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Changes proposed by: John Popovics

Catalog Pages Using this Program	Civil Engineering, BS

Proposal Type:

In Workflow

1. **U Program Review**
2. **1251 Head**
3. **KP Committee Chair**
4. **KP Dean**
5. **University Librarian**
6. **Provost**
7. **Senate EPC**
8. Senate
9. U Senate Conf
10. Board of Trustees
11. IBHE
12. HLC
13. DMI

Approval Path

1. 01/05/22 2:30 pm
   Deb Forgacs (dforgacs):
   Approved for U Program Review
2. 01/05/22 3:22 pm
   John Popovics (johnpop):
   Approved for 1251 Head
3. 02/03/22 11:39 am
   Brooke Newell (bsnewell):
   Approved for KP Committee Chair
4. 02/03/22 11:47 am
   Candy Deaville (candyd):
   Approved for KP Dean
5. 02/03/22 11:54 am

John Wilkin (jpwilkin): Approved for University Librarian
6. 02/03/22 4:14 pm Kathy Martensen (kmartens): Approved for Provost

History

1. Dec 13, 2018 by Deb Forgacs (dforgacs)
2. Apr 25, 2019 by Deb Forgacs (dforgacs)
3. Aug 12, 2019 by Deb Forgacs (dforgacs)
4. Feb 26, 2020 by Brooke Newell (bsnewell)
5. Mar 31, 2020 by Deb Forgacs (dforgacs)
6. Apr 14, 2020 by Deb Forgacs (dforgacs)
7. May 5, 2021 by Becky Stillwell (rborden)
8. Oct 10, 2021 by Brooke Newell (bsnewell)

Major (ex. Special Education)

This proposal is for a:
Revision

Administration Details

Official Program Name	Civil Engineering, BS

Sponsor College	Grainger College of Engineering
Sponsor Department	Civil and Environmental Engineering
Sponsor Name	John Popovics
Sponsor Email	johnpop@illinois.edu
College Contact	Jonathan Makela ~~Brooke Newell~~
College Contact Email	jmakela@illinois.edu ~~bsnewell@illinois.edu~~
College Budget Officer	Tessa Hile
College Budget Officer Email	tmhile@illinois.edu

List the role for rollbacks (which role will edit the proposal on questions from EPC, e.g., Dept Head or Initiator) and/or any additional stakeholders. *Purpose: List here who will do the editing work if proposal needs rolled back. And any other stakeholders.*

Brooke Newell,bsnewell@illinois.edu, GCOE
John Popovics,johnpop@illinois.edu, Associate Head CEE
Becky Stillwell, rborden@illinois.edu, Senior Academic Advisor, CEE

Does this program have inter-departmental administration?

No

Proposal Title

Effective Catalog Term	Fall 2022

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

Removed Liberal Education Electives, updated the number of free elective hours, and move footnotes into the Program of Study Table (to improve accessibility). Replaced MATH 225 with MATH 257. Allowed for students to take CEE 331 in place of TAM 335. Updated class options in the science elective, engineering technical core, and advanced technical course sections. Rearranged presentation of primary and secondary course material. Revised the Primary and Secondary Field courses to reflect only undergraduate hours when applicable.

List here any related proposals/revisions and their keys. *Example: This BS proposal (key 567) is related to the Concentration A proposal (key 145) and the Concentration B proposal (key 203).*

Program Justification

Why are these changes necessary?

After careful analysis of programs of studies, various requirements, and course selection for students in The Grainger College of Engineering, we have decided to provide additional flexibility to all engineering undergraduate students by increasing the number of free elective hours in all engineering programs. While the actual number of credit hours for free electives varies by program, within the college-8 programs currently provide only 6 credit hours for free electives while an additional 2 have less than 10-only 4 programs have more than 10 free elective credits. This lack of free elective credit hours limits students' abilities to efficiently pursue minors, certificates, and other educational opportunities and potentially limits those opportunities only to students coming in with significant AP credit or similar.

The additional free elective credit hours added to the program of study are obtained through the removal of The Grainger College of Engineering's Liberal Education requirement, which required engineering students to take an additional 6 credit hours above-and-beyond the campus' General Education requirement from the Humanities & the Arts, Social & Behavioral Sciences, or a college-curated list of courses. Over time, the Liberal Education requirement has been revised within the college, successively relaxing restrictions and providing additional choice to students (i.e., removal of a sequencing requirement in 1999; addition of the college-curated course list in 2010). Simultaneously, the college-curated list of courses continued to expand to include courses from approximately 120 rubrics across campus (including within The Grainger College of Engineering), gradually removing constraints to allow greater flexibility of choice for students to take advantage of the many opportunities the campus has to offer. Still, in its current form, this additional college-level requirement constrains student choice and interferes with their ability to efficiently pursue minors, certificates, and other educational opportunities across campus unless those opportunities intersect with coursework in the Liberal Education requirement.

Simultaneously, the required engineering orientation course, ENG 100, will be granted 1-credit hour. Previously, this course was a 0-credit course. The allocation of 1-credit appropriately recognizes the time and commitment expected of all students who take this course. In the 1-credit version of ENG 100 content will be added to improve teamwork and interpersonal skills, including topics related to diversity, equity, and inclusion (DEI). The engineering accrediting agency, ABET, will soon be adding DEI requirements for accredited programs. This component of ENG 100 is therefore beneficial to all Grainger Engineering programs and students by providing a common framework on which additional DEI topics can build throughout a student's program of study.

The required course MATH 225 has been replaced with MATH 257, a new course that has been developed in a collaboration between Mathematics and Engineering to better serve the needs of Engineering students by integrating programming skills into the course. MATH 225 and MATH 415 will be allowed acceptable substitutions to MATH 257, however, because both classes cover reasonable overlaps of the content of CEE 257, although without the focus on programming skills.

The new options in the science elective, engineering technical core, and advanced technical course sections were added to reflect new course additions and old and

outdated course removals.

The presentation of primary and secondary course material was rearranged in order to improve students' interpretation and advising clarity.

The Primary and Secondary Field hours were revised to reflect only undergraduate hours rather than undergraduate or graduate hours.

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?

Yes

Required courses

~~BTW 261~~ - ~~Principles Tech Comm~~
~~CEE 480~~ - ~~Foundation Engineering~~
MATH 257 - Linear Algebra w Computat Appl
TAM 335 - Introductory Fluid Mechanics

Explain how the inclusion or removal of the courses/subjects listed above impacts the offering departments.

The current Liberal Education requirement is satisfied by a student completing 6 credit hours beyond those required by campus' General Education requirement from Humanities & the Arts, Social & Behavioral Sciences, or a college-curated list of courses (containing courses from over 120 rubrics across campus). An analysis of student course selection in the Liberal Education category indicates 25% of courses are taken in the College of Liberal Arts & Sciences, 20% from the College of Applied Health Sciences, 18% from Gies College of Business, 11% from the College of Agricultural, Consumer and Environmental Sciences, 11% from the College of Fine and Applied Arts, and 9% from The Grainger College of Engineering. Less than 2% of credits are taken in each of the remaining colleges and units across campus.

Although it might stand to reason that removal of the Liberal Education requirement would reduce the amount of credits Grainger Engineering students take outside of their home college, the data do not support that assertion. Specifically, despite the current Liberal Education requirement being set at 6 credit hours, the average number of credit hours completed from the Liberal Education course list upon graduation is 11.9. Through discussions with departmental and college advisors as well as students,

students are making course selections not because the course satisfies the Liberal Education requirement, but because they are interested in the coursework offered outside of their home college, are pursuing minors and other educational opportunities, and are looking to balance course loads between technical and non-technical courses. Taken together, the data and evidence from advisors and students suggest that students will continue to take the types of courses represented on the Liberal Education course list, even if not specifically required to do so.

MATH 257 will replace MATH 225 in the degree requirements. The Mathematics department has planned to allocate resources as needed to support this change.

Due to the overlap between TAM 335 and CEE 331 (newly established course), credit can't be awarded for both courses. A subset of CEE students will be allowed to enroll in CEE 331. Thus, we expect a minimal reduction of CEE student enrollment in TAM 335 (~10 students per year).

Attach letters of support or acknowledgement from other departments.	CEE_letter_Math_257.pdf MechSE Letter.pdf Letters of Acknowledgement - Liberal Education Electives.pdf

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).

~~Monitoring of changes and action items Reviewed annually at retreats Allfaculty.Monitoring of changes and action items Discussed at committee meetings (ongoing) Curriculumcommittee.Program outcomes and learningobjectives:~~The Civil and Environmental Engineering Program prepares graduates to achieve the following student outcomes by the time of graduation. ~~graduation:~~ The CEE program ~~Program~~ outcomes and learning objectives are the following: ~~objectives:~~

1. Successfully enter the civil and environmental engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that include structural, transportation, geotechnical, materials, environmental, and water resources engineering; construction management; and emerging fields including sustainability, resilience, and risk.

2. Pursue graduate education and research at major research universities ~~in civil~~ and national laboratories in civil ~~environmental engineering,~~ and environmental engineering, and related fields.

3. Pursue professional licensure.

4. Advance to leadership positions in their profession.

5. Engage in continued learning through professional development.

6. Participate in and contribute to professional societies and community service.

In order ~~The above addresses the process~~ to ensure assessment results are used to improve student learning, in accordance with our accrediting board ABET, the following assessments process is carried out. ~~board, ABET.~~

Each semester, detailed curse outcome assessments are completed ~~Course Outcome Assessments (Completed~~ by instructors ~~Instructors) All~~ of the required courses (CEE 190, ~~195,~~ 201, 202 & 495), core courses (CEE 300, 310, 320, 330, 340, 350, 360, & 380), integrated design courses (CEE 401, 415, 421, 449, 453, 465, 484 & 493), and laboratory courses (CEE 300, 401, 405, 449, 458 & 483). ~~483)comprising the Illinois CEE undergraduate program collectively represent the essential elements of the curriculum.~~ This subset of classes comprise the Illinois CEE undergraduate program collectively and represent the essential elements of the curriculum.

Our primary processes for regularly assessing and evaluating the extent to which the student outcomes are being attained therefore focus on direct assessment related to these 23 courses. At the end of the semester, instructors of those 23 classes are asked to complete a "CEE ABET 1-7 Course Outcome Assessment" form, and at the beginning of a term instructors of those same courses are provided with a completed version of the form from a previous offering of the course for their information and further

consideration. The form asks the instructor of a course to first specifically indicate how much they feel their class helped students to develop each outcome (on a 1-5 scale, where "5" means a great deal of emphasis was placed on that particular outcome). It then also asks for the rubrics they use to assess students' performance ratings in terms of the 1-7 students outcomes, as well as what is the percentage of students in the class attaining the level deemed satisfactory for each outcome (assuming they have assessed on that particular outcome). For the most important student outcomes in a course (those having an emphasis score of 4 or 5), the expected level of attainment is ideally greater than 80%. The forms, which are collected and maintained by the CEE Associate Head and Director of Undergraduate Studies for documentation purposes, further ask instructors to reflect on what are their overall impressions of a course and how it might be improved, which is valuable to future instructors of the class and/or even to themselves the next time they teach the course. ~~The above addresses the process to ensure assessment results are used to improve student learning, in accordance with our accrediting board, ABET.~~

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 Civil Engineering, BS Side by Side.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.

Recently ~~No Changes...recently~~ updated.

Statement for Programs of Study Catalog

Graduation Requirements

Minimum Overall GPA: 2.0

Minimum hours required for graduation: 128 hours

General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 ~~(ECON 102~~ or ECON 103). ~~ECON 103).~~ CEE 300 will satisfy a Civil Engineering core course requirement and the Campus General Education Advanced Composition requirement.

~~**Specific Advanced Composition course required for this degree is listedbelow.**~~

Orientation and Professional Development

Course List

Code	Title	Hours
CEE 190	Project-Based Introduction to CEE	4
CEE 495	Professional Practice	0
ENG 100	Grainger Engineering Orientation Seminar (External transfer students take ENG 300.)	1
Total Hours		5

Foundational Mathematics and Science

Course List

Code	Title	Hours
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
MATH 221	Calculus I (MATH 220 may be substituted. MATH 220 is appropriate for students with no background in calculus. 4 of 5 credit hours count towards degree.)	4
~~MATH 225~~	~~Introductory Matrix Theory~~	~~2~~
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 257	Linear Algebra with Computational Applications (MATH 225 or MATH 415 may be substituted)	3
MATH 285	Intro Differential Equations (MATH 284 or MATH 286 may be substituted. Extra hour counts towards free electives)	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
Total Hours		35

Civil Engineering Technical Core ~~Science Elective~~

Course List

~~Code~~	~~Title~~	~~Hours~~
~~Science elective, selected in accord with recommendations for the chosen primary field in civil engineering.~~		~~3~~
~~ATMS 120~~	~~Severe and Hazardous Weather~~	~~3~~
~~CHBE 321~~	~~Thermodynamics~~	~~4~~
~~CHEM 222~~	~~Quantitative Analysis Lecture~~	~~2~~

Code	Title	Hours
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
ME 200	Thermodynamics	3
STAT 420	Methods of Applied Statistics	3 or 4

Course List

Code	Title	Hours
CEE 201	Systems Engrg & Economics	3
CEE 202	Engineering Risk & Uncertainty	3
CS 101	Intro Computing: Engrg & Sci	3
SE 101	Engineering Graphics & Design	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 335	Introductory Fluid Mechanics	4
or CEE 331	Fluid Dynamics in the Natural and Built Environment	
Total Hours		25

Civil Engineering Primary ~~Technical ElectivesStudents choose primary~~ and Secondary Fields

Course List

Code	Title	Hours
~~Civil engineering technical courses, selected as follows, to at least include:~~		~~34~~
Students choose a primary and a secondary field of study, of which there are seven traditional areas of study and three interdisciplinary programs to choose from. The particular primary and secondary field selectons shape the selection of science electives, civil engineering core courses and advanced technical electives. The specific choices of courses in this category are made through the submission of a Plan of Study, which is subject to approval by the faculty Program Review Committee. Instead of choosing separate primary and secondary field options as listed below, students could select to pursue the General Civil Engineering Option. The General Civil Engineering Option offers a broader coverage of Civil Engineering topical areas. This option can be found below the Secondary Field list.		
Primary Field. Students choose 1 primary field, in which they must take 1 science elective course (3-4 hours), 15-16 hours of 300 level Civil Engineering Core Courses from departmentally approved list, and 12-13 hours of 400 level Advanced Technical Electives from departmentally approved list.		31
Construction Engineering and Management Primary		
Science Electives - Select 1 course from list below:		
ATMS 120	Severe and Hazardous Weather	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4
ECE 205	Electrical and Electronic Circuits	3
FIN 221	Corporate Finance	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
ME 200	Thermodynamics	3
NPRE 201	Energy Systems	3

Code	Title	Hours
SE 400	Engineering Law	3 or 4
STAT 420	Methods of Applied Statistics	3 or 4
UP 205	Ecology & Environmental Sustainability	3
Civil Engineering Core Courses		
Required courses:		
~~The courses that are required and recommended for the primary and secondary fields are listed below. Select at least 5 courses from the following list:~~		~~15-16~~
~~CEE 300~~	~~Behavior of Materials 6~~	~~4~~
CEE 300	Behavior of Materials	4
CEE 320	Construction Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Select 1 course from list below:		
CEE 310	Transportation Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
~~Civil Engineering Core Courses Recommended:~~		
CEE 350	Water Resources Engineering	3
Advanced Technical Courses		
~~Science Electives Required - None~~		
~~Science Electives Recommended:~~		
Required courses:		
CEE 420	Construction Productivity	3 or 4
CEE 421	Construction Planning (Required Integrated Design Course)	3 or 4
CEE 422	Construction Cost Analysis	3 or 4
Select remaining courses to fulfill this requirement from the list below:		
CEE 401	Concrete Materials	4
CEE 461	Reinforced Concrete I	3
CEE 498	Special Topics (As approved)	4
CEE 498	Special Topics (Construction Equipment Methods)	3
Construction Materials Engineering Primary		
~~Science Electives Required - None~~		
~~Science Electives Recommended:~~		
Science Electives - Select 1 course from list below:		
~~Science Electives Required - None~~		
~~Science Electives Recommended:~~		
GEOL 107	Physical Geology	4
MSE 201	Phases and Phase Relations	3
Civil Engineering Core Courses		
~~Science Electives Required:~~		
Required courses:		
CEE 300	Behavior of Materials	4

Code	Title	Hours
CEE 310	Transportation Engineering	3
CEE 360	Structural Engineering	3
Select 2 courses from list below:		
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
~~Civil Engineering Core Courses Recommended:~~		
CEE 350	Water Resources Engineering	3
~~Advanced Technical Courses Required:~~		
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses		
~~Science Electives Required - None~~		
~~Science Electives Recommended:~~		
Required courses:		
CEE 401	Concrete Materials (Required Integrated Design Course)	4
CEE 405	Asphalt Materials I	3 or 4
Select remaining courses to fulfill this requirement from the list below:		
CEE 406	Pavement Design I	3 or 4
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
~~CEE 469~~	~~Wood Structures~~	~~3 or 4~~
CEE 469	Wood Structures	3 or 4
CEE 483	Soil Mechanics and Behavior	4
ME 430	Failure of Engrg Materials	3 or 4
MSE 401	Thermodynamics of Materials	3
MSE 402	Kinetic Processes in Materials	3
MSE 406	Thermal-Mech Behavior of Matls	3
~~MSE 420~~	~~Ceramic Materials & Properties~~	~~3~~
MSE 450	Polymer Science & Engineering	3 or 4
TAM 428	Mechanics of Composites	3
Environmental Engineering Primary		
~~Science Electives Required - None~~		
~~Science Electives Recommended:~~		
Science Electives - Select 1 course from list below:		
~~Science Electives Required - Choose one course from recommended list below:~~		
~~Science Electives Recommended:~~		
CHEM 232	Elementary Organic Chemistry I	3 or 4
CS 357	Numerical Methods I	3
GEOL 107	Physical Geology	4
MCB 300	Microbiology	3

Code	Title	Hours
ME 200	Thermodynamics	3
MSE 401	Thermodynamics of Materials	3
STAT 420	Methods of Applied Statistics	3 or 4
Civil Engineering Core Courses		
~~Civil Engineering Core Courses Required:~~		
Required course:		
CEE 330	Environmental Engineering	3
Select 4 courses from list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
~~Civil Engineering Core Courses Recommended:~~		
CEE 320	Construction Engineering	3
~~Advanced Technical Courses Required:~~		
CEE 340	Energy and Global Environment	3
~~CEE 350~~	~~Water Resources Engineering~~	~~3~~
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses		
~~Civil Engineering Core Courses Required:~~		
Select 1 course from list below:		
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
~~CEE 445~~	~~Course CEE 445 Not Found~~	
~~CEE 446~~	~~Air Quality Engineering~~	~~4~~
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution sources, Transport and Control)	4
Select remaining courses to fulfill this requirement from the list below:		
CEE 430	Ecological Quality Engineering	2
CEE 434	Environmental Systems I	3
CEE 435	Public Health Engineering	3 or 4
CEE 438	Science & Environmental Policy	3
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4
~~CEE 445~~	~~Course CEE 445 Not Found~~	
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab (Required Integrated Design Course)	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 493	Sustainable Design Eng Tech	4
~~Advanced Technical Courses Recommended:~~		
Geotechnical Engineering Primary		
~~Civil Engineering Core Courses Required:~~		

Code	Title	Hours
Science Elective required course:		
~~Civil Engineering Core Courses Required:~~		
GEOL 107	Physical Geology	4
Civil Engineering Core Courses		
~~Civil Engineering Core Courses Required:~~		
Required courses:		
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
~~Civil Engineering Core Courses Recommended:~~		
Select 3 courses from the list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
~~Civil Engineering Core Courses Recommended:~~		
CEE 350	Water Resources Engineering	3
~~Civil Engineering Core Courses Recommended:~~		
Advanced Technical Courses		
~~Civil Engineering Core Courses Required:~~		
Required courses:		
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics (Required Integrated Design Course)	4
~~Advanced Technical Courses Recommended:~~		
Select remaining courses to fulfill this requirement from the list below:		
CEE 457	Groundwater	3
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 463	Reinforced Concrete II	3 or 4
CEE 498	Special Topics (As approved)	3-4
Structural Engineering Primary		
~~Civil Engineering Core Courses Required:~~		
Science Electives - Select 1 course from list below:		
~~Civil Engineering Core Courses Required:~~		
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
ME 200	Thermodynamics	3
~~Civil Engineering Core Courses:~~		
Civil Engineering Core Courses		
~~Civil Engineering Core Courses Required - None~~		
~~Advanced Technical Courses Required:~~		
Required courses:		
CEE 300	Behavior of Materials	4
CEE 360	Structural Engineering	3

Code	Title	Hours
CEE 380	Geotechnical Engineering	3
~~Civil Engineering Core Courses Recommended:~~		
Select 2 courses from list below:		
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
CEE 350	Water Resources Engineering	3
~~Advanced Technical Courses Required:~~		
Advanced Technical Courses		
~~Civil Engineering Core Courses Required:~~		
Required courses:		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems (Required Integrated Design Course)	3
CEE 470	Structural Analysis	4
~~Advanced Technical Courses Recommended - None~~		
Transportation Engineering Primary		
~~Science Electives Recommended:~~		
~~CPSC 116~~	~~The Global Food Production Web~~	~~3~~
~~ESE 140~~	~~Climate and Global Change~~	~~3~~
~~ESE 320~~	~~Water Planet, Water Crisis~~	~~3~~
~~ESE 482~~	~~Challenges of Sustainability~~	~~3~~
~~Civil Engineering Core Courses Recommended:~~		
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
~~or CEE 350~~	~~Water Resources Engineering~~	
Science Electives - Select 1 course from list below:		
~~Science Electives Recommended: Any recommended science electives from existing CEE Primary and Secondary listed above~~		
~~Civil Engineering Core Courses Recommended: Core courses relevant to the student's interests~~		
~~Advanced Technical Courses: Students work with CEE Academic Advisors~~		
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
ME 200	Thermodynamics	3
ME 340	Dynamics of Mechanical Systems	3.5
MSE 401	Thermodynamics of Materials	3
SE 320	Control Systems	4
STAT 420	Methods of Applied Statistics	3 or 4
~~Civil Engineering Core Courses Required:~~		
Civil Engineering Core Courses		
~~Civil Engineering Core Courses Required:~~		
Required courses:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
Select 3 courses from the list below:		

Code	Title	Hours
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
~~Advanced Technical Courses Required:~~		
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
~~Advanced Technical Courses: You must select one course from each of the three Areas below and one course from the recommended list.~~		
Advanced Technical Courses - Select 1 course from each of the 3 Areas below and 1 course from the recommended list:		
~~Civil Engineering Core Courses Required:~~		
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
~~Advanced Technical Courses Recommended:~~		
Area 1 - Facilities		
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
Area 2 - Systems:		
CEE 407	Airport Design	3 or 4
CEE 415	Geometric Design of Roads (Required Integrated Design Course)	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 418	Public Transportation Systems	3 or 4
Area 3 - Railroad:		
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
Advanced Technical Courses Recommended:		
CEE 401	Concrete Materials	4
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4

Code	Title	Hours
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
CEE 412	High-Speed Rail Engineering	3 or 4
CEE 415	Geometric Design of Roads (Required integrated design course)	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3 or 4
Water Resources Engineering and Science Primary		
~~Civil Engineering Core Courses Required:~~		
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
Science Electives - Select 1 course from list below:		
~~Civil Engineering Core Courses Required:~~		
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
~~Advanced Technical Courses Recommended:~~		
CS 357	Numerical Methods I	3
GEOL 107	Physical Geology	4
ME 200	Thermodynamics	3
~~Civil Engineering Core Courses Required:~~		
Civil Engineering Core Courses		
~~Civil Engineering Core Courses Required:~~		
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
~~Advanced Technical Courses Recommended:~~		
Required course:		
CEE 350	Water Resources Engineering	3
Select 4 courses from the list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
~~Advanced Technical Courses Required: Select 2 courses, each from a different Area~~		
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
~~Civil Engineering Core Courses Recommended:~~		
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
~~Advanced Technical Courses Required (Choose one):~~		
Advanced Technical Courses		
Required courses - Select 1 from list below:		
CEE 452	Hydraulic Analysis and Design	3

Code	Title	Hours
CEE 453	Urban Hydrology and Hydraulics (Required Integrated Design Course)	4
~~Advanced Technical Courses Recommended:~~		
Select remaining courses to fulfill this requirement from the list below:		
CEE 432	Stream Ecology	3 or 4
CEE 433	Water Technology and Policy	3 or 4
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 450	Surface Hydrology	3
CEE 451	Environmental Fluid Mechanics	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 458	Water Resources Field Methods	4
CEE 459	Ecohydraulics (Ecohydraulics)	4
Energy-Water-Environment Sustainability Primary Science Electives - Select 1 course from list below:		
ME 200	Thermodynamics	3
~~STAT 400~~	~~Statistics and Probability I~~	~~4~~
~~Civil Engineering Core Courses Required - Should take 7 courses from list below:~~		
CHBE 321	Thermodynamics	4
Civil Engineering Core Courses		
Required course:		
CEE 340	Energy and Global Environment	3
~~Advanced Technical Courses Recommended: Must take at least 3 credit hours in each of the 2 areas below:~~		
Select 4 courses from the list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
~~Advanced Technical Courses Required:~~		
Advanced Technical Courses		
Required course:		
CEE 493	Sustainable Design Eng Tech	4
Select remaining courses to fulfill this requirement from the list below:		
ABE 436	Renewable Energy Systems	3 or 4
~~ARCH 441~~	~~Heat and Moisture in Buildings~~	~~3~~
CEE 433	Water Technology and Policy	3 or 4
CEE 435	Public Health Engineering	3 or 4

Code	Title	Hours
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
~~CEE 446~~	~~Air Quality Engineering~~	~~4~~
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4
CEE 449	Environmental Engineering Lab	3
CEE 450	Surface Hydrology	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 459	Ecohydraulics (Ecohydraulics)	4
CEE 473	Wind Effects on Structures	4
CEE 492	Data Science for Civil and Environmental Engineering (Data Science for Civil and Environmental Engineering)	4
CEE 498	Special Topics (As approved)	4
ENG 471	Seminar Energy & Sustain Engrg	1
ME 400	Energy Conversion Systems	3 or 4
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 475	Wind Power Systems	3 or 4
Societal Risk and Hazard Mitigation Primary Science Electives - Select 1 course from list below:		
FIN 230	Introduction to Insurance	3
GEOL 118	Natural Disasters	3
LAW 301	Introduction to Law	3
NRES 287	Environment and Society	3
STAT 420	Methods of Applied Statistics	3 or 4
~~Civil Engineering Core Courses Required:~~		
Civil Engineering Core Courses		
Required course:		
CEE 340	Energy and Global Environment	3
Select 4 courses from list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
~~Advanced Technical Courses Required:~~		
CEE 330	Environmental Engineering	3
~~Advanced Technical Courses Required - Choose 2 courses from the recommended list below:~~		
CEE 350	Water Resources Engineering	3
~~Advanced Technical Courses Required: 2 courses from the recommended list below:~~		
~~Advanced Technical Courses Recommended:~~		
CEE 360	Structural Engineering	3
~~Advanced Technical Courses Required:~~		
CEE 380	Geotechnical Engineering	3

Code	Title	Hours
~~Advanced Technical Courses Required:~~		
Advanced Technical Courses		
Required course:		
CEE 491	Decision and Risk Analysis	3 or 4
~~Advanced Technical Courses Recommended:~~		
Select remaining courses to fulfill this requirement from list below:		
CEE 406	Pavement Design I	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 449	Environmental Engineering Lab	3
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems	3
CEE 472	Structural Dynamics I	3 or 4
CEE 473	Wind Effects on Structures	4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
NPRE 442	Radioactive Waste Management	3
SE 450	Decision Analysis I	3 or 4
STAT 425	Statistical Modeling I	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 430	Topics in Applied Statistics	3 or 4
UP 438	Disasters and Urban Planning	4
Sustainable and Resilient Infrastructure Systems Primary		
Science Electives - Select 1 course from list below:		
ATMS 120	Severe and Hazardous Weather	3
CS 357	Numerical Methods I	3
ENSU 300	Environmental Sustainability	3
ESE 140	Climate and Global Change	3
ESE 320	Water Planet, Water Crisis	3
ESE 482	Challenges of Sustainability	3
FIN 221	Corporate Finance	3
~~GEOG 103~~	~~Course GEOG 103 Not Found~~	
GGIS 103	Earth's Physical Systems	4
NPRE 201	Energy Systems	3
NRES 439	Env and Sustainable Dev	3
SE 320	Control Systems	4

Code	Title	Hours
STAT 420	Methods of Applied Statistics	3 or 4
UP 406	Urban Ecology	4
~~Civil Engineering Core Courses Required:~~		
Civil Engineering Core Courses		
Required course:		
CEE 340	Energy and Global Environment	3
Select 4 courses from list below:		
CEE 300	Behavior of Materials	4
~~Advanced Technical Courses Required - Pick 2 courses from the recommended list below:~~		
~~Advanced Technical Courses Recommended:~~		
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
~~CEE 380~~	~~Geotechnical Engineering~~	~~3~~
~~Advanced Technical Courses Required:~~		
CEE 360	Structural Engineering	3
~~CEE 380~~	~~Geotechnical Engineering~~	~~3~~
~~Primary Field Advanced Technical Electives. Select courses from approved lists for appropriate programs of study within the seven areas or three interdisciplinary programs of civil engineering. Design experience is distributed in 200-level, 300-level, and 400-level CEE courses including integrated design courses. See list below:~~		~~12-13~~
CEE 380	Geotechnical Engineering	3
~~Advanced Technical Courses Required - Option I: Pick no more than one course from each area below such that the sum of the core and advanced courses is at least 34 credit hours. Option II: Pick 2 courses from one area and no more than one course from each of the remaining areas to total 34 credit hours.~~		
Advanced Technical Courses		
Required course:		
CEE 491	Decision and Risk Analysis	3 or 4
~~Advanced Technical Courses Recommended:~~		
Select remaining courses to fulfill this requirement from list below:		
ABE 436	Renewable Energy Systems	3 or 4
CEE 401	Concrete Materials	4
CEE 406	Pavement Design I	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4

Code	Title	Hours
CEE 418	Public Transportation Systems	3 or 4
CEE 421	Construction Planning	3 or 4
~~CEE 424~~	~~Sustainable Const Methods~~	~~4~~
CEE 424	Sustainable Const Methods	4
CEE 434	Environmental Systems I	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 458	Water Resources Field Methods	4
CEE 465	Design of Structural Systems	3
CEE 493	Sustainable Design Eng Tech	4
CEE 498	Special Topics (As approved)	3-4
~~ENG 471~~	~~Seminar Energy & Sustain Engrg~~	~~1~~
MSE 489	Matl Select for Sustainability	3 or 4
UP 466	Energy & the Built Environment	4
UP 480	Sustainable Design Principles	2
Secondary Field. Students choose 1 secondary field that is different from but complements and adds breadth to their primary field selection. This should be done in consultation with academic advisor. See list of classes for each area of study below.		6
Construction Engineering and Management Secondary		
Students must have taken CEE 320 to pursue this Secondary Field.		
Advanced Technical Courses		
Required course:		
CEE 421	Construction Planning	3
Select 1 course from list below:		
CEE 420	Construction Productivity	3
CEE 422	Construction Cost Analysis	3
Construction Materials Engineering Secondary		
Students must have taken CEE 300 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 2 courses from list below:		
CEE 401	Concrete Materials	4
CEE 405	Asphalt Materials I	3
CEE 406	Pavement Design I	3
Environmental Engineering Secondary		
Students must have taken CEE 330 to pursue this Secondary Field.		
Advanced Technical Courses		
Select at least 2 courses from list below, a minimum of 6 credit hours required.		
CEE 430	Ecological Quality Engineering	2
CEE 434	Environmental Systems I	3
CEE 435	Public Health Engineering	3
CEE 437	Water Quality Engineering	3
CEE 438	Science & Environmental Policy	3
~~CEE 445~~	~~Course CEE 445 Not Found~~	
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4

Code	Title	Hours
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4
~~CEE 446~~	~~Air Quality Engineering~~	~~4~~
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab	3
Geotechnical Engineering Secondary		
Students must have taken CEE 380 to pursue this Secondary Field.		
Advanced Technical Courses		
Required course:		
CEE 484	Applied Soil Mechanics	3
~~Advanced Technical Courses Recommended - NONE~~		
Select 1 course from list below:		
CEE 483	Soil Mechanics and Behavior	4
CEE 498	Special Topics (As approved)	3-4
Structural Engineering Secondary		
Students must have taken CEE 360 to pursue this Secondary Field.		
Advanced Technical Courses		
Required courses:		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
Transportation Engineering Secondary		
Students must have taken CEE 310 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 2 courses, each from a different Area listed below:		
Area 1 - Facilities:		
CEE 405	Asphalt Materials I	3
CEE 406	Pavement Design I	3
CEE 407	Airport Design	3
Area 2 - Systems:		
CEE 407	Airport Design	3
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3
CEE 418	Public Transportation Systems	3
Area 3 - Railroad:		
CEE 408	Railroad Transportation Engrg	3
CEE 409	Railroad Track Engineering	3
CEE 410	Railway Signaling & Control	3
CEE 411	RR Project Design & Constr	3
CEE 412	High-Speed Rail Engineering	3
Water Resources Engineering and Science Secondary		
Students must have taken CEE 350 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 2 courses from list below:		
CEE 432	Stream Ecology	3
CEE 433	Water Technology and Policy	3
CEE 450	Surface Hydrology	3

Code	Title	Hours
CEE 451	Environmental Fluid Mechanics	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 458	Water Resources Field Methods	4
CEE 459	Ecohydraulics (Ecohydraulics)	4
Energy-Water-Environment Sustainability Secondary		
Students must have taken CEE 340 to pursue this Secondary Field.		
Advanced Technical Courses		
Required course:		
CEE 493	Sustainable Design Eng Tech	4
~~Advanced Technical Courses Recommended:~~		
Select 1 course from list below:		
ABE 436	Renewable Energy Systems	3 or 4
~~ARCH 441~~	~~Heat and Moisture in Buildings~~	~~3~~
~~CEE 424~~	~~Sustainable Const Methods~~	~~4~~
CEE 433	Water Technology and Policy	3
CEE 434	Environmental Systems I	3
CEE 435	Public Health Engineering	3
CEE 437	Water Quality Engineering	3
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4
CEE 449	Environmental Engineering Lab	3
CEE 450	Surface Hydrology	3
~~CEE 452~~	~~Hydraulic Analysis and Design~~	~~3~~
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 459	Ecohydraulics (Ecohydraulics)	4
CEE 473	Wind Effects on Structures	4
CEE 492	Data Science for Civil and Environmental Engineering (Data Science for Civil and Environmental Engineering)	4
CEE 498	Special Topics (As approved)	3-4
ME 400	Energy Conversion Systems	3 or 4
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 475	Wind Power Systems	3 or 4
Societal Risk and Hazard Mitigation Secondary		
Advanced Technical Courses		
Required course:		
CEE 491	Decision and Risk Analysis	3
~~Advanced Technical Courses Recommended:~~		
Select 1 course from the list below:		
CEE 406	Pavement Design I	3

Code	Title	Hours
CEE 416	Traffic Capacity Analysis	3
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
~~CEE 446~~	~~Air Quality Engineering~~	~~4~~
CEE 440	Fate Cleanup Environ Pollutant	4
~~CEE 446~~	~~Air Quality Engineering~~	~~4~~
CEE 449	Environmental Engineering Lab	3
~~CEE 460~~	~~Steel Structures I~~	~~3~~
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems	3
CEE 472	Structural Dynamics I	3
CEE 473	Wind Effects on Structures	4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
NPRE 442	Radioactive Waste Management	3
SE 450	Decision Analysis I	3 or 4
STAT 425	Statistical Modeling I	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 430	Topics in Applied Statistics	3 or 4
UP 438	Disasters and Urban Planning	4
Sustainable and Resilient Infrastructure Systems Secondary		
Students must have taken CEE 340 to pursue this Secondary Field.		
Advanced Technical Courses		
Required course:		
CEE 491	Decision and Risk Analysis	3
~~Advanced Technical Courses Recommended:~~		
Select 1 course from the list below:		
ABE 436	Renewable Energy Systems	3 or 4
CEE 401	Concrete Materials	4
CEE 406	Pavement Design I	3
CEE 408	Railroad Transportation Engrg	3
CEE 409	Railroad Track Engineering	3
CEE 416	Traffic Capacity Analysis	3
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3
CEE 421	Construction Planning	3
CEE 424	Sustainable Const Methods	4
CEE 434	Environmental Systems I	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 458	Water Resources Field Methods	4
CEE 465	Design of Structural Systems	3

Code	Title	Hours
CEE 493	Sustainable Design Eng Tech	4
CEE 498	Special Topics (As approved)	3-4
MSE 489	Matl Select for Sustainability	3 or 4
UP 466	Energy & the Built Environment	4
UP 480	Sustainable Design Principles	2
Global Context Secondary		
Students must have taken CEE 340 and either CEE 330 or CEE 350 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 1 course from the Global Issues list below:		
ACE 451	Agriculture in Intl Dev	3 to 4
ATMS 421	Earth Systems Modeling	4
CEE 438	Science & Environmental Policy	3
~~CEE 445~~	~~Course CEE 445 Not Found~~	
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4
CEE 447	Atmospheric Chemistry	4
CEE 450	Surface Hydrology	3
ECON 420	International Economics	3 to 4
~~Global CEE Design:~~		
Select 1 course from the CEE Global Design list below:		
CEE 408	Railroad Transportation Engrg	3
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
CEE 449	Environmental Engineering Lab	3
CEE 465	Design of Structural Systems	3
CEE Multidisciplinary Secondary		
Science Electives Recommended: Any recommended science electives from existing CEE Primary and Secondary listed above.		
Civil Engineering Core Courses Recommended: Core courses relevant to the student's interests.		
~~CHEM 222~~	~~Quantitative Analysis Lecture~~	~~2~~
Advanced Technical Courses: Students must work with CEE Academic Advisors to select courses.		
Atmospheric Science Secondary		
Students must have taken CEE 330 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 2 courses from list below:		
ATMS 302	Atmospheric Dynamics I	3
ATMS 410	Radar Remote Sensing	4
ATMS 411	Satellite Remote Sensing	4
ATMS 421	Earth Systems Modeling	4
~~CEE 445~~	~~Course CEE 445 Not Found~~	
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4
CEE 447	Atmospheric Chemistry	4
Chemical Engineering Secondary		
Students must have taken CEE 330 and CEE 350 to pursue this Secondary Field.		
Advanced Technical Courses		

Code	Title	Hours
Select 2 courses from list below:		
CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
Chemistry Secondary		
Students must have taken CEE 330 to pursue this Secondary Field.		
Advanced Technical Courses		
Select at least 2 courses from list below, a minimum of 6 credit hours required.		
CHEM 232	Elementary Organic Chemistry I	3 or 4
CHEM 315	Instrumental Chem Systems Lab	2
CHEM 332	Elementary Organic Chem II	4
CHEM 420	Instrumental Characterization	2
CHEM 440	Physical Chemistry Principles	4
Microbiology Secondary		
Students must have taken CEE 330 to pursue this Secondary Field.		
Advanced Technical Courses		
Select 2 courses from list below:		
CEE 444	Env Eng Principles, Biological	4
MCB 301	Experimental Microbiology	3
MCB 431	Microbial Physiology	3
MCB 450	Introductory Biochemistry	3
Toxicology Secondary		
Students must have taken CEE 330 to pursue this Secondary Field.		
~~GEOL 333~~	~~Earth Materials and the Env~~	~~4~~
~~GEOL 380~~	~~Environmental Geology~~	~~4~~
~~GEOL 401~~	~~Geomorphology~~	~~4~~
~~GEOL 411~~	~~Structural Geol and Tectonics~~	~~4~~
~~GEOL 440~~	~~Sedimentology and Stratigraphy~~	~~4~~
~~GEOL 470~~	~~Introduction to Hydrogeology~~	~~4~~
~~Civil Engineering Core Courses Required:~~		
Advanced Technical Courses		
Select 2 courses from list below:		
CHEM 332	Elementary Organic Chem II	4
ENVS 431	Environ Toxicology & Health	3
ENVS 480	Basic Toxicology	3
MCB 450	Introductory Biochemistry	3
The General Civil Engineering Option		37
Science Electives - Select 1 course from list below:		
GEOL 107	Physical Geology	4
~~CHEM 222~~	~~Quantitative Analysis Lecture~~	~~2~~
CHEM 232	Elementary Organic Chemistry I	3 or 4
ME 200	Thermodynamics	3
~~Science Electives Recommended - None~~		
~~Civil Engineering Core Courses Required:~~		

Code	Title	Hours
STAT 420	Methods of Applied Statistics	4
Civil Engineering Core Courses		
Select 7 courses from list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
~~CEE 330~~	~~Environmental Engineering~~	~~3~~
CEE 330	Environmental Engineering	3
~~Advanced Technical Courses Recommended:~~		
CEE 340	Energy and Global Environment	3
CEE 350	Water Resources Engineering	3
~~Advanced Technical Courses Recommended:~~		
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
~~Advanced Technical Courses Required:~~		
Advanced Technical Courses		
Select 4 courses from Areas below, following either of these two options: Option I: Pick no more than 1 course from each area below. Option II: Pick 2 courses from 1 area and no more than 1 course from each of the remaining areas.		
Construction		
CEE 420	Construction Productivity	3
~~Advanced Technical Courses Recommended:~~		
~~CEE 424~~	~~Sustainable Const Methods~~	~~4~~
CEE 421	Construction Planning	3
~~CEE 424~~	~~Sustainable Const Methods~~	~~4~~
CEE 422	Construction Cost Analysis	3
Environmental		
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 441	Air Pollution Sources, Transport and Control (Air Pollution Sources, Transport and Control)	4
Geotechnical		
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics	3 or 4
Materials		
CEE 401	Concrete Materials	4
Structures		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
Transportation		
CEE 405	Asphalt Materials I	3
CEE 406	Pavement Design I	3
CEE 407	Airport Design	3
CEE 408	Railroad Transportation Engrg	3
CEE 409	Railroad Track Engineering	3
CEE 410	Railway Signaling & Control	3

Code	Title	Hours
CEE 411	RR Project Design & Constr	3
~~CEE 412~~	~~High-Speed Rail Engineering~~	~~3 or 4~~
CEE 412	High-Speed Rail Engineering	3
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3
Water Resources		
CEE 451	Environmental Fluid Mechanics	3
CEE 453	Urban Hydrology and Hydraulics	4

Free Electives

Course List

Code	Title	Hours
~~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~~		~~6~~
Additional course work, subject to the Grainger College of Engineering restrictions to Free Electives, so that there are at least 128 credit hours earned toward the degree.		10
Total Hours of Curriculum to Graduate		128

~~secondary fields, of which there are seven traditional areas of study and three interdisciplinary programs. The specific choices of courses in this category are made through the submission of a Plan of Study, which is subject to approval by the faculty Program Review Committee.Electives~~

~~**1***CEE 190 is offered in the fall semester.***2***CEE 495 is offered in the fall and spring semesters.***3*** External transfer students take ENG 300.***4***~~

~~MATH 220%7C *may be substituted, with four of the five credit hours applying toward the degree.* MATH 220%7C *is appropriate for students with no background in calculus.*~~

~~***5****Math 284 or Math 286 (4 hours) are acceptable substitutes for MATH 285 (3 hours).***6***~~

~~*CEE 300 satisfies the General Education Advanced Composition requirement.***7***~~

~~*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.*~~

Corresponding Degree	BS Bachelor of Science

Program Features

Academic Level	Undergraduate
Does this major have transcripted concentrations?	No

What is the typical time to completion of this program?

4 years

What are the minimum Total Credit Hours required for this program?
128

CIP Code 140801 - Civil Engineering, General.

Is This a Teacher Certification Program?
No

Will specialized accreditation be sought for this program?

No

Delivery Method

This program is available:
On Campus - Students are required to be on campus, they may take some online courses.

Admission Requirements

Desired Effective Admissions Term: Fall 2021

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.
No Changes

Describe how critical academic functions such as admissions and student advising are managed.
No changes

Enrollment

Describe how this revision will impact enrollment and degrees awarded.

These changes will not affect enrollment

Estimated Annual Number of Degrees Awarded

Year One Estimate	5th Year Estimate (or when fully implemented)

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

Additional Budget Information

Attach File(s) ep22086_response from sponsor_20220214.pdf

Financial Resources

How does the unit intend to financially support this proposal?
No changes

Will the unit need to seek campus or other external resources?
No

Attach letters of support

What tuition rate do you expect to charge for this program? e.g, Undergraduate Base Tuition, or Engineering Differential, or Social Work Online (no dollar amounts necessary)

Are you seeking a change in the tuition rate or differential for this program?
No

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

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.

Attach File(s)

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.

These changes will not impact our faculty resources.

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.

There is no impact to the use of the Library collections, resources, and services.

EP Documentation

EP Control Number	EP.22.086
Attach Rollback/Approval Notices	ep22086_response from sponsor_20220214.pdf
This proposal requires HLC inquiry	No

DMI Documentation

Attach Final Approval Notices	
Banner/Codebook Name	BS:Civil Engineering -UIUC
Program Code:	10KP0106BS

Minor Code	Conc Code	Degree Code	BS	Major Code
0106				

Senate Approval Date	
Senate Conference Approval Date	

BOT Approval Date

IBHE Approval Date

HLC Approval Date

Effective Date:

Attached Document

Justification for this request

Program Reviewer Comments

Key: 113

Key														
GREEN HIGHLIGHT = Course addition or requirement replacement														
RED HIGHLIGHT = Course to be removed from listed requirements.														
Yellow Highlight - Revision to requirement														
CURRENT PROGRAM OF STUDY			**NEW PROGRAM OF STUDY**											
General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 or ECON 103). Specific Advanced Composition course required for this degree is listed below.			General education: Students must complete the Campus General Education requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 or ECON 103). CEE 300 will satisfy a Civil Engineering core course requirement and the Campus General Education Advanced Composition requirement.											
Minimum Overall GPA: 2.0			**Minimum Overall GPA: 2.0**											
Minimum Hours Required for Graduation: 128			**Minimum Hours Required for Graduation: 128**											
Current Requirement	Current Hours		Revised Requirements	**New Hours**										
Orientation and Professional Development	**4**		**Orientation and Professional Development**	**5**										
ENG 100: Engineering Orientation [3]	0		CEE 190: Project-Based Introduction to CEE	4										
CEE 190: Project-Based Introduction to CEE [1]	4		CEE 495: Professional Practice	0										
CEE 495: Professional Practice [2]	0		ENG 100: Engineering Orientation (External transfer students should take ENG 300)	1										
Foundational Mathematics and Science	**34**		**Foundational Mathematics and Science**	**35**										
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										
MATH 221: Calculus I [4]	4		MATH 221: Calculus I (MATH 220 may be substituted. MATH 220 is appropriate for students with no background in calculus. 4 of 5 credit hours count towards degree.)	4										
MATH 225: Matrix Theory	2													
MATH 231: Calculus II	3		MATH 231: Calculus II	3										
MATH 241: Calculus III	4		MATH 241: Calculus III	4										
			MATH 257: Linear Algebra with Computational Applications (MATH 225 or MATH 415 may be substituted.)	3										
MATH 285: Intro Differential Equations [5]	3		MATH 285: Intro Differential Equations (MATH 284 or MATH 286 may be substituted. Extra hour counts towards free electives)	3										
PHYS 211: University Physics: Mechanics	4		PHYS 211: University Physics: Mechanics	4										
PHYS 212: University Physics: Elec & Mag	4		PHYS 212: University Physics: Elec & Mag	4										
PHYS 213: Thermal Physics	2		PHYS 213: Thermal Physics	2										
Civil Engineering Technical Core	**25**		**Civil Engineering Technical Core**	**25**										
CEE 201: Systems Engrg & Economics	3		CEE 201: Systems Engrg & Economics	3										
CEE 202: Engineering Risk & Uncertainty	3		CEE 202: Engineering Risk & Uncertainty	3										
CS 101: Intro Computing: Engrg & Sci	3		CS 101: Intro Computing: Engrg & Sci	3										
SE 101: Engineering Graphics & Design	3		SE 101: Engineering Graphics & Design	3										
TAM 211: Statics	3		TAM 211: Statics	3										
TAM 212: Introductory Dynamics	3		TAM 212: Introductory Dynamics	3										
TAM 251: Introductory Solid Mechanics	3		TAM 251: Introductory Solid Mechanics	3										
TAM 335: Introductory Fluid Mechanics	4		TAM 335: Introductory Fluid Mechanics	4										
			or CEE 331: Fluid Dynamics in the Natural and Built Environment											
Science Elective	**3**													
ATMS 120: Severe & Hazardous Weather	3													
CHBE 321: Thermodynamics	4													
CHEM 222: Quantitative Analysis Lecture	2													
CS 357: Numerical Methods I	3													
ECE 205: Electrical and Electronic Circuits	3													
GEOL 107: Physical Geology	4													
GEOL 118: Natural Disasters	3													
ME 200: Thermodynamics	3													
Stat 420: Methods of Applied Statistics	3 or 4													
Civil Engineering Technical Electives	34													
Civil Engineering Core Courses	**15-16**													
CEE 300: Behavior of Materials [6]	4													
CEE 310: Transportation Engineering	3													
CEE 320: Construction Engineering	3													
CEE 330: Environmental Engineering	3													
CEE 340: Energy and Global Environment	3													
CEE 350: Water Resources Engineering	3													
CEE 360: Structural Engineering	3													
CEE 380: Geotechnical Engineering	3													
			Civil Engineering Primary and Secondary Fields											
			Students choose a primary and a secondary field of study, of which there are seven traditional areas of study and three interdisciplinary programs to choose from. The particular primary and secondary field selectons shape the selection of science electives, civil engineering core courses and advanced technical electives. The specific choices of courses in this category are made through the submission of a Plan of Study, which is subject to approval by the faculty Program Review Committee. Instead of choosing separate primary and secondary field options as listed below, students could select to pursue the General Civil Engineering Option. The General Civil Engineering Option offers a broader coverage of Civil Engineering topical areas. This option can be found below the Secondary Field list.											
			Primary Field. Students choose 1 primary field, in which they must take 1 science elective course (3-4 hours), 15-16 hours of 300 level Civil Engineering Core Courses from departmentally approved list, and 12-13 hours of 400 level Advanced Technical Electives from departmentally approved list.	**31**										
Primary Field Advanced Technical Electives	**12-13**													
Construction Engineering & Management			**Construction Engineering & Management Primary**											
Science Elective Required: None														
Science Electives Recommended - See below:			**Science Electives - Select 1 course from list below:**											
ATMS 120: Severe and Hazardous Weather	3		ATMS 120: Severe and Hazardous Weather	3										
ATMS 303: Synoptic-Dynamic Wea Analysis	4		ATMS 303: Synoptic-Dynamic Wea Analysis	4										
ECE 205: Electrical and Electronic Circuits	3		ECE 205: Electrical and Electronic Circuits	3										
FIN 221: Corporate Finance	3		FIN 221: Corporate Finance	3										
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4										
GEOL 118: Natural Disasters	3		GEOL 118: Natural Disasters	3										
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										
ME 200: Thermodynamics	3		ME 200: Thermodynamics	3										
NPRE 201: Energy Systems	2 or 3		NPRE 201: Energy Systems	3										
SE 400: Engineering Law	3 or 4		SE 400: Engineering Law	3 or 4										
STAT 420: Methods of Applied Statistics	3 or 4		STAT 420: Methods of Applied Statistics	3 or 4										
UP 205: Ecology & Environmental Sustainability	3		UP 205: Ecology & Environmental Sustainability	3										
Civil Engineering Core Courses:			**Civil Engineering Core Courses**											
			Required courses:											
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4										
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3										
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3										
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3										
Civil Engineering Core Courses Recommended- None														
			Select 1 course from list below:											
			CEE 310: Transportation Engineering	3										
			CEE 330: Environmental Engineering	3										
			CEE 340: Energy and Global Environment	3										
			CEE 350: Water Resources Engineering	3										
Advanced Technical Courses - Required:			**Advanced Technical Courses**											
			Required courses:											
CEE 420: Construction Productivity	3		CEE 420: Construction Productivity	3										
CEE 421: Construction Planning (Required Integrated Design Course)	3		CEE 421: Construction Planning (Required Integrated Design Course)	3										

CEE 422: Construction Cost Analysis	3		CEE 422: Construction Cost Analysis	3										
Advanced Technical Courses - Recommended:			Select remaining courses to fulfill this requirement from the list below:											
CEE 401: Concrete Materials	4		CEE 401: Concrete Materials	4										
CEE 424: Sustainable Const Methods	4													
CEE 460: Steel Structures I	3													
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3										
CEE 469: Wood Structures	3													
			CEE 498: Special Topics (As approved)	4										
			CEE 498: Special Topics (Construction Equipment Methods)	3										
Construction Materials Engineering			**Construction Materials Engineering Primary**											
Science Electives Required - None														
Science Electives Recommended:			**Science Electives - Select 1 course from list below:**											
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4										
MSE 201: Phases and Phase Relations	3		MSE 201: Phases and Phase Relations	3										
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**											
			Required courses:											
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4										
CEE 310 Transportation Engineering	3		CEE 310 Transportation Engineering	3										
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3										
Civil Engineering Core Courses Recommended:			Select 2 courses from list below:											
			CEE 320: Construction Enigneering	3										
			CEE 330: Environmental Engineering	3										
			CEE 340: Energy and Global Environment	3										
			CEE 350: Water Resources Engineering	3										
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3										
Advanced Technical Courses Required:			**Advanced Technical Courses**											
			Required courses:											
CEE 401: Concrete Materials (Required Integrated Design Course)	4		CEE 401: Concrete Materials (Required Integrated Design Course)	4										
CEE 405: Asphalt Materials I	3 or 4		CEE 405: Asphalt Materials I	3										
Advanced Technical Courses Recommended:			Select remaining courses to fulfill this requirement from the list below:											
CEE 406: Pavement Design I	3		CEE 406: Pavement Design I	3										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3										
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3										
CEE 469 Wood Structures	3		CEE 469 Wood Structures	3										
CEE 483 Soil Mechanics and Behavior	4		CEE 483 Soil Mechanics and Behavior	4										
MSE 420: Ceramic Materials and Properties	3													
ME 430: Failure of Engrg Materials	3		ME 430: Failure of Engrg Materials	3										
MSE 401: Thermodynamics of Materials	3		MSE 401: Thermodynamics of Materials	3										
MSE 402: Kinetic Processes in Materials	3		MSE 402: Kinetic Processes in Materials	3										
MSE 406: Thermal-Mech Behavior of Matls	3		MSE 406: Thermal-Mech Behavior of Matls	3										
MSE 450: Polymer Science & Engineering	3		MSE 450: Polymer Science & Engineering	3										
TAM 428: Mechanics of Composites	3		TAM 428: Mechanics of Composites	3										
Environmental Engineering			**Environmental Engineering Primary**											
Science Electives Required - None			Science Electives - Select 1 course from list below:											
Science Electives Recommended:														
CHEM 222: Quantitative Analysis Lecture	2													
CHEM 232: Elementary Organic Chemistry I	3 or 4		CHEM 232: Elementary Organic Chemistry I	3 or 4										
CS 357: Numerical Methods I	3		CS 357: Numerical Methods I	3										
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4										
MCB 300: Microbiology	3		MCB 300: Microbiology	3										
ME 200: Thermodynamics	3		ME 200: Thermodynamics	3										
MSE 401: Thermodynamics of Materials	3		MSE 401: Thermodynamics of Materials	3										
STAT 420: Methods of Applied Statistics	3 or 4		STAT 420: Methods of Applied Statistics	3 or 4										
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**											
			Required course:											
CEE 330 - Environmental Engineering	3		CEE 330 - Environmental Engineering	3										
Civil Engineering Core Courses Recommended:			Select 4 courses from list below:											
			CEE 300: Behavior of Materials	4										
			CEE 310 Transportation Engineering	3										
			CEE 320: Construction Enigneering	3										
			CEE 340: Energy and Global Environment	3										
CEE 350 - Water Resources Engineering	3		CEE 350 - Water Resources Engineering	3										
			CEE 360: Structural Engineering	3										
CEE 380 - Geotechnical Engineering	3		CEE 380 - Geotechnical Engineering	3										
Advanced Technical Courses Required - At least one of:			**Advanced Technical Courses**											
			Select 1 course from list below:											
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
CEE 440: Fate Cleanup Environ Pollutant	4		CEE 440: Fate Cleanup Environ Pollutant	4										
			CEE 441: Air Pollution Sources, Transport and Control	4										
CEE 445: Air Quality Modeling	4													
CEE 446: Air Quality Engineering	4													
Advanced Technical Course Recommended:			Select remaining courses to fulfill this requirement from the list below:											
CEE 430: Ecological Quality Engineering	2		CEE 430: Ecological Quality Engineering	2										
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3										
CEE 435: Public Health Engineereing	3		CEE 435: Public Health Engineereing	3										
CEE 438: Science & Environmental Policy	3		CEE 438: Science & Environmental Policy	3										
CEE 442: Environmental Engineering Principles, Physical	4		CEE 442: Environmental Engineering Principles, Physical	4										
CEE 443: Env Eng Principles, Chemical	4		CEE 443: Env Eng Principles, Chemical	4										
CEE 444: Env Eng Principles, Biological	4		CEE 444: Env Eng Principles, Biological	4										
CEE 445: Air Quality Modeling	4													
CEE 447: Atmospheric Chemistry	4		CEE 447: Atmospheric Chemistry	4										
CEE 449: Environmental Engineering Lab (Required Integrated Design Course)	3		CEE 449: Environmental Engineering Lab (Required Integrated Design Course)	3										
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 457: Groundwater	3		CEE 457: Groundwater	3										
			CEE 493: Sustainable Design of Engineered Technologies	4										
Geotechnical Engineering			**Geotechnical Engineering Primary**											
Science Elective Required:			**Science Elective required course:**											
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4										
Science Elective Recommended:														
GEOL 333: Earth Materials and the Env	4													
GEOL 380: Environmental Geology	4													
GEOL 401: Geomorphology	4													
GEOL 411: Structural Geol and Tectonics	4													
GEOL 440: Sedimentology and Stratigraphy	4													
GEOL 470: Introduction to Hydrogeology	4													
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**											
			Required courses:											
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3										
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3										
Civil Engineering Core Courses Recommended:			Select 3 courses from the list below:											
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4										
CEE 310: Transportation Engineering	3		CEE 310: Transportation Engineering	3										
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3										
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3										
			CEE 340: Energy and Global Environment	3										
CEE 350: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3										
Advanced Technical Courses Required:			**Advanced Technical Courses**											
			Required courses:											
CEE 483: Soil Mechanics and Behavior	4		CEE 483: Soil Mechanics and Behavior	4										
CEE 484: Applied Soil Mechanics (Required Integrated Design Course)	3 or 4		CEE 484: Applied Soil Mechanics (Required Integrated Design Course)	4										
Advanced Technical Courses Recommended:			Select remaining courses to fulfill this requirement from the list below:											
CEE 457: Groundwater	3		CEE 457: Groundwater	3										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3										
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3										
CEE 463: Reinforced Concrete II	3		CEE 463: Reinforced Concrete II	3										
			CEE 498 Special Topics (As approved)	3-4										
Structural Engineering			**Structural Engineering Primary**											
Science Elecitve Required: None														
Science Elecitve Recommended:			Science Electives - Select 1 course from list below:											

CS 357: Numerical Methods I	3		CS 357: Numerical Methods I	3									
ECE 205: Electrical and Electronic Circuits	3		ECE 205: Electrical and Electronic Circuits	3									
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4									
GEOL 118: Natural Disasters	3		GEOL 118: Natural Disasters	3									
ME 200: Thermodynamics	3		ME 200: Thermodynamics	3									
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**										
			Required courses:										
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4									
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3									
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3									
Civil Engineering Core Courses Recommended:			Select 2 courses from list below:										
			CEE 310: Transportation Engineering	3									
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3									
			CEE 330: Environmental Engineering	3									
			CEE 340: Energy and Global Environment	3									
			CEE 350: Water Resources Engineering	3									
Advanced Technical Courses Required:			**Advanced Technical Courses**										
			Required Courses:										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3									
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3									
CEE 465: Design of Structural Systems (Required Integrated Design Course)	3		CEE 465: Design of Structural Systems (Required Integrated Design Course)	3									
CEE 470: Structural Analysis	4		CEE 470: Structural Analysis	4									
Transportation Engineering			**Transportation Engineering Primary**										
Science Elecitve Required: None													
Science Elecitve Recommended:			Science Electives - Select 1 course from list below:										
CS 357: Numerical Methods I	3		CS 357: Numerical Methods I	3									
ECE 205: Electrical and Electronic Circuits	3		ECE 205: Electrical and Electronic Circuits	3									
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4									
ME 200: Thermodynamics	3		ME 200: Thermodynamics	3									
ME 340: Dynamics of Mechanical Systems	3.5		ME 340: Dynamics of Mechanical Systems	3.5									
MSE 401: Thermodynamics of Materials	3		MSE 401: Thermodynamics of Materials	3									
SE 320: Control Systems	4		SE 320: Control Systems	4									
STAT 420: Methods of Applied Statistics	3 or 4		STAT 420: Methods of Applied Statistics	3 or 4									
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**										
			Required courses:										
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4									
CEE 310: Trainsportation Engineering	3		CEE 310: Trainsportation Engineering	3									
Civil Engineering Core Courses Recommended:			Select 3 courses from the list below:										
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3									
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3									
			CEE 340: Energy and Environment	3									
CEE 350: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3									
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3									
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3									
Advanced Technical Courses: You must select one course from each of the three Areas below and one course from the recommended list.			**Advanced Technical Courses: Select 1 course from each of the 3 Areas below and 1 course from the recommended list.**										
Area 1 - Facilities			**Area 1 - Facilities**										
CEE 405: Asphalt Materials I	3		CEE 405: Asphalt Materials I	3									
CEE 406: Pavement Design I	3		CEE 406: Pavement Design I	3									
CEE 407: Airport Design	3		CEE 407: Airport Design	3									
Area 2 - Systems:			**Area 2 - Systems:**										
CEE 407: Airport Design	3		CEE 407: Airport Design	3									
CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4		CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4									
CEE 416: Traffic Capacity Analysis	3		CEE 416: Traffic Capacity Analysis	3									
CEE 418: Public Transportation Systems	3		CEE 418: Public Transportation Systems	3									
Area 3 - Railroad:			**Area 3 - Railroad:**										
CEE 408: Railroad Transportation Engrg	3		CEE 408: Railroad Transportation Engrg	3									
CEE 409: Railroad Track Engineering	3		CEE 409: Railroad Track Engineering	3									
CEE 410: Railway Signaling & Control	3		CEE 410: Railway Signaling & Control	3									
CEE 411: RR Project Design & Constr	3		CEE 411: RR Project Design & Constr	3									
Recommended:			**Advanced Technical Courses Recommended:**										
CEE 401: Concrete Materials	4		CEE 401: Concrete Materials	4									
CEE 405: Asphalt Materials I	3		CEE 405: Asphalt Materials I	3									
CEE 406: Pavement Design I	3		CEE 406: Pavement Design I	3									
CEE 407: Airport Design	3		CEE 407: Airport Design	3									
CEE 408 Railroad Transportation Engrg	3		CEE 408 Railroad Transportation Engrg	3									
CEE 409: Railroad Track Engineering	3		CEE 409: Railroad Track Engineering	3									
CEE 410: Railway Signaling & Control	3		CEE 410: Railway Signaling & Control	3									
CEE 411: RR Project Design & Constr	3		CEE 411: RR Project Design & Constr	3									
CEE 412: High Speed Rail Engineering	3		CEE 412: High Speed Rail Engineering	3									
CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4		CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4									
CEE 416: Traffic Capacity Analysis	3		CEE 416: Traffic Capacity Analysis	3									
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4									
CEE 418: Public Transportation Systems	3		CEE 418: Public Transportation Systems	3									
Water Resources Engineering and Science			**Water Resources Engineering and Science Primary**										
Science Electives Required: None													
Science Electives Recommended:			Science Electives - Select 1 course from list below:										
CS 357: Numerical Methods I	3		CS 357: Numerical Methods I	3									
GEOL 107: Physical Geology	4		GEOL 107: Physical Geology	4									
ME 200: Thermodynamics	3		ME 200: Thermodynamics	3									
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**										
			Required course:										
CEE 350: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3									
Civil Engineering Core Courses Recommended:			Select 4 courses from the list below:										
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4									
			CEE 310: Transportation Engineering	3									
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3									
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3									
			CEE 340: Energy and Environment	3									
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3									
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3									
Advanced Technical Courses Required (Choose one):			**Advanced Technical Courses**										
			Required courses - Select 1 from list below:										
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3									
CEE 453: Urban Hydrology and Hydraulics (Required Integrated Design Course)	4		CEE 453: Urban Hydrology and Hydraulics (Required Integrated Design Course)	4									
Advanced Technical Courses Recommended:			Select remaining courses to fulfill this requirement from the list below:										
CEE 432: Stream Ecology	3		CEE 432: Stream Ecology	3									
CEE 433: Water Technology and Policy	3		CEE 433: Water Technology and Policy	3									
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3									
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3									
CEE 450: Surface Hydrology	3		CEE 450: Surface Hydrology	3									
CEE 451; Environmental Fluid Mechanics	3		CEE 451; Environmental Fluid Mechanics	3									
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3									
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4									
CEE 457: Groundwater	3		CEE 457: Groundwater	3									
CEE 458: Water Resources Field Methods	4		CEE 458: Water Resources Field Methods	4									
CEE 498: Special Topics (Section EH)	1 to 4												
			CEE 459: Ecohydraulics	4									
Energy-Water-Environment Sustainability			**Energy-Water-Environment Sustainability Primary**										
Science Electives Required:			Science Electives - Select 1 course from list below:										
ME 200 Thermodynamics or	3		ME 200 Thermodynamics	3									
CHBE 321 Thermodynamics	4		CHBE 321 Thermodynamics	4									
Science Electives Recommended: None													
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**										
			Required course:										
CEE 340: Energy and Global Environment	3		CEE 340: Energy and Global Environment	3									
Civil Engineering Core Courses Recommended:			Select 4 courses from the list below:										
			CEE 300: Behavior of Materials	4									
			CEE 310: Transportation Engineering	3									
			CEE 320: Construction Engineering	3									
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3									

CEE 350: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3										
			CEE 360: Structural Engineering	3										
			CEE 380: Geotechnical Engineering	3										
			Advanced Technical Courses											
Advanced Technical Courses Required:			Required course:											
CEE 493: Sustainable Design Eng Tech (Must also select 3 courses from recommended list below)	4		CEE 493: Sustainable Design Eng Tech	4										
Advanced Technical Courses Recommended:			Select remaining courses to fulfill this requirement from the list below											
ABE 436: Renewable Energy Systems	3 or 4		ABE 436: Renewable Energy Systems	3 or 4										
CEE 433: Water Technology and Policy	3		CEE 433: Water Technology and Policy	3										
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3										
CEE 435: Public Health Engineering	3		CEE 435: Public Health Engineering	3										
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
			CEE 441: Air Pollution Sources Transport and Control	4										
CEE 446: Air Quality Engineering	4													
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3										
CEE 450: Surface Hydrology	3		CEE 450: Surface Hydrology	3										
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 457: Groundwater	3		CEE 457: Groundwater	3										
			CEE 459: Ecohydraulics	4										
			CEE 473: Wind Effects of Structures	4										
CEE 498: Special topics (Section DS)	4													
			CEE 492: Data Science for Civil and Environmental Engineering	4										
CEE 498: Special Topics (Section EH)	1 to 4													
CEE 498 Special Topics (Section GES)	4		CEE 498 (As approved)	4										
ENG 471: Seminar Energy & Sustain Engrg	1		ENG 471: Seminar Energy & Sustain Engrg	1										
ME 400: Energy Conversion Systems	3 or 4		ME 400: Energy Conversion Systems	3 or 4										
NPRE 402: Nuclear Power Engineering	3 or 4		NPRE 402: Nuclear Power Engineering	3 or 4										
NPRE 475: Wind Power Systems	3 or 4		NPRE 475: Wind Power Systems	3 or 4										
Societal Risk and Hazard Mitigation			**Societal Risk and Hazard Mitigation Primary**											
Science Electives Required: None														
Science Electives Recommended:			Science Electives - Select 1 course from list below:											
FIN 230: Introduction to Insurance	3		FIN 230: Introduction to Insurance	3										
GEOL 118: Natural Disasters	3		GEOL 118: Natural Disasters	3										
LAW 301: Introduction to Law	2 or 3		LAW 301: Introduction to Law	3										
NRES 287: Environment and Society	3		NRES 287: Environment and Society	3										
STAT 420: Methods of Applied Statistics	3 or 4		STAT 420: Methods of Applied Statistics	3 or 4										
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**											
			Required Course:											
CEE 340: Energy and Global Environment	3		CEE 340: Energy and Global Environment	3										
Civil Engineering Core Courses Recommended:			Select 4 courses from the list below:											
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4										
CEE 310: Transportation Engineering	3		CEE 310: Transportation Engineering	3										
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3										
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3										
CEE 340: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3										
CEE 360: Structural Engineering	3		CEE 360: Structural Engineering	3										
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3										
Advanced Technical Courses Required:			**Advanced Technical Courses**											
			Required Course:											
CEE 491: Decision and Risk Analysis (and select 3 from the recommended list below)	3		CEE 491: Decision and Risk Analysis	3										
Advanced Technical Courses Recommended:			Select remaining courses to fulfill this requirement from list below:											
CEE 406: Pavement Design I	3		CEE 406: Pavement Design I	3										
CEE 416: Traffic Capacity Analysis	3		CEE 416: Traffic Capacity Analysis	3										
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4										
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
CEE 440: Fate Cleanup Environ Pollutant	4		CEE 440: Fate Cleanup Environ Pollutant	4										
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3										
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3										
CEE 465: Design of Structural Systems	3		CEE 465: Design of Structural Systems	3										
CEE 472: Structural Dynamics I	3		CEE 472: Structural Dynamics I	3										
CEE 473: Wind Effects on Structures	4		CEE 473: Wind Effects on Structures	4										
IE 410: Advanced Topics in Stochastic Processes & Applications	3 or 4		IE 410: Advanced Topics in Stochastic Processes & Applications	3 or 4										
NPRE 442: Radioactive Waste Management	3		NPRE 442: Radioactive Waste Management	3										
SE 450: Decision Analysis I	3 or 4		SE 450: Decision Analysis I	3 or 4										
STAT 425: Statistical Modeling I	3 or 4		STAT 425: Statistical Modeling I	3 or 4										
STAT 429: Time Series Analysis	3 or 4		STAT 429: Time Series Analysis	3 or 4										
STAT 430: Topics in Applied Statistics	3 or 4		STAT 430: Topics in Applied Statistics	3 or 4										
UP 438: Disasters and Urban Planning	4		UP 438: Disasters and Urban Planning	4										
Sustainable and Resilient Infrastructure Systems			**Sustainable and Resilient Infrastructure Systems Primary**											
Science Electives Required: None														
Science Electives Recommended:			Science Electives - Select 1 course from list below:											
ATMS 120: Severe and Hazardous Weather	3		ATMS 120: Severe and Hazardous Weather	3										
CS 357: Numercial Methods I	3		CS 357: Numercial Methods I	3										
ENSU 300: Numerical Methods I	3		ENSU 300: Numerical Methods I	3										
ESE 140: Climate and Global Change	3		ESE 140: Climate and Global Change	3										
ESE 320: Water Planet, Water Crisis	3		ESE 320: Water Planet, Water Crisis	3										
ESE 482: Challenges of Sustainability	3		ESE 482: Challenges of Sustainability	3										
FIN 221: Corporate Finance	3		FIN 221: Corporate Finance	3										
GEOG 103: Earth's Physical Systems	4													
			GGIS 103: Earth's Physical Systems	4										
NPRE 201: Energy Systems	2 or 3		NPRE 201: Energy Systems	3										
NRES 439: Env and Sustainable Dev	3		NRES 439: Env and Sustainable Dev	3										
SE 320: Control Systems	4		SE 320: Control Systems	4										
STAT 420: Methods of Applied Statistics	3 or 4		STAT 420: Methods of Applied Statistics	3 or 4										
UP 406: Urban Ecology	4		UP 406: Urban Ecology	4										
Civil Engineering Core Courses Required:			**Civil Engineering Core Courses**											
			Required Course:											
CEE 340: Energy and Global Environment	3		CEE 340: Energy and Global Environment	3										
Civil Engineering Core Courses Recommended:			Select 4 courses from the list below:											
CEE 300: Behavior of Materials	4		CEE 300: Behavior of Materials	4										
CEE 310: Transportation Engineering	3		CEE 310: Transportation Engineering	3										
CEE 320: Construction Engineering	3		CEE 320: Construction Engineering	3										
CEE 330: Environmental Engineering	3		CEE 330: Environmental Engineering	3										
CEE 350: Water Resources Engineering	3		CEE 350: Water Resources Engineering	3										
			CEE 360: Structural Engineering	3										
CEE 380: Geotechnical Engineering	3		CEE 380: Geotechnical Engineering	3										
Advanced Technical Courses Required:			**Advanced Technical Courses**											
			Required Course:											
CEE 491: Decision and Risk Analysis (and select 3 from the recommended list below)	3		CEE 491: Decision and Risk Analysis	3										
			Select remaining courses to fulfill this requirement from the list below											
ABE 436: Renewable Energy Systems	3 or 4		ABE 436: Renewable Energy Systems	3 or 4										
CEE 401: Concrete Materials	4		CEE 401: Concrete Materials	4										
CEE 406: Pavement Design I	3		CEE 406: Pavement Design I	3										
CEE 408: Railroad Transportation Engrg	3		CEE 408: Railroad Transportation Engrg	3										
CEE 409: Railroad Track Engineering	3		CEE 409: Railroad Track Engineering	3										
CEE 416: Traffic Capacity Analysis	3		CEE 416: Traffic Capacity Analysis	3										
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4										
CEE 418: Public Transportation Systems	3		CEE 418: Public Transportation Systems	3										
CEE 421: Construction Planning	3		CEE 421: Construction Planning	3										
CEE 424: Sustainable Const Methods	4		CEE 424: Sustainable Const Methods	4										
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 458: Water Resources Field Methods	4		CEE 458: Water Resources Field Methods	4										
CEE 465: Design of Structural Systems	3		CEE 465: Design of Structural Systems	3										
CEE 493: Sustainable Design Eng Tech	4		CEE 493: Sustainable Design Eng Tech	4										
Special Topics (Section PS)	1 to 4		CEE 498: Special Topics (As approved)	3-4										
MSE 489: Matl Select for Sustainability	3 or 4		MSE 489: Matl Select for Sustainability	3 or 4										
UP 466: Energy & the Built Environment	4		UP 466: Energy & the Built Environment	4										
UP 480: Sustainable Design Principles	2		UP 480: Sustainable Design Principles	2										
The General Civil Engineering Option														

Science Electives Required - Choose one course from recommended list below:													
Science Electives Recommended:													
GEOL 107: Physical Geology	4												
CHEM 222: Quantitative Analysis Lecture	2												
CHEM 232: Elementary Organic Chemistry I	3 or 4												
ME 200: Thermodynamics	3												
STAT 420: Statistics and Probability I	4												
Civil Engineering Core Courses Required - Should take 7 courses from list below:													
CEE 300: Behavior of Materials	4												
CEE 310: Transportation Engineering	3												
CEE 320: Construction Engineering	3												
CEE 330: Environmental Engineering	3												
CEE 340: Energy and Global Environment	3												
CEE 350: Water Resources Engineering	3												
CEE 360: Structural Engineering	3												
CEE 380: Geotechnical Engineering	3												
Advanced Technical Courses Required - Option I: Pick no more than one course from each area below such that the sum of the core and advanced courses is at least 34 credit hours. Option II: Pick 2 courses from one area and no more than one course from each of the remaining areas to total 34 credit hours.													
Construction:													
CEE 420: Construction Productivity	3 or 4												
CEE 421: Construction Planning	3 or 4												
CEE 422: Construction Cost Analysis	3 or 4												
Environmental													
CEE 437: Water Quality Engineering	3												
CEE 440: Fate Cleanup Environ Pollutant	4												
CEE 446: Air Quality Engineering	4												
Geotechnical													
CEE 483: Soil Mechanics and Behavior	4												
CEE 484: Applied Soil Mechanics	3 or 4												
Materials													
CEE 401: Concrete Materials	4												
Structures													
CEE 460: Steel Structures I	3												
CEE 461: Reinforced Concrete I	3												
Transportation													
CEE 405: Asphalt Materials I	3 or 4												
CEE 406: Pavement Design I	3 or 4												
CEE 407: Airport Design	3 or 4												
CEE 408 Railroad Transportation Engrg	3 or 4												
CEE 409: Railroad Track Engineering	3 or 4												
CEE 410: Railway Signaling & Control	3 or 4												
CEE 411: RR Project Design & Constr	3 or 4												
CEE 412: High Speed Rail Engineering	3 or 4												
CEE 415: Geometric Design of Roads	4												
CEE 416: Traffic Capacity Analysis	3 or 4												
CEE 417: Urban Transportation Planning	4												
CEE 418: Public Transportation Systems	3 or 4												
Water Resources													
CEE 452: Hydraulic Analysis and Design	3												
CEE 453: Urban Hydrology and Hydraulics	4												
Secondary Field Advanced Technical Electives Select courses from approved lists to complement the primary area and add breadth to the program of study. See list below:			**Secondary Field. S**tudents choose 1 secondary field that is different from but complements and adds breadth to their primary field selection. This should be done in consultation with academic advisor. See list of classes for each area of study below.	**6**									
Construction Engineering and Management			**Construction Engineering & Management Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 320 to pursue this Secondary Field.										
CEE 320: Construction Engineering Management	3												
Advanced Technical Courses Required:			**Advanced Technical Courses**										
			Required course:										
CEE 421: Construction Planning	3 or 4		CEE 421: Construction Planning (Required Integrated Design Course)	3									
			Select 1 course from list below										
CEE 420 Construction Productivity	3 or 4		CEE 420: Construction Productivity	3									
or CEE 422: Construction Cost Analysis	3 or 4		CEE 422: Construction Cost Analysis	3									
Advanced Technical Courses Recommended:													
CEE 424: Sustainable Const Methods	4												
Construction Materials Engineering			**Construction Materials Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 300 to pursue this Secondary Field.										
CEE 300: Behavior of Materials	4												
Advanced Technical Courses Required - Pick 2 courses from the recommended list below:			**Advanced Technical Courses**										
Advanced Technical Courses Recommended:			Select 2 courses from list below										
CEE 401: Concrete Materials	4		CEE 401: Concrete Materials	4									
CEE 405: Asphalt Materials I	3 or 4		CEE 405: Asphalt Materials I	3									
CEE 406: Pavement Design I	3 or 4		CEE 406: Pavement Design I	3									
Environmental Engineering			**Environmental Engineering Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 330 to pursue this Secondary Field.										
CEE 330: Environmental Engineering	3		**Advanced Technical Courses**										
Advanced Technical Courses Required - Choose 2 courses from the recommended list below:			Select at least 2 courses from list below, a minimum of 6 credit hours required.										
CEE 430: Ecological Quality Engineering	2		CEE 430: Ecological Quality Engineering	2									
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3									
CEE 435: Public Health Engineering	3 or 4		CEE 435: Public Health Engineering	3									
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3									
CEE 438: Science & Environmental Policy	3		CEE 438: Science & Environmental Policy	3									
CEE 445: Course Not Found													
			CEE 441: Air Pollution Sources Transport and Control	4									
CEE 442: Environmental Engineering Principles, Physical	4		CEE 442: Environmental Engineering Principles, Physical	4									
CEE 443: Env Eng Principles, Chemical	4		CEE 443: Env Eng Principles, Chemical	4									
CEE 444: Env Eng Principles, Biological	4		CEE 444: Env Eng Principles, Biological	4									
CEE 447: Atmospheric Chemistry	4		CEE 447: Atmospheric Chemistry	4									
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3									
Geotechnical Engineering			**Geotechnical Engineering Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 380 to pursue this Secondary Field.										
CEE 380: Geotechnical Engineering	3												
Advanced Technical Courses Required:			**Advanced Technical Courses**										
			Required course:										
CEE 483: Soil Mechanics and Behavior	4												
CEE 484: Applied Soil Mechanics	3 or 4		CEE 484: Applied Soil Mechanics	3									
Advanced Technical Courses Recommended - None			Select 1 course from list below:										
			CEE 483: Soil Mechanics and Behavior	4									
			CEE 498 Special Topics (As approved)	3-4									
Structural Engineering			**Structural Engineering Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 360 to pursue this Secondary Field.										
CEE 360: Structural Engineering	3												
Advanced Technical Courses Required:			**Advanced Technical Courses**										
			Required courses:										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3									
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3									
Transportation Engineering			**Transportation Engineering Secondary**										
Civil Engineering Core Courses Required:			Students must have taken CEE 310 to pursue this Secondary Field.										
CEE 310: Transportation Engineering	3												
Advanced Technical Courses Required: Select 2 courses, each from a different Area			**Advanced Technical Courses**										
			Select 2 courses, each from a different area listed below:										
Area 1 - Facilities			**Area 1 - Facilities**										
CEE 405: Asphalt Materials I	3 or 4		CEE 405: Asphalt Materials I	3									

CEE 406: Pavement Design I	3 or 4		CEE 406: Pavement Design I	3										
CEE 407: Airport Design	3 or 4		CEE 407: Airport Design	3										
Area 2 - Systems:			**Area 2 - Systems:**											
CEE 407: Airport Design	3 or 4		CEE 407: Airport Design	3										
CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4		CEE 415: Geometric Design of Roads (Required Integrated Design Course)	4										
CEE 416: Traffic Capacity Analysis	3 or 4		CEE 416: Traffic Capacity Analysis	3										
CEE 418: Public Transportation Systems	3 or 4		CEE 418: Public Transportation Systems	3										
Area 3 - Railroad:			**Area 3 - Railroad:**											
CEE 408: Railroad Transportation Engrg	3 or 4		CEE 408: Railroad Transportation Engrg	3										
CEE 409: Railroad Track Engineering	3 or 4		CEE 409: Railroad Track Engineering	3										
CEE 410: Railway Signaling & Control	3 or 4		CEE 410: Railway Signaling & Control	3										
CEE 411: RR Project Design & Constr	3 or 4		CEE 411: RR Project Design & Constr	3										
CEE 412: High Speed Rail Engineering	3 or 4		CEE 412: High Speed Rail Engineering	3										
Water Resource Engineering and Science			**Water Resource Engineering and Science Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 350 to pursue this Secondary Field.											
CEE 350: Water Resources Engineering	3													
Advanced Technical Courses Required: 2 courses from the recommended list below:			**Advanced Technical Courses**											
Advanced Technical Courses Recommended:			Select 2 courses from list below											
CEE 432: Stream Ecology	3 or 4		CEE 432: Stream Ecology	3										
CEE 433: Water Technology and Policy	3 or 4		CEE 433: Water Technology and Policy	3										
CEE 450: Surface Hydrology	3		CEE 450: Surface Hydrology	3										
CEE 451; Environmental Fluid Mechanics	3		CEE 451; Environmental Fluid Mechanics	3										
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 457: Groundwater	3		CEE 457: Groundwater	3										
CEE 458: Water Resources Field Methods	4		CEE 458: Water Resources Field Methods	4										
CEE 498: Special Topics (Section EH)	1 to 4													
			CEE 459: Ecohydraulics	4										
Energy Water Environment Sustainability			**Energy Water Environment Sustainability Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 340 to pursue this Secondary Field.											
CEE 340: Energy and Global Environment	3		**Advanced Technical Courses**											
Advanced Technical Courses Required:			Required Course:											
CEE 493: Sustainable Design Eng Tech (and select one course from the recommended list below:)	4		CEE 493: Sustainable Design Eng Tech	4										
Advanced Technical Courses Recommended			Select 1 course from the list below:											
ABE 436: Renewable Energy Systems	3 or 4		ABE 436: Renewable Energy Systems	3 or 4										
ARCH 441: Heat and Moisture in Buildings	3													
CEE 424: Sustainable Const Methods	4													
CEE 433: Water Technology and Policy	3 or 4		CEE 433: Water Technology and Policy	3										
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3										
			CEE 435: Public Health Engineering	3										
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
			CEE 441: Air Pollution Sources Transport and Control	4										
CEE 446: Air Quality Engineering	4													
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3										
CEE 450: Surface Hydrology	3		CEE 450: Surface Hydrology	3										
CEE 452: Hydraulic Analysis and Design	3		CEE 452: Hydraulic Analysis and Design	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 457: Groundwater	3		CEE 457: Groundwater	3										
			CEE 459: Ecohydraulics	4										
			CEE 473: Wind Effects of Structures	4										
			CEE 492: Data Science for Civil and Environmental Engineering	4										
			CEE 498: Special Topics (As approved)	3-4										
CEE 498: Special Topics (Section EH)	1 to 4													
ENG 471: Seminar Energy & Sustain Engrg	1													
ME 400: Energy Conversion Systems	3 or 4		ME 400: Energy Conversion Systems	3 or 4										
NPRE 402: Nuclear Power Engineering	3 or 4		NPRE 402: Nuclear Power Engineering	3 or 4										
NPRE 475: Wind Power Systems	3 or 4		NPRE 475: Wind Power Systems	3 or 4										
Societal Risk and Hazard Mitigation			**Societal Risk and Hazard Mitigation Secondary**											
Civil Engineering Core Courses Required - None														
Advanced Technical Courses Required:			**Advanced Technical Courses**											
			Required Course:											
CEE 491 Decision and Risk Analysis	3 or 4		CEE 491 Decision and Risk Analysis	3										
Advanced Technical Courses Recommended:			Select 1 course from the list below:											
CEE 406: Pavement Design I	3 or 4		CEE 406: Pavement Design I	3										
CEE 416: Traffic Capacity Analysis	3 or 4		CEE 416: Traffic Capacity Analysis	3										
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4										
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
CEE 440: Fate Cleanup Environ Pollutant	4		CEE 440: Fate Cleanup Environ Pollutant	4										
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3										
CEE 460: Steel Structures I	3		CEE 460: Steel Structures I	3										
CEE 461: Reinforced Concrete I	3		CEE 461: Reinforced Concrete I	3										
CEE 465: Design of Structural Systems	3		CEE 465: Design of Structural Systems	3										
CEE 472: Structural Dynamics I	3 or 4		CEE 472: Structural Dynamics I	3										
CEE 473: Wind Effects on Structures	4		CEE 473: Wind Effects on Structures	4										
IE 410: Advanced Topics in Stochastic Processes & Applications	3 or 4		IE 410: Advanced Topics in Stochastic Processes & Applications	3 or 4										
NPRE 442: Radioactive Waste Management	3		NPRE 442: Radioactive Waste Management	3										
SE 450: Decision Analysis I	3 or 4		SE 450: Decision Analysis I	3 or 4										
STAT 425: Statistical Modeling I	3 or 4		STAT 425: Statistical Modeling I	3 or 4										
STAT 429: Time Series Analysis	3 or 4		STAT 429: Time Series Analysis	3 or 4										
STAT 430: Topics in Applied Statistics	3 or 4		STAT 430: Topics in Applied Statistics	3 or 4										
UP 438: Disasters and Urban Planning	4		UP 438: Disasters and Urban Planning	4										
Sustainable and Reslilient Infrastructure Systems			**Sustainable and Reslilient Infrastructure Systems Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 340 to pursue this Secondary Field.											
CEE 340: Energy and Global Environment	3													
Civil Engineering Core Courses Recommended:														
CEE 300: Behavior of Materials	4													
CEE 310: Transportation Engineering	3													
CEE 320: Construction Engineering	3													
CEE 330: Environmental Engineering	3													
CEE 350: Water Resources Engineering	3													
CEE 380: Geotechnical Engineering	3		**Advanced Technical Courses**											
Advanced Technical Courses Required:			Required Course											
CEE 491: Decision and Risk Analysis (And select one course form the recommended list below:)	3 or 4		CEE 491 Decision and Risk Analysis	3										
Advanced Technical Courses Recommended:			Select 1 course from the list below:											
ABE 436: Renewable Energy Systems	3 or 4		ABE 436: Renewable Energy Systems	3 or 4										
CEE 401: Concrete Materials	4		CEE 401: Concrete Materials	4										
CEE 406: Pavement Design I	3 or 4		CEE 406: Pavement Design I	3										
CEE 408: Railroad Transportation Engrg	3 or 4		CEE 408: Railroad Transportation Engrg	3										
CEE 409: Railroad Track Engineering	3 or 4		CEE 409: Railroad Track Engineering	3										
CEE 416: Traffic Capacity Analysis	3		CEE 416: Traffic Capacity Analysis	3										
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4										
CEE 418: Public Transportation Systems	3 or 4		CEE 418: Public Transportation Systems	3										
CEE 421: Construction Planning	3 or 4		CEE 421: Construction Planning	3										
CEE 424: Sustainable Const Methods	4		CEE 424: Sustainable Const Methods	4										
CEE 434: Environmental Systems I	3		CEE 434: Environmental Systems I	3										
CEE 453: Urban Hydrology and Hydraulics	4		CEE 453: Urban Hydrology and Hydraulics	4										
CEE 458: Water Resources Field Methods	4		CEE 458: Water Resources Field Methods	4										
CEE 465: Design of Structural Systems	3		CEE 465: Design of Structural Systems	3										
CEE 493: Sustainable Design Eng Tech	4		CEE 493: Sustainable Design Eng Tech	4										
CEE 498: Special Topics (Section PS)	1 to 4		CEE 498: Special Topics (As approved)	3 to 4										
MSE 489: Matl Select for Sustainability	3 or 4		MSE 489: Matl Select for Sustainability	3 or 4										
UP 466: Energy & the Built Environment	4		UP 466: Energy & the Built Environment	4										
UP 480: Sustainable Design Principles	2		UP 480: Sustainable Design Principles	2										
Global Context			**Global Context Secondary**											
Science Electives Recommended:														
CPSC 116: The Global Food Production Web	3													
ESE 140: Climate and Global Change	3													
ESE 320: Water Planet, Water Crisis	3													

ESE 482: Challenges of Sustainability	3													
Civil Engineering Core Courses Recommended:			Students must have taken CEE 340 and either CEE 330 or CEE 350 to pursue this Secondary Field.											
CEE 330: Environmental Engineering or	3													
CEE 350: Water Resources Engineering														
CEE 340: Energy and Global Environment														
Advanced Technical Courses Recommended: Must take at least 3 credit hours in each of the 2 areas below:														
Knowledge and Skills Needed to Effectively Address Global Issues:			**Advanced Technical Courses**											
			Select 1 course from the Global Issues list below:											
ACE 451: Agriculture in Intl Dev	3 to 4		ACE 451: Agriculture in Intl Dev	3 to 4										
ATMS 421: Earth Systems Modeling	4		ATMS 421: Earth Systems Modeling	4										
CEE 438: Science & Environmental Policy	3		CEE 438: Science & Environmental Policy	3										
CEE 445: Air Quality Modeling	4													
			CEE 441: Air Pollution Sources, Transport and Control	4										
CEE 447: Atmospheric Chemistry	4		CEE 447: Atmospheric Chemistry	4										
CEE 450: Surface Hydrology	3		CEE 450: Surface Hydrology	3										
ECON 420: International Economics	2 to 4		ECON 420: International Economics	3 to 4										
CEE Global Design			Select 1 course from the CEE Global Design list below:											
CEE 408: Railroad Transportation Engrg	3 or 4		CEE 408: Railroad Transportation Engrg	3										
CEE 417: Urban Transportation Planning	4		CEE 417: Urban Transportation Planning	4										
CEE 437: Water Quality Engineering	3		CEE 437: Water Quality Engineering	3										
CEE 449: Environmental Engineering Lab	3		CEE 449: Environmental Engineering Lab	3										
CEE 465: Design of Structural Systems	3		CEE 465: Design of Structural Systems	3										
CEE Multidisciplinary			**CEE Multidisciplinary Secondary**											
Science Electives Recommended: Any recommended science electives from existing CEE Primary and Secondary listed above			**Science Electives Recommended: Any recommended science electives from existing CEE Primary and Secondary listed above**											
Civil Engineering Core Courses Recommended: Core courses relevant to the student's interests			**Civil Engineering Core Courses Recommended: Core courses relevant to the student's interests**											
Advanced Technical Courses: Students work with CEE Academic Advisors			**Advanced Technical Courses: Students must work with CEE Academic Advisors to select courses.**											
Atmosphere Science (Primary Field: Environmental Engineering)			**Atmospheric Science Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 330 to pursue this Secondary Field.											
CEE 330: Environmental Engineering	3													
Advanced Technical Courses Recommended:			Advanced Technical Courses											
			Select 2 courses from list below:											
ATMS 302: Atmospheric Dynamics I	3		ATMS 302: Atmospheric Dynamics I	3										
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 421: Earth Systems Modeling	4		ATMS 421: Earth Systems Modeling	4										
			CEE 441: Air Pollution Sources, Transport and Control	4										
CEE 445: Air Quality Modeling	4													
CEE 447: Atmospheric Chemistry	4		CEE 447: Atmospheric Chemistry	4										
Chemical Engineering (Primary Field: Environmental Engineering)			**Chemical Engineering Secondary**											
Civil Engineering Core Courses Required:			**Students must have taken CEE 330 and CEE 350 to pursue this Secondary Field.**											
CEE 330: Evironmental Engineering	3													
CEE 350: Water Resources Engineering	3													
Advanced Technical Courses Recommended:			**Advanced Technical Courses**											
			Select 2 courses from list below:											
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										
Chemistry (Primary Field: Environmental Engineering)			**Chemistry Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 330 to pursue this Secondary Field.											
CEE 330: Environmental Engineering	3													
Advanced Technical Courses Recommended:			Advanced Technical Courses											
			Select at least 2 courses from list below, a minimum of 6 credit hours required.											
CHEM 232: Elementary Organic Chemistry I	3 or 4		CHEM 232: Elementary Organic Chemistry I	3 or 4										
CHEM 315: Instrumental Chem Systems Lab	2		CHEM 315: Instrumental Chem Systems Lab	2										
CHEM 332: Elementary Organic Chem II	4		CHEM 332: Elementary Organic Chem II	4										
CHEM 420: Instrumental Characterization	2		CHEM 420: Instrumental Characterization	2										
CHEM 440: Physical Chemistry Principles	4		CHEM 440: Physical Chemistry Principles	4										
Microbiology (Primary Field: Environmental Engineering)			**Microbiology Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 330 to pursue this Secondary Field.											
CEE 330: Evironmental Engineering	3													
Advanced Technical Courses Recommended:			Advanced Technical Courses											
			Select 2 courses from the list below:											
CEE 444: Env Eng Principles, Biological	4		CEE 444: Env Eng Principles, Biological	4										
MCB 301: Experimental Microbiology	3		MCB 301: Experimental Microbiology	3										
MCB 431: Microbial Physiology	3		MCB 431: Microbial Physiology	3										
MCB 450: Introductory Biochemistry	3		MCB 450: Introductory Biochemistry	3										
Toxicology (Primary Field: Environmental Engineering)			**Toxicology Secondary**											
Civil Engineering Core Courses Required:			Students must have taken CEE 330 to pursue this Secondary Field.											
CEE 330: Evironmental Engineering	3													
Advanced Technical Courses Recommended:			Advanced Technical Courses											
			Select 2 courses from the list below:											
CHEM 332: Elementary Organic Chem II	4		CHEM 332: Elementary Organic Chem II	4										
ENVS 431: Environ Toxicology & Health	3		ENVS 431: Environ Toxicology & Health	3										
ENVS 480: Basic Toxicology	3		ENVS 480: Basic Toxicology	3										
MCB 450: Introductory Biochemistry	3		MCB 450: Introductory Biochemistry	3										
			The General Civil Engineering Option	37										
			Science Electives - Select 1 course from list below:											
			GEOL 107: Physical Geology	4										
			CHEM 232: Elementary Organic Chemistry I	3 or 4										
			ME 200: Thermodynamics	3										
			STAT 420: Statistics and Probability I	4										
			Civil Engineering Core Courses											
			Select 7 courses from list below:											
			CEE 300: Behavior of Materials	4										
			CEE 310: Transportation Engineering	3										
			CEE 320: Construction Engineering	3										
			CEE 330: Environmental Engineering	3										
			CEE 340: Energy and Global Environment	3										
			CEE 350: Water Resources Engineering	3										
			CEE 360: Structural Engineering	3										
			CEE 380: Geotechnical Engineering	3										
			Advanced Technical Courses											
			Select 4 courses from areas below, following either of these two options: Option I: Pick no more than one course from each area below. Option II: Pick 2 courses from one area and no more than one course from each of the remaining areas.											
			Construction:											
			CEE 420: Construction Productivity	3										
			CEE 421: Construction Planning	3										
			CEE 422: Construction Cost Analysis	3										
			Environmental											
			CEE 437: Water Quality Engineering	3										
			CEE 440: Fate Cleanup Environ Pollutant	4										
			CEE 441: Air Pollution Sources, Transport and Control	4										
			Geotechnical											
			CEE 483: Soil Mechanics and Behavior	4										
			CEE 484: Applied Soil Mechanics	3 or 4										
			Materials											
			CEE 401: Concrete Materials	4										
			Structures											
			CEE 460: Steel Structures I	3										

			CEE 461: Reinforced Concrete I	3										
			Transportation											
			CEE 405: Asphalt Materials I	3										
			CEE 406: Pavement Design I	3										
			CEE 407: Airport Design	3										
			CEE 408 Railroad Transportation Engrg	3										
			CEE 409: Railroad Track Engineering	3										
			CEE 410: Railway Signaling & Control	3										
			CEE 411: RR Project Design & Constr	3										
			CEE 412: High Speed Rail Engineering	3										
			CEE 415: Geometric Design of Roads	4										
			CEE 416: Traffic Capacity Analysis	3										
			CEE 417: Urban Transportation Planning	4										
			CEE 418: Public Transportation Systems	3										
			Water Resources											
			CEE 452: Hydraulic Analysis and Design	3										
			CEE 453: Urban Hydrology and Hydraulics	4										
Electives			**Free Electives**											
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Eductaion Lists for Social and Behavioral Sciences or Humnities and the Arts [7]	6													
Free electives: Additional course work, subject to the Grainger College of Engineering restrictions to Free Electives, so that there are at least 128 credit hours earned toward the degree. [8]	6		Additional course work, subject to the Grainger College of Engineering restrictions to Free Electives, so that there are at least 128 credit hours earned toward the degree.	**10**										
Total Hours of Curriculum to Graduate	128		**Total Hours of Curriculum to Graduate**	128										
[1] CEE 190 is offered in the fall semester.														
[2] CEE 495 is offered in the fall and spring semesters.														
[3] External transfer students take ENG 300.														
[4] MATH 220%7C may be substituted, with four of the five credit hours applying toward the degree. MATH 220%7C is appropriate for students with no background in calculus.														
[5] Math 284 or Math 286 (4 hours) are acceptable substitutes for MATH 285 (3 hours).														
[6] CEE 300 satisfies the General Education Advanced Composition requirement.														
[7] 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.														

ILLINOIS

COLLEGE OF AGRICULTURAL, CONSUMER
& ENVIRONMENTAL SCIENCES

Office of the Dean
227 Mumford Hall, MC-710
1301 W. Gregory Drive
Urbana, IL 61801

January 13, 2022

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Germán Bollero, Interim Dean

ILLINOIS

COLLEGE OF APPLIED HEALTH SCIENCES

Office of the Dean
110 Huff Hall, MC-586
1206 S. Fourth St.
Champaign, IL 61820

January 25, 2022

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

While I support the move the give your students more freedom in course selection, it is important to express my concern that discontinuing your Liberal Education requirement may negatively impact my college's finances by reducing the IUs generated from lower enrollments in AHS courses. As you know, the current budget model rewards colleges financially based on the number of registrants in courses. I am hopeful that your students and advisors will continue to view AHS courses as relevant and valuable when they are selecting electives.

Sincerely,

Cheryl Hanley-Maxwell

Dean

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

College of Education
Undergraduate Student Academic Affairs Office
110 Education Building, MC-708
1310 S. Sixth St.
Champaign, IL 61820

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Assistant Dean for Academic Affairs
College of Education | University of Illinois at Urbana-Champaign

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

College of Fine & Applied Arts

Office of the Dean
100 Architecture Building, MC-622
608 E. Lorado Taft Dr.
Champaign, IL 61820

21 December 2021

Rashid Bashir, Dean
306 Engineering Hall
1308 W. Green St.
M/C 266
Urbana, IL 61801

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from the College of Fine & Applied Arts. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Kevin Hamilton
Dean and Professor

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

College of Liberal Arts & Sciences
2090 Lincoln Hall, MC-448
702 S. Wright St.
Urbana, IL 61801

December 20, 2021

Dear Dean Bashir,

Thank you for informing the College of LAS of the proposed removal of the Liberal Education requirement in all undergraduate programs in the Grainger College of Engineering. I understand that this requirement includes an extensive list of courses from which your students could choose some, many of which are from our college. Grainger Engineering students will continue to be welcome to take our courses formerly on your Liberal Education list as free electives after the removal of this requirement from their programs of study.

Sincerely,

Venetria K. Patton
Harry E. Preble Dean

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

College of Media
Office of the Dean
119 Gregory Hall, MC-462
810 S. Wright St.
Urbana, IL 61801

January 13, 2022

Rashid Bashir, Dean
The Grainger College of Engineering
306 Engineering Hall
1308 W. Green Street
Urbana, IL 61801

Dear Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from our college. Grainger Engineering students will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Tracy Sulkin
Dean, College of Media

Gies College of Business
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Office of the Dean
260 Wohlers Hall, 1206 S. 6th Street
Champaign, IL 61820
217.333.2747

December 13th, 2021

Dean Bashir,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in The Grainger College of Engineering. I understand that this requirement included an extensive list of courses Grainger Engineering students could choose from, including some from Gies College of Business. Students from Grainger will continue to be welcome to enroll in the courses formerly on your Liberal Education list as Free Electives after the removal of this requirement.

Sincerely,

Jeffrey R. Brown
Dean, Gies College of Business

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

School of Information Sciences

501 E. Daniel St., MC-493
Champaign, IL 61820-6211

February 3, 2022

Dean Rashid Bashir
306 Engineering Hall
1308 West Green Street
Urbana, IL 61801

Dear Rashid,

Thank you for informing us of the proposed removal of the Liberal Education requirements in all undergraduate programs in the Grainger College of Engineering. I understand that this requirement included an extensive list of courses that Grainger Engineering students could choose from, including some from the iSchool. This letter acknowledges that Grainger Engineering students will continue to be able to enroll in courses as articulated and constrained in Course Explorer and formerly on your Liberal Education list as Free Electives, after the removal of this requirement.

Sincerely,

Eunice Santos

Eunice Santos
Professor and Dean

ILLINOIS

THE GRAINGER COLLEGE OF ENGINEERING
Department of Mechanical Science & Engineering
144 Sidney Lu Mechanical Engineering Building, MC-244
1206 W. Green St.
Urbana, IL 61801

12 January, 2022

John S. Popovics
Professor and Associate Head and Director of Undergraduate Studies
Civil and Environmental Engineering

Dear Prof. Popovics,

The Department of Mechanical Science and Engineering acknowledges your notification on January 11 about the proposal for a new fluids course, CEE 331. MechSE expects to be impacted by the provision to allow BS degree students in Civil Engineering to optionally take the proposed course in lieu of TAM 335. MechSE has a long history of investments in TAM 335 including the laboratory. It is actively considering an infrastructure upgrade to the open channel flow components of TAM 335 laboratory, that is of interest primarily to the Civil Engineering students in the course. With the provision to make TAM 335 an option for Civil Engineering students, we anticipate a significant decrease in enrollment eventually, given anticipated student perceptions and the more fundamental orientation of TAM 335. We project that this will result in reduced IUs for MechSE and will impact our ability to make continued investment in the course.

Sincerely,

Sanjiv Sinha
Associate Head for Undergraduate Programs
Mechanical Science and Engineering

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mathematics

273 Altgeld Hall, MC-382
1409 West Green Street
Urbana, IL 61801

Re: Use of Math 257 in CEE

The Mathematics Department, working with the Grainger College of Engineering, has recently created the course MATH 257, *Linear Algebra with Computational Applications*. Quoting from the justification of the approved proposal, "In the future, MATH 257 will replace the MATH 415 requirement in many science and engineering curricula." With this in mind, the department would be pleased to have the Civil and Environmental Engineering department replace their current Math 225 requirement with MATH 257 instead. As the Mathematics department is reallocating instructional resources from both Math 225 and Math 415 to Math 257 as the need shifts, this will not cause any undue difficulties for Mathematics resources.

Sincerely

Randy McCarthy

Randy McCarthy
Professor of Mathematics
Dir of Undergraduate Studies in Math
rmccrthy@illinois.edu

telephone 217-333-3350 • *fax* 217-333-9576
email office@math.uiuc.edu • *url* http://www.math.uiuc.edu/

From: Hanley-Maxwell, Cheryl D <cherylhm@illinois.edu>
Sent: Monday, February 14, 2022 3:57 PM
To: Miller, Nolan H <nmiller@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

That's fine. Thanks for asking

CHERYL D HANLEY-MAXWELL
Dean

University of Illinois at Urbana-Champaign
College of Applied Health Sciences
108 Huff Hall
1206 S Fourth | M/C 586
Champaign, IL 61820
217.333.2131 | cherylhm@illinois.edu
www.ahs.illinois.edu
(217) 333-0404 (FAX)

Human kindness has never weakened the stamina or softened the fiber of a free people. A nation does not have to be cruel to be tough. -- President Franklin D. Roosevelt

From: Miller, Nolan H <nmiller@illinois.edu>
Sent: Monday, February 14, 2022 1:49 PM
To: Hanley-Maxwell, Cheryl D <cherylhm@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

Dear Cheryl,

Thanks again for talking with me about the changes to the Grainger BS programs. I read the statement you sent to the committee today. The Chair would like to include it in the record that is forwarded to the Senate. Is it ok to include the email you sent below?

Thanks,

Nolan

_____

NOLAN H MILLER
Daniel and Cynthia Mah Helle Professor in Finance | Department of Finance
Director, Center for Business and Public Policy
Gies College of Business | University of Illinois at Urbana-Champaign
217.244.2847 | nmiller@illinois.edu | http://www.business.illinois.edu/nmiller

From: Hanley-Maxwell, Cheryl D <cherylhm@illinois.edu>
Sent: Thursday, February 10, 2022 1:49 PM
To: Miller, Nolan H <nmiller@illinois.edu>
Subject: RE: Senate Ed Pol - Re: change to Grainger Liberal Education requirement

Hi Nolan –

I appreciate what Ed Pol does in juggling the interests and concerns of the various programs across the campus, while keeping the students in mind. I served on a committee like this at my previous institution and know that it all boils down to what is best for the students' learning. Thanks for reminding me of that.

Here is a statement: While the Grainger proposal has the potential to financially affect AHS, we want to affirm another college's right to control their program requirements and student experiences, ensuring the best possible outcomes for their students. As a result, AHS supports this proposal and hopes that Grainger advisors will recognize the valuable contribution AHS classes make to the education of their students and continue to encourage them to consider relevant and/or high interest classes in AHS.

Hope this works!

Cheryl

CHERYL D HANLEY-MAXWELL, PHD
Dean

University of Illinois at Urbana-Champaign
College of Applied Health Sciences
108 Huff Hall
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Human kindness has never weakened the stamina or softened the fiber of a free people. A nation does not have to be cruel to be tough. -- President Franklin D. Roosevelt