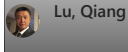


Civil Engineering Curriculum



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The Zhejiang University/University of Illinois Urbana-Champaign Institute (ZJU-UIUC Institute) offers a joint dual-degree engineering program. Upon successful completion of the program, and after meeting the graduation requirements of both universities, students will obtain bachelor's degrees separately from Zhejiang University (ZJU) and University of Illinois Urbana-Champaign (UIUC).

1. Overview

Civil engineering is a profession that applies the basic principles of science in conjunction with mathematical and computational tools to solve problems associated with developing and sustaining civilized life on our planet. Civil engineering works are generally one-of-a-kind projects; they are often grand in scale; and they usually require cooperation among professionals of many different disciplines. The completion of a civil engineering project involves the solution of technical problems in which uncertainty of information and myriad non-technical factors often play a significant role. Some of the most common examples of civil engineering works include bridges, buildings, dams, airports, highways, tunnels, and water distribution systems. Civil engineers are concerned with flood control, landslides, air and water pollution, and the design of facilities to withstand earthquakes and other natural hazards, in addition to protecting our environment for a sustainable future.

The Civil Engineering program comprises seven main areas (construction engineering and management, construction materials engineering, environmental engineering, geotechnical engineering, environmental hydrology and hydraulics, structural engineering, and transportation engineering) and three cross-cutting programs (**sustainable and resilient infrastructure systems; energy, water, and environmental sustainability; and societal risk management**). Although each area has its own special body of knowledge and engineering tools, they all rely on the same fundamental core principles. Civil engineering projects often draw on expertise from many of these areas and programs.

Our Education Objectives are to educate Civil Engineering students to:

1. Keep exploring new techniques and new knowledge for the sustainable development of human society.
2. 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 hydrologic engineering; construction management; or other related or emerging fields.
3. Pursue graduate education and research at major research universities in civil and environmental engineering, and related fields.
4. Pursue professional licensure and advance to leadership positions in the profession.
5. Engage in continued learning through professional development.
6. Participate in and contribute to professional societies and community services.

During their junior and senior years, students are encouraged to take courses and involve themselves in research projects in cross-disciplinary areas with Electrical Engineering, Mechanical Engineering, Computer Engineering, and others.

2. Graduation Requirement

1) Grade Point Average Requirement

A student must maintain a minimum GPA of 2.0 (A=4.0) to remain in good standing and graduate.

2) Junior Eligibility Requirement

To qualify for registration for the CEE courses shown in the third year of the curriculum, a student must have completed, with a combined 2.25 grade point average, the mathematics, physics, computer science, and civil engineering courses shown in the first two years.

3) Curriculum Requirement

The curriculum leading to the degree of Bachelor of Science in Civil Engineering from UIUC requires 128 hours and is organized into required courses and elective courses.

I. Required courses, see section 3 for details.	2016-2017	2018-2019	2020	2021	2022-
a) Orientation and Professional Development	4	4	2	5	5
b) Foundational Mathematics and Science	34	34	34	35	35
c) Technical Core	25	25	25	25	25
d) Composition	6	8	8	8	8
e) Advanced Composition*	3	4	4	4	4
Total required	72	75	73	77	77

II. Elective courses, see section 4 for details.					
a) Science Electives	3	3	3	3	3
b) Technical Electives	34	34	34	34	34
c) Liberal Education.	18	18	18	18	12
d) Free Electives	1	2	4		6
Total required:	56	57	59	55	55

**Students take CEE 300 to satisfy advance composition and technical elective requirement, and credits can be given for both.*

For UIUC degree, in addition to above specific course and scholastic average requirements, each candidate for a bachelor's degree from UIUC must satisfy following requirements:

- **Residency Requirement:** Earn a minimum 60 semester hours of UIUC credit, of which at least 21 hours must be 300 or 400 level UIUC credit courses.
- **Transfer Requirement:** Have a satisfactory English Proficiency Test score on TOEFL, IELTS or others approved by UIUC, and maintain a good standing on academic studies that all term GPAs, overall GPA on UIUC courses are suggested to be above 2.5, and get admission through transfer applications during junior year, changing status from non-degree student to degree student.

For ZJU degree, in addition to the 128-hour requirement listed above, the curriculum leading to the degree of Bachelor of Engineering from ZJU requires students to complete additional ZJU-required liberal education courses for domestic students and additional five courses in Chinese language and society study for international students. Please refer to section 5 for details.

3. Required Courses

3.1 Orientation and Professional Development

These courses introduce the opportunities and resources our institute and curriculum can offer you as you work to achieve your career goals. They also provide the skills to work effectively and successfully in the engineering profession, and the foundation for the study of civil engineering.

Course Code	Course Name	2016-2019	2020	2021-
CEE 195	About Civil Engineering	3	1	
CEE 190	Project Based Introduction to Civil Engineering			4
CEE 495	Professional Practice	0	0	0
ENG 100	Engineering Orientation	1	1	1
	Total required	4	2	5

3.2 Foundational Mathematics and Science

These courses stress the basic mathematical and scientific principles upon which the engineering discipline is based.

Course Code	Course Name	2016-2020	2021-
MATH 221	Calculus I	4	4
MATH 225*	Introductory Matrix Theory	2	
Math 257*	Linear Algebra with Computational Applications		3
MATH 231	Calculus II	3	3
MATH 241	Calculus III	4	4
MATH 285*	Intro to Differential Eq	3	3
CHEM 102	General Chemistry I	3	3
CHEM 103	General Chemistry Lab I	1	1
CHEM 104	General Chemistry II	3	3
CHEM 105	General Chemistry Lab II	1	1
PHYS 211	University Physics: Mechanics	4	4
PHYS 212	University Physics: Elec& Mag	4	4
PHYS 213	Univ Physics: Thermal Physics	2	2
	Total required	34	35

**Math 257 can be substituted by Math 415 (Applied Linear Algebra, 3 hours); Math 285 can be substituted by Math 286 (Introduction to Differential Equation Plus, 4 hours).*

3.3 Technical Core

These courses stress fundamental concepts and basic laboratory techniques that comprise the common intellectual understanding of civil engineering.

Course Code	Course Name	2016-
CS 101	Introduction to Computing: Engineering & Science	3
SE 101	Engineering Graphics & Design	3
CEE 201	Systems Engineering & Economics	3
CEE 202	Engineering Risk & Uncertainty	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 335	Introductory Fluid Mechanics	4
	Total required	25

3.4 Composition

The composition courses teach the fundamentals of expository writing.

Course Code	Course Name	2016-2017	2018-
RHET 101	Principles of Writing	3	4
RHET 102	Principles of Research	3	4
	Total required	6	8

3.5 Advanced Composition

The Advanced Composition requirement is fulfilled by a writing-intensive course beyond basic composition. It is normally taken in the junior or senior years.

Course Code	Course Name	2016-2017	2018-
BTW 261*	Principles Tech Comm	3	
CEE 300*	Behaviors of Materials		4
	Total required	3	4

**Satisfies the Advanced Composition requirement. BTW 261 can be substituted by CEE 300.*

4. Elective Courses

4.1 Science Electives

This elective allows the student to gain additional depth in science. The course should be selected according to the requirements and recommendations for the selected primary area of study in civil engineering, which is subject to approval by ZJUI and UIUC.

Course Code	Course Name	2016-
ATMS 120	Severe and Hazardous Weather	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4
CHBE 321	Thermodynamics	4
CHEM 232	Elementary Organic Chemistry I	3 or 4
CS 357	Numerical Methods I	3
ECE 110	Introduction to Electronics	3
ECE 205	Electrical and Electronic Circuits	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
FIN 230	Introduction to Insurance	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
GGIS 103	Earth's Physical Systems	4
LAW 301	Introduction to Law	3
MCB 300	Microbiology	3
ME 200	Thermodynamics	3
ME 340	Dynamics of Mechanical Systems	3.5
MSE 201	Phases and Phase Relations	3
MSE 401	Thermodynamics of Materials	3
NPRE 201	Energy Systems	3
NRES 287	Environment and Society	3
NRES 439	Env and Sustainable Dev	3
SE 320	Control Systems	4
SE 400	Engineering Law	3 or 4
STAT 420	Methods of Applied Statistics	3 or 4
UP 205	Ecology & Environmental Sustainability	3
UP 406	Urban Ecology	4
	Required total	3

4.2 Technical Electives

This course work is designed to give each student a broad background in the areas of civil engineering through the core courses and to allow each student to develop a focused program through advanced technical electives in chosen primary and secondary fields. Briefly, there are two types of civil engineering courses: (1) **core courses** and (2) **advanced technical courses**.

The core courses provide prerequisites for all of the advanced technical courses. The advanced technical courses are subdivided into a primary area of emphasis and a secondary area of emphasis. The core and secondary area courses assure adequate breadth in civil engineering subjects, while the primary area courses allow the student to study a certain subject in greater depth.

Students cannot use an advanced technical course to meet both primary and secondary requirements and each student must have **12 hours from the primary area and 6 hours from the secondary area. The sum of credit hours of core courses and technical electives must be at least 34.**

4.2.1 Core Courses

Dual degree students must select **at least 5 courses** from the following list. Students pursuing only ZJU degree may choose **four courses** instead.

Course Code	Course Name	2016-
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
	Total required	15

Core courses cannot be used as advanced technical courses.

4.2.2 Advanced Technical Electives

The advanced technical electives are selected to satisfy the requirements of a primary area of emphasis (i.e., a major field within civil engineering) and a secondary area of emphasis (i.e., a minor field within civil engineering). The program must have at least 12 hours in the primary field and 6 hours in the secondary field.

The courses in the primary area of emphasis are chosen to be an appropriate program of study within one of the ten disciplines of civil engineering: (1) construction engineering and management, (2) construction materials engineering, (3) environmental engineering, (4) geotechnical engineering, (5) structural engineering, (6) transportation engineering, (7) water resources engineering and science, (8) energy-water-environment sustainability, (9) societal risk management, and (10) sustainable and resilient infrastructure systems.

ZJUI students are recommended to choose: I. Environmental/Water Resources Engineering & Science (EWRES), II. Structural Engineering (STRUCTURES), III. Transportation Engineering (TRANSPORTATION) as primary areas.

The courses in the secondary area of emphasis are chosen to complement the primary area and add breadth to the program of study. Courses that make up a secondary area can be taken in one of the above three recommended areas of civil and environmental engineering, but there are also some additional options—CEE Multidisciplinary that give flexibility to the program. A secondary program cannot be taken in the same area as the primary. The secondary area requirement is meant to provide the student both with additional breadth and with an additional area of special focus.

1) Environmental Engineering

Environmental engineers have taken an increasingly important role in activities of the world in recent years, because of the problems related to air, land, and water contamination. Environmental engineers provide treatment facilities that render industrial and human wastes free from contaminants. They design, construct, and operate systems that purify water for drinking, industrial, and recreational uses. They also develop and implement air purification devices and models that describe the transport, and removal of contaminants in the atmosphere. Solid and hazardous waste management protocols are also developed and implemented by environmental engineers. Many environmental engineers develop plans and conduct research to solve problems related to our rapidly changing technological society and expanding human population.

a) Primary in Environmental Engineering

Science Elective

Required: *(Select one course from recommended list.)*

Recommended: ATMS 120, CHEM 222, CHEM 232, CS 357, GEOL 107, GEOL 118, MCB 300, ME 200, MSE 401, STAT 420

Core Courses

Required: CEE 300, CEE 330

Recommended: CEE 350, CEE 340, CEE 380

Advanced Technical Courses

Required: At least one of CEE 437, CEE 440, CEE 441

Recommended: CEE 430, CEE 434, CEE 435, CEE 438, CEE 442, CEE 443, CEE 444, CEE 447, CEE 449*, CEE 452, CEE 453, CEE 457, CEE 493

*CEE 449-Environmental Engineering Lab is the required Integrated Design course

b) Secondary in Environmental Engineering

Core Courses

Required: CEE 330

Advanced Technical Courses

Required: Two from the recommended list

2) Structural Engineering

Structural engineering involves the analysis, design, and construction of buildings, dams, bridges, and other types of facilities. A structural engineer designs economical structures that satisfy requirements of safety, utility, and durability; oversees the building of constructed facilities; and investigates the performance of structures that fail to perform as expected. The tools of the structural engineer include physical testing, mathematical modeling, and computer simulation. The structural engineer uses these tools to make decisions that aid in the creation, maintenance, or demolition of constructed facilities. The largest of structures, such as the Golden Gate Bridge, Hoover Dam, and Eiffel Tower, stand as monuments to the engineering achievements of humankind. The smallest of structures, such as thin films that contain computer circuitry, make possible many devices in our technologically sophisticated society.

a) Primary in Structural Engineering

Science Elective

Required: *(Select one course from recommended list.)*

Recommended: CS 357, ECE 110, ECE 205, GEOL 107, GEOL 118, ME 200

Core Courses

Required: CEE 300, CEE 360, CEE 380

Recommended: CEE 320

Advanced Technical Courses

Required: CEE 460, CEE 461, CEE 465*, CEE 470

Recommended: CEE472

**CEE 465-Design of Structural System is the required Integrated Design course*

b) Secondary in Structural Engineering

Core Courses

Required: CEE 360

Advanced Technical Courses

Required: CEE 460, CEE 461

Recommended: None

3) Transportation Engineering

Transportation engineers design, build, operate and maintain all types of facilities for railroads, automobiles, airplanes, and ships. They deal with the physical infrastructure of our transportation system, highways, ports, airports, and other facilities. They are involved in controlling traffic and in developing better transportation systems. Transportation engineers must understand the many factors that affect the long-term performance of the infrastructure from climatic factors imposed on it to the dynamics of the vehicles that use it. Transportation engineers are concerned with the development and operation of our multi-modal transportation system to meet the constantly changing social, economic, geographical, and political needs of society.

a) Primary in Transportation Engineering

Science Elective

Required: *(Select one course from recommended list.)*

Recommended: ATMS 120, CS 357, ECE 110, ECE 205, GEOL 107, GEOL 118, ME 200, ME 340, MSE 401, SE 320, STAT 420

Core Courses

Required: CEE 300, CEE 310

Recommended: CEE 320, CEE 330, CEE 350, CEE 360, CEE 380

Advanced Technical Courses

Required: Students must select one course from the each of the three Areas and one from the recommended list.

Area 1-Facilities: CEE 405, CEE 406

Area 2-Systems: CEE 407, CEE 415*, CEE 416, CEE 418

Area 3-Railroad: CEE 408, CEE 409, CEE 410, CEE 411

Recommended: CEE 401, CEE 405, CEE 406, CEE 408, CEE 409, CEE 410, CEE 411, CEE 412, CEE 415, CEE 416, CEE 417, CEE 418

**CEE 415-Geometric Design of Roads is the required Integrated Design course*

b) Secondary in Transportation Engineering

Core Courses

Required: CEE 310

Advanced Technical Courses

Required: Students must select two courses, each from a different Area.

Area 1-Facilities: CEE 405, CEE 406

Area 2-Systems: CEE 407, CEE 415, CEE 416, CEE 418

Area 3-Railroad: CEE 408, CEE 409, CEE 410, CEE 411, CEE 412

Recommended: None

4) Water Resources Engineering & Science

Water Resources Engineering and Science deals with surface and ground water used for human consumption, energy, food, transportation, and recreation, as well as mitigation of floods and other water related hazards. This area comprises the fields of hydrology, hydraulics, and water resources planning. Hydrology is the study of water in the natural environment. Hydraulics studies how to design infrastructure to manage water flow and storage. Water resources planning concerns how to manage water efficiently and economically under hydrologic, hydraulic, economic, and societal constraints. Engineers in this discipline are responsible for the planning, design, operation, and management of facilities for domestic, municipal, industrial and agricultural water supply, drainage, control, and utilization. Such facilities include river channel-dam-reservoir systems for flood control, hydropower, navigation, water supply, and recreation; water distribution networks, sewer systems and culverts for urban water supply and drainage; injection/extraction well systems for remediation of contaminated ground water, and erosion and sediment control structures. Water Resources Engineers are also involved in the planning, operation, and management of ground water, watersheds, and wetlands, as well as the hydrologic environment's response to human impacts and climatic changes.

a) Primary in Water Resources Engineering and Science

Science Elective

Required: *(Select one course from recommended list.)*

Recommended: ATMS 120, CS 357, GEOL 107, GEOL 118, ME 200

Core Courses

Required: CEE 300, CEE 350

Recommended: CEE 310, CEE 320, CEE 330, CEE 340, CEE 360, CEE 380

Advanced Technical Courses

Required: CEE 452 or CEE 453*

Recommended: CEE 432, CEE 433, CEE 434, CEE 437, CEE 450, CEE 451, CEE 452, CEE 453, CEE 457, CEE 458, CEE 459

**CEE 453-Urban Hydrology and Hydraulics is the required Integrated Design course*

b) Secondary in Water Resources Engineering and Science

Core Courses

Required: CEE 350

Advanced Technical Courses

Required: Two from the recommended list

Recommended: CEE 432, CEE 433, CEE 434, CEE 450, CEE 451, CEE 452, CEE 453, CEE 457, CEE 458, CEE 459

5) Additional Civil Engineering Secondaries

Secondary Area in CEE Multidisciplinary

The frontiers of CEE are becoming increasingly multidisciplinary, spanning sub-fields of CEE as well as other engineering and non-engineering fields. The purpose of this secondary is to provide students with interests that do not align with an existing secondary option to develop custom multidisciplinary programs in Mechanical Engineering, Electrical and Computer Engineering.

a) CEE Multidisciplinary – ECE

Required Science Elective – ECE 110

Required Core Course – ECE 210

Recommended Advanced Technical Electives – Two of ECE 310/311, ECE 329, ECE 333, ECE 437 & ECE 486

b) CEE Multidisciplinary – ME

Required Science Elective – ME 200

Required Core Course – ME 270

Required Advanced Technical Electives – Two of ME 340, ME 370, ME 371 & ME 430

6) List of Some Key CEE Advanced Technical Electives

Course Code	Course Name	Credits
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
CEE 408	Railroad Transportation Engineering	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Construction	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
CEE 420	Construction Productivity	3 or 4
CEE 421	Construction Planning	3 or 4
CEE 422	Construction Cost Analysis	3 or 4
CEE 424	Sustainable Const Methods	4
CEE 430	Ecological Quality Engineering	2
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 438	Science & Environmental Policy	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4

CEE 445	Air Quality Modeling	4
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab	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 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems	3
CEE 470	Structural Analysis	4
CEE 472	Structural Dynamics I	3 or 4
CEE 480	Foundation Engineering	3
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics	4
CEE 491	Decision and Risk Analysis	3 or 4
CEE 493	Sustainable Design Engineered Technologies	4
CEE 497	Independent Study	1 to 16
CEE 498	Special Topics	1 to 4
ECE 310	Digital Signal Processing	3
ECE 311	Digital Signal Processing Lab	1
ECE 329	Fields and Waves I	3
ECE 333	Green Electric Energy	3
ECE 437	Sensors and Instrumentation	3
ECE 486	Control Systems	4
ME 340	Dynamics of Mechanical Systems	3.5
ME 370	Mechanical Design I	3
ME 371	Mechanical Design II	3
ME 430	Failure of Engineering Materials	3 or 4

4.3 Liberal Education

The liberal education courses develop students' understanding of human culture and society, build skills of inquiry and critical thinking, and lay a foundation for civic engagement and lifelong learning. To satisfy the General Education requirements, students must take all courses for grade and complete courses based on the table below:

	2016-2017	2018-2019	2020-2021	2022-
1) Humanities & Arts (Two courses)	6	6	6	6
2) Social & Behavioral Sciences (Two courses)	6	6	6	6
3) Culture Studies				
Western/Comparative Culture(s) (One course)	3	3	3	3
Non-Western Culture(s) (One course)	3	3	3	3
U.S. Minority		3	3	3

	2016-2017	2018-2019	2020-2021	2022-
Culture(s) ¹ (One course)				
4) Aesthetic Education ² (One course)			3	3
Total required	18	18	18	12

¹Not required if students pursue ZJU degree only. ²Required only for ZJU degree.

One of the Social and Behavioral Science courses must be an introductory economics course ([ECON 102](#) or [ECON 103](#)).

Proper choices on Social and Behavioral Sciences and in Humanities and the Arts will assure that these courses also satisfy the requirements in the areas of Western, non-Western and US minority cultures.

4.4 Free Electives

These unrestricted electives give the student the opportunity to explore any intellectual area of unique interest. This freedom plays a critical role in helping students to define research specialties or to complete minors. Students are encouraged to take cross-discipline courses as free electives.

Free electives	2016-2017	2018-2020	2021	2022-
Total	1	2	0	6

5. ZJU Required Liberal Education

These courses introduce Chinese modern history, social development, government policies, etc., help students to improve their English and maintain a healthy lifestyle.

Domestic students must complete all courses below, which can be taught in Chinese, to fulfill the graduate requirement along with the above 128 credit hour courses towards the Bachelor of Engineering Degree at ZJU.

Course Code	Course Name	2016-2017	2018	2019	2020	2021	2022-
LAW1001	Mental Education and Foundation of Law	2.5	3	3	3		
LAW1002	Ideology, Morality and Rule of Law					3	3
HIST2001	Modern Chinese History	2.5	3	3	3	3	3
PHIL2001	Introduction to the Principle of Marxism	2.5	3	3	3		
PHIL2002	Introduction to the Principle of Marxism					3	3
PS2011	Intro.to Mao Thought & Theoretical System of China Socialism	4	5	5	5	5	3
PS3011	General Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era		2	2	2	2	3
PS1001	Situation and Policy I	1	1	1	1	1	1
PS2001	Situation and Policy II	1	1	1	1	1	1
ENGL1001	Integrated English I	4	4	1.5	1.5	1.5	1.5
ENGL1002	Integrated English II	2	2	1.5	1.5	1.5	1.5
ENGL2001	Advanced Spoken English I				1.5	1.5	1.5
ENGL2002	Advanced Spoken English II				1.5	1.5	1.5
PE1001	Physical Education I	1	1	1	1	1	1
PE1002	Physical Education II	1	1	1	1	1	1
PE2001	Physical Education III	1	1	1	1	1	1
PE2002	Physical Education IV	1	1	1	1	1	1
PE3001	Physical Education V			1	1	1	1
PE3002	Physical Education VI			1	1	1	1
PE3011	Physical-fitness Test I	0.5	0.5				
PE4011	Physical-fitness Test II	0.5	0.5				
PE4021	Physical Education VII--Fitness test and exercise			0.5	0.5	0.5	0.5

Course Code	Course Name	2016-2017	2018	2019	2020	2021	2022-
MITR1001	Military Training	2	2	2	2	2	2
MITR2001	Military Theory	1.5	1.5	2	2	2	2
	Total	28	32.5	31.5	34.5	34.5	33.5

International students are required to complete the following courses in Chinese language study and Chinese society to fulfill the graduation requirements along with the above 128 credit hours of courses towards the Bachelor of Engineering Degree at ZJU.

		2016-2022	2023-
Course Code	Course Name	Credits	Credits
CHIN 1001	Chinese I	4	4
CHIN 1002	Chinese II	5	4
CHIN 1003	Chinese III	4	4
CHIN 1004	Chinese IV	4	4
CHIN 1005	Language Proficiency and Testing		2
CULT 2001	China Survey	3	3
	Total	20	21

6. Sample Schedule by Semester

6.1 First Year-First (Fall) Semester

No	Course Code	Course Name	Credit Hours
1	Rhet 101	Principles of Writing	4
2	Chem 102	General Chemistry I	3
3	Chem 103	General Chemistry Lab I	1
4	Math 221	Calculus I	4
5	CEE 190	Project-Based Introduction to CEE	4
6	CS 101	Introduction to Computing: Engineering & Science	3
7	Eng 100	Engineering Orientation	1
		Total	20

No	Course Code	Course Name	Credit Hours
1	MITR 1001	Military Training	2
2	ENGL 1001	Integrated English I	1.5
3	PE 1001	Physical Education I	1
4	PS 1001	Chinese Social Development Situation and Policies I	
5	CHIN1001*	Chinese I	4.0

*International students required only

6.2 First Year-Second (Spring) Semester

No	Course Code	Course Name	Credit Hours
1	Rhet 102	Principles of Research	4
2	Math 231	Calculus II	3

3	Phys 211	University Physics: Mechanics	4
4	SE 101	Engineering Graphics & Design	3
5	Chem 104	General Chemistry II	3
6	Chem 105	General Chemistry II Lab	1
		Total	17

No	Course Code	Course Name	Credit Hours
1	LAW1001	Mental Education and Foundation of Law	2.5
2	LAW1002	Ideology, Morality and Rule of Law	
3	ENGL1002	Integrated English II	2
4	PE1002	Physical Education II	1
5	PS 1001	Chinese Social Development Situation and Policies I	1
6	CHIN1002*	Chinese II	5

*International students required only

6.3 Second Year-First (Fall) Semester

No	Course Code	Course Name	Credit Hours
1	Math 241	Calculus III	4
2	MATH 257	Linear Algebra with Computational Application	3
3	Phys 212	University Physics: Elec& Mag	4
4	TAM 211	Statics	3
5	CEE 201	System Engineering & Economics	3
		Total	17

No	Course Code	Course Name	Credit Hours
1	PS2011	Intro.to Mao Thought & Theoretical System of China Socialism	3
2	ENGL2001	Advanced Spoken English I	1.5
3	PE2001	Physical Education III	1
4	MITR2001	Military Theory	2
5	PS2001	Situation and Policy II	
6	CHIN1003*	Chinese III	4
7	CULT2001*	China Survey	3

*International students required only

6.4 Second Year-Second (Spring) Semester

No	Course Code	Course Name	Credit Hours
1	Math 285	Intro to Differential Eq	3
2	TAM 212	Introductory Dynamics	3
3	TAM 251	Introductory Solid Mechanics	3
4	CEE 202	Engineering Risk & Uncertainty	3
5	Phys 213	University Physics-Thermal Physics	2
6	GenEd 1	Liberal Education Elective	3
		Total	17

No	Course Code	Course Name	Credit Hours
1	HIST2001	Modern Chinese History	3
2	PHIL2002	Introduction to the Principle of Marxism	3
3	ENGL2002	Advanced Spoken English II	1.5
5	PS2001	Situation and Policy II	
5	PE2002	Physical Education IV	1
6	CHIN1004*	Chinese IV	4

*International students required only

6.5 Third Year-First (Fall) Semester

Juniors exchange to UIUC (dual degree only)

No	Course Code	Course Name	Credit Hours
1	TAM 335	Introductory Fluid Mechanics	4
2	CEE 300	Behavior of Materials	4
3	Core2	Civil Engineering Core Course 2	3
4	SciElec	Science Elective	3
5	GenEd	General Education Elective	3
		Total	17

No	Course Code	Course Name	Credit Hours
1	PE3001	Physical Education V	1

6.6 Third Year- Second (Spring) Semester

Juniors continue exchange to UIUC (dual degree only)

No	Course Code	Course Name	Credit Hours
1	Core3	Civil Engineering Core Course 3	3
2	Core4	Civil Engineering Core Course 3	3
3	Core5	Civil Engineering Core Course 3	3
4	FE	Free Elective	3
5	GenEd	Liberal Education Elective	3
		Total	15

No	Course Code	Course Name	Credit Hours
1	PE3002	Physical Education VI	1

6.7 Fourth Year-First (Fall) Semester

No	Course Code	Course Name	Credit Hours
1	CEE 495	Professional Practice	0
2	ATE1	Advanced Technical Elective 1 (Primary)	3
3	ATE2	Advanced Technical Elective 2 (Primary)	3
4	ATE3	Advanced Technical Elective 3 (Secondary)	3
5	Free Elec	Free Elective	3

6	GenEd	Liberal Education Elective	3
		Total	15

No	Course Code	Course Name	Credit Hours
1	PS3011	General Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3
2	PS2001	Situation and Policy II	1

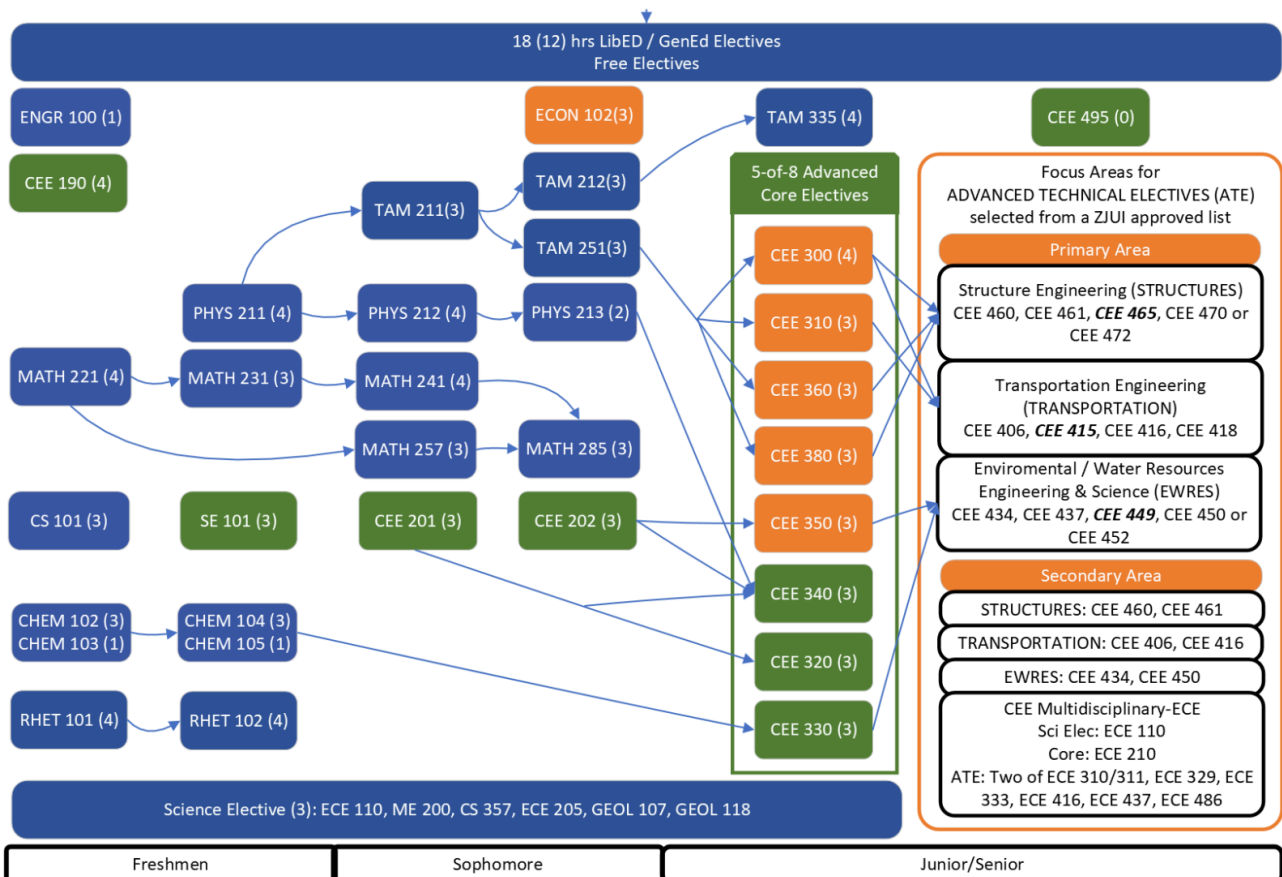
6.8 Fourth Year- Second (Spring) Semester

No	Course Code	Course Name	Credit Hours
1	ATE4	Advanced Technical Elective 4 (Primary)	3
2	ATE5	Advanced Technical Elective 5 (Primary)	3
3	ATE6	Advanced Technical Elective 6 (Secondary)	3
4	Free Elec	Free Elective	3
5	GenEd	Liberal Education Elective	3
		Total	15

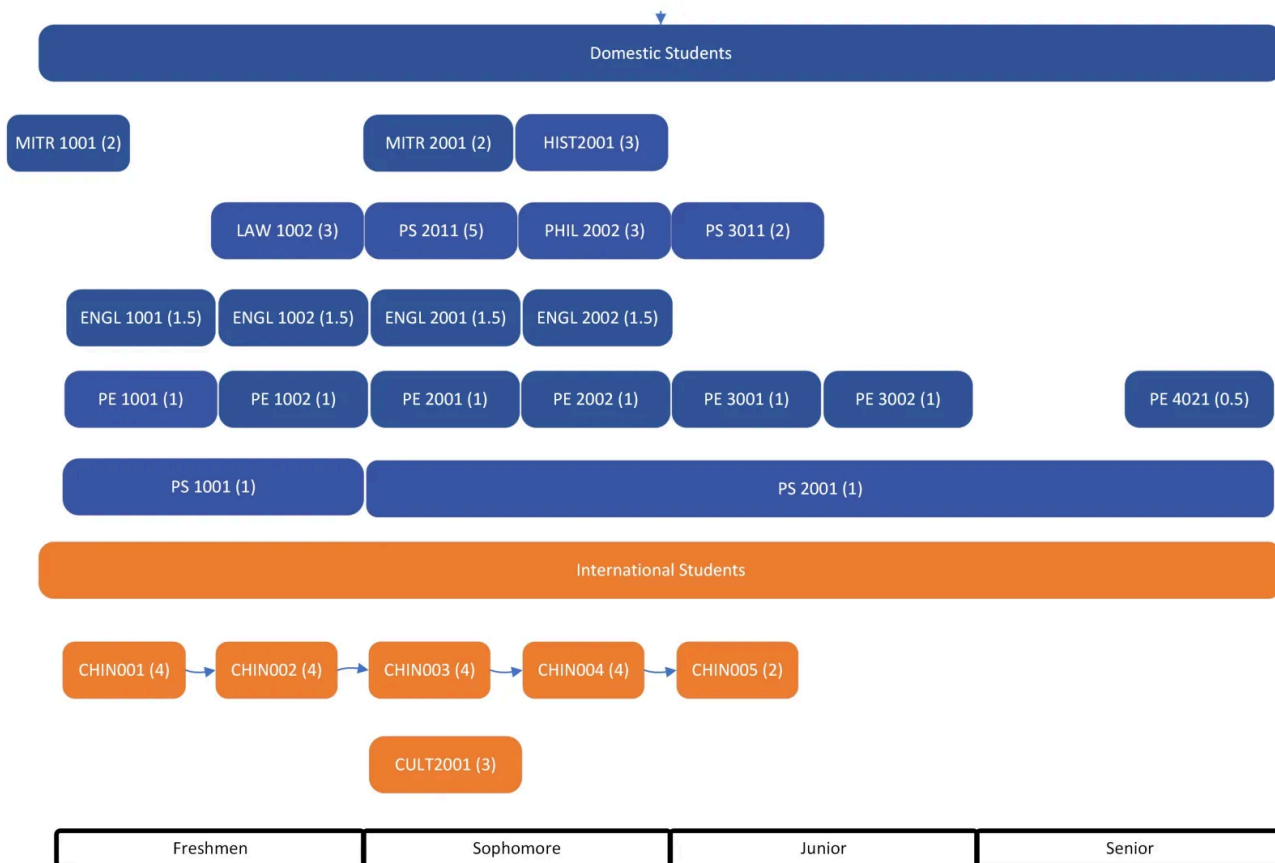
No	Course Code	Course Name	Credit Hours
1	PE4021	Physical Education VII--Fitness test and exercise	3
2	PS2001	Situation and Policy II	1

7. Curriculum Flow Map

The following flow map offers a quick summary of the main features of the Civil Engineering curriculum.



ZJU Required Liberal Education Course



Appendix A. Integrated Design Courses

An integrated design course is a course that has a design project as part of the course requirements. The following courses meet the conditions of an integrated design course.

CEE 401	Concrete Materials
CEE 415	Geometric Design of Roads
CEE 421	Construction Planning
CEE 449	Environmental Engineering Lab
CEE 453	Urban Hydrology and Hydraulics
CEE 465	Design of Structural Systems
CEE 484	Applied Soil Mechanics
CEE 493	Sustainable Design Eng Tech

Appendix B. Design Content of CEE Courses

The design content of a course is a number representing the number of credit hours of the course that are directly associated with engineering design. The design content of each CEE course in the catalog are listed below:

Course Code	Course Name	Credit
CEE 190	Project Based Introduction to CEE	0.00
CEE 199	Undergraduate Open Seminar	0.00
CEE 201	Systems Engineering & Economics	1.50
CEE 202	Engineering Risk & Uncertainty	1.50
CEE 300	Behavior of Materials	1.00
CEE 310	Transportation Engineering	1.00
CEE 311	Engineering Surveying	1.20
CEE 320	Construction Engineering	1.50
CEE 330	Environmental Engineering	0.50
CEE 331	Fluid Dynamics in the Natural and Built Environment	0.00
CEE 340	Energy and Global Environment	1.00
CEE 350	Water Resources Engineering	1.30
CEE 360	Structural Engineering	0.50
CEE 380	Geotechnical Engineering	1.00
CEE 401	Concrete Materials	1.00

CEE 405	Asphalt Materials, I	2.00
CEE 406	Pavement Design, I	2.50
CEE 407	Airport Design	2.00
CEE 408	Railroad Transportation Engineering	1.00
CEE 409	Railroad Track Engineering	2.00
CEE 410	Railway Signaling and Control	1.00
CEE 411	Railroad Project Design & Construction	2.00
CEE 412	High-Speed Rail Engineering	1.00
CEE 415	Geometric Design of Roads	3.00
CEE 416	Traffic Capacity Analysis	1.50
CEE 417	Urban Transportation Planning	0.00
CEE 418	Public Transportation Systems	1.00
CEE 419	Transportation Economics	0.00
CEE 420	Construction Productivity	2.10
CEE 421	Construction Planning	2.50
CEE 422	Construction Cost Analysis	1.80
CEE 424	Sustainable Const Methods	1.00
CEE 430	Ecological Quality Engineering	1.00
CEE 432	Stream Ecology	1.00
CEE 433	Water Technology and Policy	0.50
CEE 434	Environmental Systems, I	2.00
CEE 435	Public Health Engineering	0.00
CEE 437	Water Quality Engineering	1.50
CEE 438	Science and Environmental Policy	0.25
CEE 440	Fate Cleanup Environ Pollutant	1.00
CEE 441	Air Pollution Sources, Transport, and Control	2.00
CEE 442	Env Eng Principles, Physical	0.50
CEE 443	Env Eng Principles, Chemical	0.00
CEE 444	Env Eng Principles, Biological	0.00
CEE 447	Atmospheric Chemistry	0.00
CEE 449	Environmental Engineering Lab	2.00
CEE 450	Surface Hydrology	0.75
CEE 451	Environmental Fluid Mechanics	0.60
CEE 452	Hydraulic Analysis and Design	2.50
CEE 453	Urban Hydrology and Hydraulics	3.00
CEE 457	Groundwater	0.25
CEE 458	Water Resources Field Methods	1.00
CEE 459	Ecohydraulics	0.80
CEE 460	Steel Structures, I	2.40
CEE 461	Reinforced Concrete, I	2.40
CEE 462	Steel Structures, II	2.40
CEE 463	Reinforced Concrete, II	2.25
CEE 465	Design of Structural Systems	3.00
CEE 467	Masonry Structures	2.40
CEE 468	Prestressed Concrete	2.40
CEE 469	Wood Structures	2.40
CEE 470	Structural Analysis	1.00
CEE 471	Structural Mechanics	0.30
CEE 472	Structural Dynamics	1.00
CEE 473	Wind Effects on Structures	0.00
CEE 474	Mechanics of Additive Manufacturing	0.75
CEE 483	Soil Mechanics and Behavior	1.50
CEE 484	Applied Soil Mechanics	2.50
CEE 490	Computer Methods	0.00
CEE 491	Decision and Risk Analysis	1.50
CEE 492	Data Science for Civil and Environmental Engineering	0.00
CEE 493	Sustainable Design Eng Tech	2.00
CEE 495	Professional Practice	0.00
CEE 497*	Independent Study*	0.00
CEE 498*	Special Topics*	0.00

*Note: Design content in CEE 497 and CEE 498 is by default assigned to be zero.