)
EP.20.91	Revising Requirements for BS in Civil Engineering
EP.20.92	Revising Requirements for BS in Computer Engineering
EP.20.93	Revising Requirements for BSAG in Agricultural and Biological Engineering
EP.20.94	Revising Requirements for BS in Agricultural and Biological Engineering
EP.20.95	Revising Requirements for BS in Agricultural & Biological Engineering: Agricultural Engineering
EP.20.96	Revising Requirements for BS in Agricultural & Biological Engineering: Biological Engineering
EP.20.97	Revising Requirements for BS in Computer Science
EP.20.98	Revising Requirements for BS in Electrical Engineering
EP.20.99	Revising Requirements for BS in Engineering Mechanics
EP.20.100	Revising Requirements for BS in Engineering Physics
EP.20.101	Revising Requirements for BS in Systems Engineering & Design
EP.20.102	Revising Requirements for BS in Nuclear, Plasma, and Radiological Engineering
EP.20.103	Revising Requirements for BS in Mechanical Engineering
EP.20.104	Revising Requirements for BS in Materials Science & Engineering
SP.20.09	Proposed Revision to the <i>Constitution</i> , Article II, Section 1.b; Article III, Section 1; and Article IV, Section 1 Sincerely,

0.

Connie Sailor Administrative Aide

c: Ellen Foran, Renee Nagy Julian Parrott Jenny Roether Nathan Wilds

1200: ELECTRICAL & COMPUTER ENGINEERING MINOR, UG

Completed Workflow

1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)

Approval Path

1. Fri, 13 Sep 2019 13:48:18 GMT Deb Forgacs (dforgacs): Approved for U Program Review

History

1. Sep 13, 2019 by Brooke Newell (bsnewell)

Date Submitted: Tue, 21 Sep 2021 16:12:28 GMT

Viewing:1200: Electrical & Computer Engineering Minor, UG

Changes proposed by: Brooke Newell

Proposal Type:

Minor (ex. European Union Studies)

This proposal is for a:

Revision

Administration Details

Official Program Name

Electrical & Computer Engineering Minor, UG

Sponsor College

Grainger College of Engineering

Sponsor Department

Electrical and Computer Engineering

Sponsor Name

Erhan Kudeki

Sponsor Email

erhan@illinois.edu

College Contact

Brooke Newell

College Contact Email
bsnewell@illinois.edu
Does this program have inter-departmental administration?
No .
D. LT'd
Proposal Title
Effective Catalog Term
Fall 2021
Provide a brief, concise description (not justification) of your proposal.
Administrative approval: Replacing CS 125 with CS 124, and providing clarity in the EE and CompE Options regarding credit hour totals.
Program Justification
riogiam sustincation
Why are these changes necessary?
CS 125 is being discontinued and the EE and CompE Option credit hour totals weren't clear for each option.
Instructional Resources
Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed
change?
No
Does the program include other courses/subjects impacted by the creation/revision of this program?
No
Dragram Dagulatian and Accessment
Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

This is tied to ECE ABET process.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

An undergraduate minor should consist of at least 16 - and no more than 21 hours - of course work, with at least 6 hours of 300- or 400- level courses. Except clearly remedial offerings, prerequisite courses within the sponsoring unit count towards the total; prerequisite courses outside the sponoring unit do not count toward this total. The unit sponsoring the minor and that unit's college may set educationally necessary prerequisites for eligibility for the minor within these constraints. Does this proposal meet these criteria?

Yes

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs

ECE Minor UG_Minor Revision_Side by Side Table.xlsx

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text - Overview Tab

Statement for Programs of Study Catalog

Code	Title	Hours
Circuits Requirement:		3
Select one of the following:		
ECE 110	Introduction to Electronics	3
ECE 205	Electrical and Electronic Circuits	3
Programming Requirement: ¹		0-3
Select one of the following (with no	particular preference):	3-4
Select one of the following (with no	particular preference) unlessECE 220is taken:	
CS 101	Intro Computing: Engrg & Sci	3
CS 125	Introduction to Computer Science	
CS 124	Introduction to Computer Science I	3
A probability or statistics course ch	osen from an approved list below:	3-4
ECE 313	Probability with Engrg Applic	3
IE 300	Analysis of Data	3
BIOE 310	Comp Tools Bio Data	3
MATH 461	Probability Theory	3 or 4
MATH 463	Statistics and Probability I	4
CEE 202	Engineering Risk & Uncertainty	3
CS 361	Probability & Statistics for Computer Science	3
Select one of the following options	below. Both the Core and Advanced Core courses from Option A or B must be completed	
A. Electrical Engineering Option		
A. Electrical Engineering Option		10-11

Core requirement:		
ECE 210	Analog Signal Processing	4
Advanced Core Electives:		
Two ECE courses chosen from a	an approved list below:	
ECE 310	Digital Signal Processing	3
ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	4
& ECE 343	and Electronic Circuits Laboratory	
B. Computing Engineering Optio	on	
B. Computing Engineering Option		15-16
Core Requirement:		
ECE 120	Introduction to Computing	4
ECE 220	Computer Systems & Programming	4
Advanced Core Electives:		
Two ECE courses chosen from a	an approved list below:	
ECE 385	Digital Systems Laboratory	3
ECE 391	Computer Systems Engineering	4
ECE 411	Computer Organization & Design	4
Elective ECE Courses to achieve a	minimum of 18 hours of ECE course work. ²	0-5

If the student will be takingECE 220followingECE 120, this requirement will be waived.

Program Features

Academic Level

Undergraduate

Is this minor?

A Comprehensive study in a single discipline

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Other than certification via the students' degree audits, is there any additional planned mechanism to award/honor successful completion of the minor?

No

Completion of the minor requires a minimum of 18 hours ECE course work. No additional hours are needed in this category if all courses taken to satisfy the previous requirements are ECE courses. Otherwise choose from any 300 and 400 level classes exceptECE 316,ECE 317,ECE 396,ECE 397,ECE 496,ECE 499.

Delivery Method

Tochnology

1200

recnnology
Will the program need additional technology beyond what is currently available for the unit? No
Non-Technical Resources
Will the program require additional supplies, services or equipment (non-technical)? No
Resources
For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.
Library Resources
Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.
No impact
EP Documentation
EP Control Number
EP.22.030
This proposal requires HLC inquiry
No
DMI Documentation
Banner/Codebook Name
Electrical & Computer Engineering
Program Code:

Minor Code

1200

Program Reviewer Comments

Deb Forgacs (dforgacs) (Fri, 17 Sep 2021 14:27:45 GMT):Rollback: minimum total credit hours.

Brooke Newell (bsnewell) (Mon, 20 Sep 2021 16:22:14 GMT):Rollback: Per email.

Deb Forgacs (dforgacs) (Mon, 27 Sep 2021 14:22:37 GMT):Re-entered the proposal type, minor type "is this minor", program feature 09/27/2021

Kathy Martensen (kmartens) (Wed, 06 Oct 2021 16:52:36 GMT):Administrative approval: Doesn't change total required hours; doesn't restrict students' options.

Key: 124



Current Program of Study

Circuits Requirement:		4
Select one of the following:		3
ECE 110	Introduction to Electronics	3
ECE 205	Electrical and Electronic Circuits	3
ECE 203		
Programming Requirement: 1	<u> </u>	3-4
Select one of the following (with no pa		3-4
CS 101 CS 125	Intro Computing: Engrg & Sci Introduction to Computer Science	4
CJ 11.3	and didection to computer occurre.	
A probability or statistics course choses	- form or a second first below	
		3-4
ECE 313 IE 300	Probability with Engrg Applic Analysis of Data	3
IE 300 BIOE 310		3
MATH 461	Comp Tools Bio Data Probability Theory	3 3 or 4
MATH 463	Statistics and Probability I	4
WIATH 403	Engineering Risk & Uncertainty	3
CEE 202		3
CS 361	Probability & Statistics for Computer Science	3
Select one of the following options beli	ow. Both the Core and Advanced Core courses from	
Option A or B must be completed		9-11
A. Electrical Engineering Option		
Core requirement:		
ECE 210	Analog Signal Processing	4
Advanced Core Electives:	and the ball	
Two ECE courses chosen from an ECE 310	Digital Signal Processing	3
ECE 329		
ECE 329	Fields and Waves I	3
ECE 330	Power Ckts & Electromechanics	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	3
& ECE 343	and Electronic Circuits Laboratory	3
B. Computing Engineering Option		
Core Requirement:		
ECE 120	Introduction to Computing	4
	Computer Systems & Programming	4
ECE 220 Advanced Core Electives:		
Two ECE courses chosen from an	approved list below:	
ECE 385	Digital Systems Laboratory	3
	Computer Systems Engineering	4
ECE 391		4
ECE 411	Computer Organization & Design	
Elective ECE Courses to achieve a minir	num of 18 hours of ECE course work.	0-5
	If the student will be taking ECE 220	
	following ECE 120, this requirement will be waived.	
	wurvea.	
	2	
	C	
	Completion of the minor requires a minimum of 18 hours ECE course work.	
	No additional hours are needed in this	
	category if all courses taken to satisfy the	
	previous requirements are ECE courses.	
	Otherwise choose from any 300 and 400 level classes except ECE 316, ECE 317,	
	Otherwise choose from any 300 and 400	
	Otherwise choose from any 300 and 400 level classes except ECE 316, ECE 317,	

New Program of Study

		3
Select one of the following:		
ECE 110	Introduction to Electronics	3
ECE 205	Electrical and Electronic Circuits	3
Programming Requirement: 1		0-3
Select one of the following (with no par taken:	ticular preference) unless ECE 220 is	
CS 101	Intro Computing: Engrg & Sci	3
CS 124	Introduction to Computer Science	3
A probability or statistics course chosen	from an approved list below:	3-4
ECE 313	Probability with Engrg Applic	3
IE 300	Analysis of Data	3
BIOE 310	Comp Tools Bio Data	3
MATH 461	Probability Theory	3 or 4
MATH 463	Statistics and Probability I	4
		3
CEE 202	Engineering Risk & Uncertainty	3
	Probability & Statistics for	3
CS 361	Computer Science	3
Select one of the following options belo courses from Option A or B must be cor		
A. Electrical Engineering Option		10-11
Core requirement:		10-11
	Apples Canal Preserving	4
ECE 210 Advanced Core Electives:	Analog Signal Processing	*
Two ECE courses chosen from an	approved list helow:	-
ECE 310	Digital Signal Processing	3
ECE 329	Fields and Waves I	3
EUE 349		
ECE 330	Power Ckts & Electromechanics	3
ECE 340	Semiconductor Electronics	3
ECE 342	Electronic Circuits	_
LUL STE	Executionic Circuits	
		4
& FCF 343	and Electronic Circuits Laboratory	4
	and Electronic Circuits Laboratory	4 15-16
B. Computing Engineering Option	and Electronic Circuits Laboratory	7
B. Computing Engineering Option Core Requirement:		7
B. Computing Engineering Option Core Requirement:	Introduction to Computing	15-16
B. Computing Engineering Option Core Requirement: ECE 120		15-16
	Introduction to Computing Computer Systems &	15-16
B. Computing Engineering Option Core Requirement: ECE 120	Introduction to Computing Computer Systems & Programming	15-16
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE courses chosen from an	Introduction to Computing Computer Systems & Programming approved list below:	15-16
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE courses chosen from an	Introduction to Computing Computer Systems & Programming approved list below: Digital Systems Laboratory	15-16 4 4
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE courses chosen from an ECE 385	Introduction to Computing Computer Systems & Programming approved list below:	15-16 4 4
B. Computing Engineering Option Core Requirement: ECE 120 Advanced Core Electives: Two ECE courses chosen from an ECE 391	Introduction to Computing Computer Systems & Programming approved list below: Digital Systems Laboratory	15-16 4 4
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE Courses chosen from an. ECE 385 ECE 391 ECE 411	Introduction to Computing Computer Systems & Programming Programming Digital Systems Laboratory Computer Systems Engineering Computer Organization & Design	15-16 4 4 3 4
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE Courses chosen from an. ECE 385 ECE 391 ECE 411	Introduction to Computing Computer Systems & Priorgamming approved list below: Digital Systems aboratory Computer Systems Engineering Computer Organization & Design um of 18 hours of ECE course work. ²	15-16 4 4 3 4
B. Computing Engineering Option Core Requirement: ECE 120 ECE 220 Advanced Core Electives: Two ECE Courses chosen from an. ECE 385 ECE 391 ECE 411	Introduction to Computing Computer Systems & Programming Approved list below: Computer Systems Laboratory Computer Systems Engineering Computer Organization & Design Une of 18 hours of ECE Course work - If the student will be taking	15-16 4 4 3 4
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Note: Please check DARS code to make sure this is only by approval (right now the new DARS automatically count it as tech elec

APPROVED BY SENATE 9/12/2011

Office of the Provost and Vice Chancellor for Academic Affairs

Swanlund Administration Building 601 East John Street Champaign, IL 61820



August 23, 2011

Gay Miller, Chair Senate Committee on Educational Policy Office of the Senate 228 English Building, MC-461

Dear Professor Miller:

Enclosed is a copy of a proposal from the College of Engineering to establish the undergraduate minor in Electrical and Computer Engineering.

This proposal has been approved by the College of Engineering's Executive Committee. It now requires Senate review.

Sincerely,

Kristi A. Kuntz Assistant Provost

KAK/njh

Enclosures

c: A. Cangellaris

Kush & Kunts

- J. Erickson
- B. Heuser
- S. Kamin
- E. Kudeki
- E. Stovall
- J. Hanks

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

College of Engineering

Executive Committee 306 Engineering Hall, MC-266 1308 West Green Street Urbana, IL 61801



May 19, 2011

Kristi Kuntz Assistant Provost 217 Swanlund Administration Building MC-304

Via: Ilesanmi Adesida, Engineering College

Dear Ms. Kuntz:

The College of Engineering Executive Committee has reviewed and approved the following:

New Program: "Undergraduate Minor in Electrical and Computer Engineering"

Attached is a copy of the request.

Sincerely yours,

Brent J. Heuser, Secretary Executive Committee

But I Henry

Approval Recommended:

Ilesanmi Adesida, Dean

College of Engineering

BJH/jmh

Enclosure

c: Andreas Cangellaris
Jeff Erickson
Sam Kamin
Erhan Kudeki
Michael Pleck
Elizabeth Stovall
Jean Hanks



Senate Educational Policy Committee Proposal Check Sheet

PROPOSAL TITLE (Same as on proposal): Establishment of a New Undergraduate Minor in Electrical and Computer Engineering in the Department of Electrical and Computer Engineering, College of Engineering

PRO	POSAL TYPE (Please select all that apply below):
A. [Program and degree proposals
1.	This proposal is for a graduate program or degree
	☐ Yes No
2.	Degree proposal (e.g. B.S.A.E., M.S.C.E.)
	New degree — please name the new degree:
	Revision of an existing degree — please name the existing degree to be revised:
3.	Major proposal (disciplinary focus, e.g., Mathematics)
	New major — please name the new major:
	Revision of an existing major — please name the existing major to be revised:
4.	Concentration proposal (e.g. Financial Planning)
	New concentration — please name the new concentration:
	Revision of an existing concentration — please name the existing concentration to be revised:
5.	Minor proposal (e.g. Cinema Studies)
	New minor — please name the new minor: <u>Electrical and Computer Engineering</u>
	Revision of an existing minor — please name the existing minor to be revised:

	6.	Proposal for renaming an existing degree, major, concentration, or minor
		degree concentration minor
		Please provide the current name:
		Please provide the proposed new name:
	7.	Proposal for terminating an existing degree, major, concentration, or minor
		Please name the existing degree, major, concentration, or minor:
	8.	Proposal for a multi-institutional degree between Illinois (UIUC) and a foreign institution
		Please name the existing Illinois degree or program:
		Please name the partnering institution:
В.		Proposal for renaming existing academic units (college, school, department, or program)
		Please provide the unit's current name:
		Please provide the unit's proposed new name:
C.		Proposal for reorganizing existing units (colleges, schools, departments, or programs)
		Change in status of an existing and approved unit (e.g. change from a program to department) — please indicate current unit name including status:
		☐ Transfer an existing unit
		Please provide the current unit's name and home:
		Please provide the new home for the unit:
		Merge two or more existing units (e.g., merge department A with department B)
		Please provide the name and college of unit one to be merged:
		Please provide the name and college of unit two to be merged:
		Terminate an existing unit — please provide the current unit's name and status:
D.		Other educational policy proposals (e.g., academic calendar, grading policies, etc.)
		Please indicate the nature of the proposal:
C	, .	. 21 2000
Sep	temt	per 21, 2009 version



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Establishment of a New Undergraduate Minor in Electrical and Computer Engineering in the Department of Electrical and Computer Engineering, College of Engineering

SPONSOR: Erhan Kudeki, Professor of Electrical and Computer Engineering and Associate Head for Undergraduate Affairs, 265-0128, erhan@illinois.edu.

COLLEGE CONTACT: Charles Tucker, III, Associate Dean for Undergraduate Programs, 333-2280, ctucker@illinois.edu

BRIEF DESCRIPTION: The Electrical and Computer Engineering (ECE) Minor will provide a choice between exposure to the electrical engineering (EE) and computer engineering (CE) disciplines. Students in the ECE Minor will take a common set of required courses in Circuits, Programming, and Probability or Statistics. Depth in the ECE Minor will be established via an advanced core requirement and an advanced elective requirement in EE or CE.

JUSTIFICATION: The ECE Minor will be open to all UIUC undergraduates outside the ECE Department with the exception that Computer Science majors cannot elect the Computer Engineering Option within the Minor. The aim of the ECE Minor is to expose engineering students outside of ECE, as well as undergraduates in sciences and or mathematics, to methodologies and applications of focus in electrical and computer engineering disciplines. Engineering students outside of ECE would benefit from a knowledge and understanding of electrical and computer engineering principles that can be applied to interdisciplinary work in the areas of computation, system and product design, signal processing, and optimization. Students outside of engineering would benefit from instruction in engineering as a framework for analytical problem solving. For example, it has been said for many years that students in the life sciences would benefit from a minor in engineering to prepare them for careers in bioengineering which is engineering applied to biological applications and processes. Students in engineering disciplines such as chemical and biomolecular engineering would benefit from this minor as many of the applications in this discipline are computationally oriented.

REQUIREMENTS AND RELATED INFORMATION:

Course Requirements

- 1. Circuits (4 hours): ECE 110—Intro Elec & Computer Engrg; or ECE 205—Elec & Electronic Circuits and ECE 206—Elec & Electronic Circuits Lab
- 2. Programming (3-4 hours): one of (with no particular preference) CS 101—Intro Computing: Engrg & Sci, CS 125—Intro to Computer Science, or ECE 190—Intro to Computing Systems
- 3. Probability or Statistics (3-4 hours): one course from an approved list (see Appendix A.1)
- 4. Option:
 - a. EE Option (10-11 hours):
 - 1) EE Core Requirement: ECE 210—Analog Signal Processing (4 hours)
 - 2) EE Advanced Electives: two courses (300 level or above) from an approved list (6-7 hours, see Appendix A.2)
 - -Or-
 - b. CE Option (9-11 hours):
 - 1) CE Core Requirement: ECE 290—Computer Engineering I (3 hours) or CS 231—Computer Architecture I (3 hours). ECE 290 should be taken unless CS 231 credit exists
 - 2) CE Advanced Electives: two courses (300 level or above) from an approved list (6-8 hours, see Appendix A.3)
- 5. Additional ECE Course Work (0-5 hours): Elective ECE-rubric courses to attain 18 total hours of ECE-rubric credit. No additional hours are needed in this category if all courses taken to satisfy Requirements 1-4 are ECE-rubric ones.

Accordingly, the number of credit hours required to complete the ECE Minor ranges from 19-23 hours if no additional ECE-rubric course work (Requirement 5) is needed, and up to 28 if it is.

Prerequisites for the Minor: None, other than credit in basic science and mathematics courses required as standard prerequisites for the courses to be taken under the program.

Admission to the Minor: Students with B- or better grades in ECE 110 or ECE 205 will be formally accepted to the program upon application.

Minor Advisor: ECE Advisors in the ECE Undergraduate Advising Office in 156 Everitt will be responsible for advising the students enrolled in the program.

Certification of Successful Completion: The requirements will be coded into and verified via DARS, and then verified by the CoE as the other minors are.

BUDGETARY AND STAFF IMPLICATIONS:

- a. Additional staff and dollars needed: None.
- b. Internal reallocations (e.g. change in class size, teaching loads, student-faculty ratio, etc.): Minimal. Enrollment in the minor is projected to be about 20 students per year.

That's a negligible fraction of the approximately 800 and 550 students enrolled in ECE 110 and ECE 205/206 annually. Furthermore, ECE 110 and ECE 205/206 are already handling many non-ECE students, the pool that we will draw from for the new ECE minor. Similarly, the core EE and CE Option courses, ECE 210 and ECE 290, with enrollments averaging almost 500 and 400, can easily absorb the 20 or so students annually split between the two courses. Hence, additional costs and impacts will be negligible and can be easily handled by the department.

- c. Effect on course enrollment in other departments and explanations of discussions with representatives of those departments: Minimal. Students taking the programming requirement courses CS 101 or CS 125 will likely do so to satisfy requirements of their major. The core CE Option course CS 231 is one of two alternates and only a few students are expected to enroll annually, a negligible fraction of the average annual enrollment of about 400.
- d. Impact on library, computer use, laboratory use, equipment, etc.: None.

Proposed Effective Date: Spring 2012

Statement for the Programs of Study Catalog: See Appendix B.

Signatures: | Date: |

Educational Policy Committee Representative:

CLEARANCES:

Date:

Appendix A. Distribution Requirement Elective Courses

Credit hours are shown in parentheses

A.1 Approved list of courses on probability/statistics:

ECE 313 – Probability with Engrg Applic (3)

STAT 400 – Statistics and Probability I (4)

MATH 463 – Statistics and Probability I (4)

GE 331 – Analyt Methods for Uncertainty (3)

CEE 202 – Engineering Risk & Uncertainty (3)

EPSY 480 – Educational Statistics (4)

A.2 Advanced Core Electives in EE:

ECE 310 – Digital Signal Processing, I (3)

ECE 329 – Fields and Waves I (3)

ECE 330 – Power Circuits & Electromechanics (3)

ECE 340 – Semiconductor Devices (3)

ECE 342/343 – Electronic Circuits/Laboratory (4)

A.3 Advanced Core Electives in CE:

ECE 385 – Digital Systems Laboratory (2)

ECE 391 – Computer Systems Engineering (4)

ECE 411 – Computer Organization and Design (4)

APPENDIX B. STATEMENT FOR THE PROGRAMS OF STUDY

Electrical and Computer Engineering Minor

Electrical and computer engineering transforms our day-to-day lives through a multitude of innovative technologies and products. The ECE minor is intended to expose students from other disciplines to the unlimited opportunities for innovation in this exciting field, and to the methodologies and tools used by electrical and computer engineers for the exploration and design of new technologies and products. This minor is open to all UIUC undergraduates outside the ECE Department with the exception that Computer Science majors cannot elect the Computer Engineering Option within the Minor.

Hours	Required Courses		
4	Circuits Requirement: ECE 110—Intro Elec & Computer Engrg or ECE 205—Elec & Electronic Circuits + ECE 206—Elec & Electronic Circuits Lab		
3-4	Programming Requirement: one of (with no particular preference) CS 101—Intro Computing: Engrg & Sci CS 125— Intro to Computer Science ECE 190—Intro to Computing Systems		
3-4	A probability or statistics course chosen from an approved list		
10-11	 A. Electrical Engineering Option¹ Core Requirement: ECE 210—Analog Signal Processing Advanced Core Electives: Two ECE courses chosen from an approved list 		
- or -	or		
9-11	 B. Computer Engineering Option¹ Core Requirement²: ECE 290—Computer Engineering I or CS 231—Computer Architecture I Advanced Core Electives: Two ECE courses chosen from an approved list 		
0-5	Elective ECE courses to achieve a minimum of 18 hours of ECE course work ³ .		
19-28	Total		

- 1. To complete the minor, both the Core and Advanced Core courses from Option "A" or "B," must be completed.
- 2. ECE 290 should be taken unless CS 231 credit already exists.
- 3. No additional hours are needed in this category if all courses taken to satisfy the previous requirements are ECE ones.

For more information regarding the Electrical and Computer Engineering minor, visit the <u>Electrical and Computer Engineering minor Web site</u>, contact the Electrical and Computer

Engineering Undergraduate Programs Office (156 Everitt Laboratory, 217-333-0716, ece-advisor@illinois.edu), or visit the Office of the Associate Dean for Undergraduate Programs, 206 Engineering Hall.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Department of Computer Science 201 North Goodwin Avenue Urbana, IL 61801-2302 USA



April 25, 2011

To whom it may concern,

The Computer Science Department has considered the proposed ECE minor, and gives its full endorsement. The minor will provide an opportunity for interested students on campus to explore this field. Any additional load on CS courses will be minimal, and we do not anticipate any need for additional resources due to the inclusion of several CS courses as options in the minor.

We will note that "option B – Computer Engineering Option", would not be appropriate for Computer Science majors, due to the overlap with their existing curriculum. Consequently, we shall request that this option not be made available to CS majors.

Sincerely,

Leonard Pitt

Professor and Director of Undergraduate Programs Department of Computer Science University of Illinois

pitt@illinois.edu

Leng Port

Draft Minutes College of Engineering Executive Committee (EC) Meeting Tuesday, 1:00 p.m., May 3, 2011 301 Engineering Hall

Present:		
D. Abrams (CEE)	B. Heuser (NPRE)	H. Reis (ISE)
M. Bragg (Admin)**	D. Jones (ECE)	C. Tucker (Admin)
D. Ceperley (Phys)	P. Kalita (ABE)	J. Weaver (MatSE)
J. Freund (MechSE)	S. Kamin (CS)	
J. Hart (CS)**	D. Pack (ChBE)	
Absent		
I. Adesida (Admin)	V. Coverstone (Admin)	
SL. Chuang (MNTL)	B. Cunningham (BioE)	
B. Conway (AE)	M. Wong (CSL)	

* = alternate, * = guest

The meeting was called to order at 1:00 pm.

- 1. Welcome to New EC Members by Executive Associate Dean Bragg.
- 2. Importance of the EC Activities by Executive Associate Dean Bragg.
- 3. Annual Budget Overview by Executive Associate Dean Bragg.
- 4. Approval of the draft minutes, April 19, 2011

The minutes were approved unanimously.

5. Old Business

—Review of the policy concerning internship courses. This policy was discussed extensively, with a new issue related to the approval of the work product (written report) identified in the previous policy statement (April 19, 2011 minutes). Specifically, the question was raised as to whether a member of the graduate college should be the only person allowed to sign these reports. This issue will have an impact on the MSE 585 and ENG 572 courses as they are currently described in the respective course proposals.

A motion to add the requirement of graduate college member approval to the written work product(s) to the internship course to the COE EC policy was approved.

- —Review of MSE 585 proposal.
- 6. Course and Program Proposals/Reports
 - a. New/Revised Course Outlines and Program Proposals
 - —B.S in Agricultural and Biological Engineering New Courses
 - -ABE 223 "ABE Principles: Machine Syst"

- —ABE 224 "ABE Principles: Soil & Water"
 —ABE 225 "ABE Principles: Bioenviron"
 —ABE 226 "ABE Principles: Bioprocessing"
- The COE EC unanimously approved the revision to the B.S curriculum and the associated new courses without forwarding for review to an ad hoc committee.

—CEE 445 "Air Quality Modeling"

The CEE department is requested to provide clarification of the 1 additional course credit hour based on one contact hour per week of laboratory. COE policy is 2 to 3 contact hours per course credit hour. Alternatively, other work products such as laboratory reports outside of lab/lecture meeting time is required to meet the COE policy. The current CEE 445 appears to be deficient with regard to this policy and further information is required before the COE EC will consider the proposal.

—CEE 553 "River Morphodynamics"

The review of this course has been assigned to the following ad hoc committee: P. Kumar (CEE), R. Cooke (ABE), M. Matalon (MechSE), chair.

- —ENG 572 "Energy Systems Practicum"
- -ENG 573 "Energy Systems Project"
- b. Subcommittee Reports
 - CEE 411 "RR Project Design & Constr"
 - CS 528 "Obj-Oriented Progrmg & Design"
 - Undergraduate Minor in Electrical and Computer Engineering
 - ECE 526 "Distributed Algorithms"

The above subcommittee reports were all unanimously approved.

- 7. A resolution recognizing Dean Pleck's contribution to the COE was read aloud and is hereby entered into the EC minutes.
- 8. Adjournment: The meeting adjourned at 2:30 pm.

The minutes have not yet been approved. Respectfully submitted,

Brent J. Heuser

Brent J. Heuser, Secretary

cc: Samuel Kamin Jean Hanks Michael Pleck