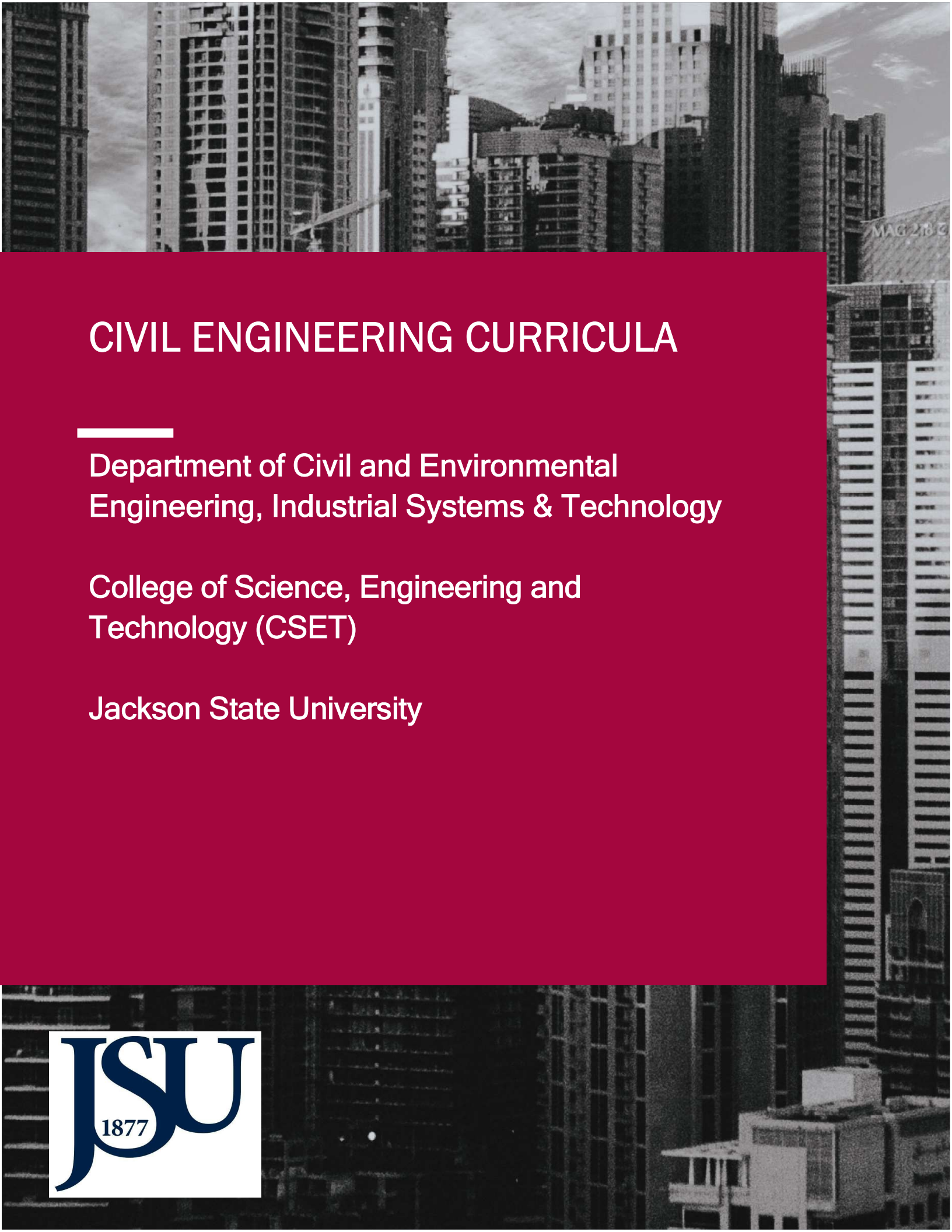

CIVIL ENGINEERING CURRICULA

Department of Civil and Environmental Engineering, Industrial Systems & Technology

College of Science, Engineering and Technology (CSET)

Jackson State University

COURSE TYPE DESCRIPTIONS		
General Education Core	GEC	**General Education Core (GEC)** courses are courses that every student must take in order to obtain a degree from Jackson State University. GEC courses are essential to every undergraduate degree at Jackson State University. Collectively, there are 30 credit hours of GEC course requirements.
General Education Pathway	PATH	**General Education Pathway (PATH)** courses are courses that are connected through interdisciplinary themes and are selected at the student's discretion to fulfill the general education curriculum. Through experiential learning and reflective writing, students will have the opportunity to integrate knowledge across courses, develop their skills and an enhanced sense of civic responsibility. Students select nine (9) hours from the pathway of choice. Each pathway concludes with a related one (1) credit hour a University Required (UR) course.
University Required	UR	**University Required (UR)** courses are courses that are specific to Jackson State University and are designed to integrate students within the Jackson State University community by promoting student success resources, strategies and high impact practices.
Degree Program Requirement	DPR	**Degree Program Required (DPR)** courses are courses that are required for completion of a degree program within the specified major.
Electives	DPE or GEL	**Electives** are courses selected at a student's discretion and provide opportunities for students to pursue their academic interests. There are two types of electives. **Degree Program Elective (DPE)** courses are elective courses that are partially restricted such that students select courses from a specified group of identified courses (e.g., departmental elective courses) to fulfill a particular requirement. **General Elective (GEL)** courses are courses that may be selected from any program for which the student has fulfilled the proper prerequisites.
Professional Concentrations	PC	**Professional Concentration (PC)** courses complement Degree Program Required courses and allow students to have a concentrated area of study within the major.

Degree Map: Catalog 2023-2024

Student Name: _____

J-Number: _____

Advisor: _____

COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY

B.S. in CIVIL ENGINEERING

CONC.: GENERAL CIVIL ENGINEERING

Entering Term: _____

Expected Graduation Date: _____

Pathway: _____

FRESHMAN YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
UNIV 100	University Success	2	UR		
MATH 241	Calculus I with Laboratory	3	GEC		ACT Math Score 21 or MATH 112 or Precalculus
CHEM 141 & CHML 141	General Chemistry I & Lab	4	GEC		MATH 111
ENG 104	Composition I	3	GEC		ACT English Score 17 or SAT 470
	Humanities & Fine Arts Option	3	GEC		
	TOTAL CREDIT HOURS	15	TERM GPA:		
Comments:					

FRESHMAN YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
MATH 242	Calculus II with Laboratory	3	DPR		MATH 241
PHY 211 & PHYL 211	General Physics I & Lab	4	GEC		MATH 241
ENG 105	Composition II	3	GEC		ENG 104
	Social & Behavioral Science Option	3	GEC		
	Pathway Option	3	PATH		
	TOTAL CREDIT HOURS	16	TERM GPA:		
Comments:					

SOPHOMORE YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
MATH 243	Calculus III with Laboratory	3	DPR		MATH 242
PHY 212 & PHYL 212	General Physics II and Lab	4	DPR		PHY 211
CIV 222	Engineering Mechanics I	3	DPR		PHY 211 (co-req)
CIV 201	Engineering Graphics	2	DPR		MATH 112 or MATH 118
BIO 101 & BIOL 101 or SCI 205	Introduction to Biology & Lab or Earth Space Science	3	DPR		
	Pathway Option	3	PATH		
	TOTAL CREDIT HOURS	18	TERM GPA:		
Comments:					

SOPHOMORE YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
MATH 244	Calculus IV with Laboratory	3	DPR		MATH 243
MATH 368	Ordinary Differential Equations I	3	DPR		MATH 243
CIV 223	Engineering Mechanics II	3	DPR		CIV 222, MATH 242
CIV 240	Strength of Materials	3	DPR		CIV 222
UNIV 200	Civic Engagement	1	UR		
	Pathway Option	3	PATH		
	TOTAL CREDIT HOURS	16	TERM GPA:		
Comments:					

JUNIOR YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
MATH 307	Probability & Statistics for Engineering	3	DPR		MATH 242
CIV 320	Structural Analysis	3	DPR		CIV 240
CIV 330	Fluid Mechanics	3	DPR		CIV 223, MATH 368 (co-req)
CIV 340 & CIVL 340	Introduction to Environmental Engineering and Lab	4	DPR		CHEM 141, CIV 330 (co-req)
CIV 355	Engineering Economy	3	DPR		MATH 242
	TOTAL CREDIT HOURS	16	TERM GPA:		
Comments:					

JUNIOR YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 360	Design of Steel Structure	3	DPR		CIV 320
CIV 370	Water Resources Engineering	3	DPR		CIV 330
CIV & CIVL 380	Introduction to Geotechnical Engineering and Lab	4	DPR		CIV 340
CIV 390	Introduction to Transportation Engineering	3	DPR		CIV 380
CIVL 330	Fluid Mechanics Lab	1	DPR		CIV 330
	Civil Engineering Elective	3	DPE		
	TOTAL CREDIT HOURS	17	TERM GPA:		
Comments:					

SENIOR YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 410	Capstone Design I	3	DPR		CIV 340, CIV 360, CIV 390, senior standing
CIV 420	Design of Concrete Structure	3	DPR		CIV 320
CIVL 421	Structural Engineering Lab	1	DPR		CIV 420 (co-req)
CIV 430	Foundation Engineering	3	DPR		CIV 380
CIV 461	Professional & Ethical Issues in Civil Engineering	1	DPR		Senior standing
	Civil Engineering Elective	3	DPE		
	Civil Engineering Elective	3	DPE		
	TOTAL CREDIT HOURS	17	TERM GPA:		
Comments: CIV 461 is offered in the first senior semester.					

SENIOR YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 411	Capstone Design I	3	DPR		CIV 410
	Civil Engineering Elective	3	DPE		
	Civil Engineering Elective	3	DPE		
	Humanities & Fine Arts Option	3	GEC		
	TOTAL CREDIT HOURS	12	TERM GPA:		
Comments:					

TOTAL HOURS: 127 REQUIRED

Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100: University Success; however, the student must take 2 hours of general electives to replace UNIV 100.

Student Signature: _____ Advisor Signature: _____

CIVIL ENGINEERING DEGREE PROGRAM ELECTIVES
CIV 310 & CIVL 310 Eng. Surveying Lecture and Lab.
CIV 431Traffic Engineering
CIV 432 Bridge Design
CIV 441 Water & Wastewater Treatment
CIV 451 Computer Methods in Civil Engineering
CIV 452 Construction Project Management
CIV 453 Construction Estimating
CIV 454 Construction Scheduling
CIV 455 Building Information Modeling and Integrated Project Delivery
CIV 460 Design of Environmental Engineering Facilities
CIV 465 Advanced Water Resources Engineering
CIV 466 Advanced Design of Hydraulic Structures
CIV 468 Hazardous Waste Engineering
CIV 470 Urban Transportation Engineering System Design
CIV 471 Principles of Geoenvironmental Engineering
CIV 472 Applied Geotechnical Engineering Design
CIV 475 Pavement Design
CIV 476 Advanced Design of Steel Structures
CIV 477 Advanced Design of Concrete Structures
CIV 478 Design of Wood and Masonry Structures
CIV 479 Evaluation, Maintenance, and Rehabilitation of Public Works Infrastructure
CIV 481 Special Problems in Civil Engineering
CIV 491 Internship in Civil Engineering I
CIV 492 Internship in Civil Engineering II

At least one civil engineering elective must be chosen from CIV 441 or CIV 460 (required environmental engineering elective). At least one civil engineering elective must be chosen from CIV 431, CIV 470, CIV 475 or CIV 479 (required transportation engineering elective). The selection of other courses requires the approval of adviser and Departmental Chair.

SOCIAL & BEHAVIORAL SCIENCE OPTIONS

COUN 315	Human Growth & Development
ECO 211	Principles of Microeconomics
GEOG 105	Introduction to Cultural Geography
SOC 214	Introduction to Sociology
SOC 325	Cultural Anthropology
SS 201	Social Institutions
SW 225	Human Diversity & Social Justices
PS 134	Introduction to Political Science
PS 135	American Government
PS 136	State & Local Government
PSY 201	Introduction to Psychology

At least one course must be chosen from the above list.

NATURAL SCIENCES
BIO 101 & BIOL 101 Introduction to Biology & Lab
BlO 111 & BIOL 111 Biological Science & Lab
SCI 205 Earth Space Sciences

At least one natural science course must be chosen from the above list.

HUMANITIES AND FINE ARTS

ART 206	Art Appreciation
MUS 205	Music Appreciation

MUS 218	Jazz Appreciation
DR 201	Introduction to Drama
ENG 201	Humanities I
ENG 202	Humanities I
ENG 205	World Literature
FR 101	Elementary French I
FR 102	Elementary French II
HIST 101	History of Civilization I
HIST 102	History of Civilization II
HIST 201	US History I
HIST 202	US History II
PHIL 301	Introduction to Philosophy
PHIL 309	Ethics
PHIL 414	Logic
SP 101	Elementary Spanish I
SP 102	Elementary Spanish II
SPCH 201	Speech Arts
SW 210	Professional Behaviors, Ethics & Communications

At least three courses must be chosen from the above.

GENERAL EDUCATION PAYWAY OPTIONS

- Data and Information Literacy Pathway
- Discourse Pathway
- Environment, conservation, and sustainability Pathway
- Financial Literacy Pathway
- Global Pathway
- Justice Pathway
- Physical, Mental, and Public Health Pathway
- Leadership Pathway (effective Fall 2023)

Each student must select one of the general education pathways listed above and take three courses (9 credit hours) designated for a specific pathway option (see later pages for lists of courses for each pathway option).

DEVELOPMENTAL COURSE REQUIREMENTS

ENG 002	Required for students with an ACT English subtest score of 16 or less. Strongly encouraged for students with English subtest score of 19 or less.
MATH 004	Required for students with an ACT Mathematics subtest score of 16 or less. Strongly encouraged for students with Mathematics subtest score of 19 or less.
RE 002	Required for students with an ACT Reading subtest score of 16 or less. Strongly encouraged for students with Reading subtest score of 19 or less.
GNST 101,102	Required for students taking two or more intermediate courses. Students in the Academic Support Program will not be permitted to take more than 15 semester hours, including intermediate courses and the Academic Support Program.

Degree Map: Catalog 2022-2023

Student Name: _____

J-Number: _____

Advisor: _____

JSU JACKSON STATE UNIVERSITY 1877

COLLEGE OF

SCIENCE, ENGINEERING AND TECHNOLOGY

B.S. in CIVIL ENGINEERING

CONC.: ENVIRONMENTAL ENGINEERING

Entering Term: _____

Expected Graduation Date: _____

Pathway: _____

FRESHMAN YEAR FALL 1ST SEMESTER

COURSE	COURSE TITLE	CREDIT HOURS	COURSE TYPE	GRADE	PREREQUISITE
UNIV 100	University Success	2	UR		
MATH 241	Calculus I & Lab	3	GEC		ACT Math Score 21 or MATH 112 or Precalculus
CHEM 141 & CHML 141	General Chemistry I & Lab	4	GEC		MATH 111
ENG 104	Composition I	3	GEC		ACT English Score 17 or SAT 470
	Humanities & Fine Arts Option	3	GEC		
	TOTAL CREDIT HOURS	15	TERM GPA:		

Comments:

FRESHMAN YEAR SPRING 2ND SEMESTER

COURSE	COURSE TITLE	CREDIT HOURS	COURSE TYPE	GRADE	PREREQUISITE
MATH 242	Calculus II & Lab	3	DPR		MATH 241
PHY 211 & PHYL 211	General Physics I & Lab	4	GEC		MATH 241
ENG 105	Composition II	3	GEC		ENG 104
	Pathway Option	3	PATH		
	Pathway Option	3	PATH		
	TOTAL CREDIT HOURS	16	TERM GPA:		

Comments:

SOPHOMORE YEAR FALL 1ST SEMESTER

COURSE	COURSE TITLE	CREDIT HOURS	COURSE TYPE	GRADE	PREREQUISITE
MATH 243	Calculus III & Lab	3	DPR		MATH 242
CHEM 142 & CHML 142	General Chemistry II & Lab	4	DPR		CHEM 141
CIV 222	Engineering Mechanics I	3	DPR		PHY 211 (co-req)
CIV 201	Engineering Graphics	2	DPR		MATH 112 or MATH 118
BIO 101 & BIOL 101 or SCI 205	Introduction to Biology & Lab or Earth Space Science	3	DPR		
	Pathway Option	3	PATH		
	TOTAL CREDIT HOURS	18	TERM GPA:		

Comments:

SOPHOMORE YEAR SPRING 2ND SEMESTER

COURSE	COURSE TITLE	CREDIT HOURS	COURSE TYPE	GRADE	PREREQUISITE
MATH 244	Calculus IV & Lab	3	DPR		MATH 243
MATH 368	Ordinary Differential Equations I	3	DPR		MATH 243
CIV 223	Engineering Mechanics II	3	DPR		CIV 222, MATH 242
CIV 240	Strength of Materials	3	DPR		CIV 222
CHEM 241	Organic Chemistry I	3	DPR		CHEM 142
UNIV 200	Civic Engagement	1	UR		
	TOTAL CREDIT HOURS	16	TERM GPA:		

Comments:

JUNIOR YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
MATH 307	Probability & Statistics for Engineering	3	DPR		MATH 242
CIV 320	Structural Analysis	3	DPR		CIV 240
CIV 330	Fluid Mechanics	3	DPR		CIV 223, MATH 368 (co-req)
CIV 340 & CIVL 340	Introduction to Environmental Engineering and Lab	4	DPR		CHEM 141, CIV 330 (co-req)
CIV 355	Engineering Economy	3	DPR		MATH 242
	TOTAL CREDIT HOURS	16	TERM GPA:		
Comments:					

JUNIOR YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 360	Design of Steel Structure	3	DPR		CIV 320
CIV 370	Water Resources Engineering	3	DPR		CIV 330
CIV & CIVL 380	Introduction to Geotechnical Engineering and Lab	4	DPR		CIV 340
CIV 390	Introduction to Transportation Engineering	3	DPR		CIV 380
CIVL 330	Fluid Mechanics Lab	1	DPR		CIV 330
	Social & Behavioral Science Option	3	GEC		
	TOTAL CREDIT HOURS	17	TERM GPA:		
Comments:					

SENIOR YEAR FALL 1ST SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 410	Capstone Design I	3	DPR		CIV 340, CIV 360, CIV 390, senior standing
CIV 420	Design of Concrete Structures	3	DPR		CIV 320
CIVL 421	Structural Engineering Lab	1	DPR		CIV 420 (co-req)
CIV 430	Foundation Engineering	3	DPR		CIV 380
CIV 461	Professional & Ethical Issues in Civil Eng.	1	DPR		Senior standing
	Civil Engineering Elective	3	DPE		
	Civil Engineering Elective	3	DPE		
	TOTAL CREDIT HOURS	17	TERM GPA:		
Comments: CIV 461 is offered in the first senior semester.					

SENIOR YEAR SPRING 2ND SEMESTER					
COURSE	**COURSE TITLE**	**CREDIT HOURS**	**COURSE TYPE**	**GRADE**	**PREREQUISITE**
CIV 411	Capstone Design I	3	DPR		CIV 410
	Civil Engineering Elective	3	DPE		
	Civil Engineering Elective	3	DPE		
	Humanities & Fine Arts Option	3	GEC		
	TOTAL CREDIT HOURS	12	TERM GPA:		
Comments:					

TOTAL HOURS: 127 REQUIRED

Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100: University Success; however, the student must take 2 hours of general electives to replace UNIV 100.

Student Signature: _____ Advisor Signature: _____

CIVIL ENGINEERING DEGREE PROGRAM ELECTIVES

CIV 310 & CIVL 310 Eng. Surveying Lecture and Lab.
CIV 431Traffic Engineering
CIV 432 Bridge Design
CIV 441 Water & Wastewater Treatment Processes
CIV 451 Computer Methods in Civil Engineering
CIV 452 Construction Project Management
CIV 453 Construction Estimating
CIV 454 Construction Scheduling
CIV 455 Building Information Modeling and Integrated Project Delivery
CIV 460 Design of Environmental Engineering Facilities
CIV 465 Advanced Water Resources Engineering
CIV 466 Advanced Design of Hydraulic Structures
CIV 468 Hazardous Waste Engineering
CIV 470 Urban Transportation Engineering System Design
CIV 471 Principles of Geoenvironmental Engineering
CIV 472 Applied Geotechnical Engineering Design
CIV 475 Pavement Design
CIV 476 Advanced Design of Steel Structures
CIV 477 Advanced Design of Concrete Structures
CIV 478 Design of Wood and Masonry Structures
CIV 479 Evaluation, Maintenance, and Rehabilitation of Public Works Infrastructure
CIV 481 Special Problems in Civil Engineering
CIV 491 Internship in Civil Engineering I
CIV 492 Internship in Civil Engineering II

At least two civil engineering electives must be chosen from CIV 441, CIV 460, CIV 468, or CIV 471. The selection of other courses requires the approval of adviser and Dept. Chair.

At least one civil engineering elective must be chosen from CIV 431, CIV 470, CIV 475 or CIV 479. The selection of other courses requires the approval of adviser and Dept. Chair.

The students are required to contact their advisers or department chair prior to taking any civil engineering elective.

SOCIAL & BEHAVIORAL SCIENCE OPTIONS

COUN 315	Human Growth & Development
ECO 211	Principles of Microeconomics
GEOG 105	Introduction to Cultural Geography
SOC 214	Introduction to Sociology
SOC 325	Cultural Anthropology
SS 201	Social Institutions
SW 225	Human Diversity & Social Justices
PS 134	Introduction to Political Science
PS 135	American Government
PS 136	State & Local Government
PSY 201	Introduction to Psychology

At least one course must be chosen from the above list.

NATURAL SCIENCES

BIO 101 & BIOL 101 Introduction to Biology & Lab
BlO 111 & BIOL 111 Biological Science & Lab
SCI 205 Earth Space Sciences

At least one natural science course must be chosen from the above list.

HUMANITIES AND FINE ARTS

ART 206	Art Appreciation
MUS 205	Music Appreciation
MUS 218	Jazz Appreciation
DR 201	Introduction to Drama
ENG 201	Humanities I
ENG 202	Humanities I
ENG 205	World Literature
FR 101	Elementary French I
FR 102	Elementary French II
HIST 101	History of Civilization I
HIST 102	History of Civilization II
HIST 201	US History I
HIST 202	US History II
PHIL 301	Introduction to Philosophy
PHIL 309	Ethics
PHIL 414	Logic
SP 101	Elementary Spanish I
SP 102	Elementary Spanish II
SPCH 201	Speech Arts
SW 210	Professional Behaviors, Ethics & Communications

At least three courses must be chosen from the above.

GENERAL EDUCATION PAYWAY OPTIONS

- Environment, conservation, and sustainability Pathway
- Physical, Mental, and Public Health Pathway
- Data and Information Literacy Pathway
- Justice Pathway
- Discourse Pathway
- Global Pathway
- Financial Literacy Pathway

Each student must select one of the general education pathways listed above and take three courses (9 credit hours) designated for a specific pathway option (see later pages for lists of courses for each pathway option).

DEVELOPMENTAL COURSE REQUIREMENTS

ENG 002	Required for students with an ACT English subtest score of 16 or less. Strongly encouraged for students with English subtest score of 19 or less.
MATH 004	Required for students with an ACT Mathematics subtest score of 16 or less. Strongly encouraged for students with Mathematics subtest score of 19 or less.
RE 002	Required for students with an ACT Reading subtest score of 16 or less. Strongly encouraged for students with Reading subtest score of 19 or less.
GNST 101,102	Required for students taking two or more intermediate courses. Students in the Academic Support Program will not be permitted to take more than 15 semester hours, including intermediate courses and the Academic Support Program.

DATA & INFORMATION LITERACY PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
CSC 115	Computer Digital Principles	3
CSC 215	Data Analytics	3
ENG 325	Black Image in the Media	3
ITD 114	Computer Aided Drafting	3
JMS 250	Media Literacy	3
MET 270	Computational Data Analysis Visualization	3
MNGT 350	Business Computer Applications	3
PS 236	Political Statistics	3

DISCOURSE PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
CLL 104	Workforce Communication, Behavior & Culture	3
CLHR 220	Training, Developing, and Communicating	3
CMD 211	Introduction to Communication Disorders	3
ENG 213	Professional Writing	3
ENG 300	Introduction to Creative Writing	3
ENG 331	Introduction to Linguistics	3
JMS 200	Introduction to Mass Communications	3

JMS 201	Introduction to Media Writing *(Prerequisites: ENG 104, 105 or 111 and 112. JMS 200 recommended)*	3
SPCH 201	Speech Arts	3
SPCH 214	Interpersonal Communications	3
SPCH 215	Training the Speaking Voice	3
SPCH 216	Public Speaking	3
SPCH 218	Listening	3
American Sign Language Recommended Sequence of Courses		
SPED 466	Introduction to Sign Language	3
SPED 467	Advanced Sign Language	3

ENVIRONMENT, CONSERVATION & SUSTAINABILITY PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
BIO 103	Environmental Science	3
BIO 114	Introduction to Marine & Environmental Science	2
CHEM 131	Introduction to Chemistry	3
GEOG 105	Introduction to Cultural Geography	3
ITEM 301	Principles of Emergency Management	3
SOC 216	Modern Social Problems	3

FINANCIAL LITERACY PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
ACC 202	Foundations of Accounting	3
ECO 202	Foundation of Economic Issues	3
ECO 204	Black Economic & Social Issues	3
ECO 206	Foundations of Global Economics	3
ENTR 285	Creativity, Innovation & Entrepreneurship	3
GB 201	Introduction to Legal Aspects of Business	3
FIN 220	Foundations of Finance	3
FIN 247	Foundations of Stock Market Investing	3

GLOBAL PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS

ART 206	Art Appreciation	3
ART 337	Non-Western Art	3
French Recommended Sequence of Courses		
FR 101	Elementary French	3
FR 102	Elementary French II	3
FR 201	Intermediate French	3
History Recommended Sequence of Courses		
HIS 101	History of Civilization I	3
HIS 102	History of Civilization II	3
HIS 201	US History I	3
HIS 202	US History II	3
MUS 202	World Music Cultures	3
MUS 205	Music Appreciation	3
MUS 218	Jazz Appreciation	3
MUS 350	Roots of Music from Africa	3
SS 111	Ethnic Studies Survey- Black Americans	3
SS 211	Ethnic Studies Survey- Native & Hispanic Americans	3
SS 212	Ethnic Studies Survey- Jewish & Asian Americans	3
SOC 325	Cultural Anthropology	3
Spanish Recommended Sequence of Courses		
SP 101	Elementary Spanish	3
SP 102	Elementary Spanish II	3
SP 201	Intermediate Spanish	3
Study Abroad Courses	*Consult with JSU Global for applicable Study Abroad Pathway options.*	

JUSTICE PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
CJ 100	Introduction to Criminal Justice	3
CJ 210	Introduction to Correctional Services	3
CJ 215	Ethics in Criminal Justice	3
SOC 216	Modern Social Problems	3
SW 215	Social Welfare Policies & Programs	3
SOC 329	Social Change	3
SW 360	Social Issues in Film	3
ECO 204	Black Economic & Social Issues	3

PHYSICAL, MENTAL & PUBLIC HEALTH PATHWAY OPTIONS (PATH)		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
BIO 236	Concepts of Public Health	3
HE 101	Concepts of Health	3
HE 113	First Aid	3
HE 122	Foundations of Health	3
HE 208	Epidemiology of Diseases	3
SOC 302	Basic Issues in Mental Health	3
SOC 310	Introduction to Alcohol & Drug Abuse	3
SW 230	Basic Trauma and Trauma-Informed Care	3
TREC 104	Introduction to Therapeutic Recreation	3
PE	Any three (3) one-hour activity courses with a Physical Education prefix.	(1) x 3

LEADERSHIP PATHWAY OPTIONS (PATH) *Effective Fall 2023*		
COURSE NUMBER	COURSE TITLE	CREDIT HOURS
AS 101	Heritage and Values	1
AS 102	Heritage and Values II	1
AS 201	Teambuilding and Leadership Fundamentals I	1
AS 202	Teambuilding and Leadership Fundamentals II	1
MATH 103*	College Algebra with Co-Requisite Support	3
MATH 114*	Quantitative Reasoning	3
ENG 228	English Word Power	3
ENG 330	Syntax	3
Option 1: Air Force *(Air Force ROTC Recommended Sequence of Course Options. MATH 103, MATH 114, ENG 228 & ENG 330 support the preparation for the AFOQT exam required for students pursuing officer commissioning.*		
MS 101	Foundations of Officership	1
MS 103	Offership Leadership Lab	1
MS 102	Basic Leadership	1
MS 104	Leadership Lab	1
MS 201	Individual Leadership Studies	2
MS 203	Leadership Lab	1
MS 202	Leadership and Teamwork	2
MS 204	Leadership Lab	1

Option 2: Army *(Army ROTC Recommended Sequence of Course Options.) MS courses are open for all majors to enroll.)*		
HON 110	Honors Colloquium	1
Prerequisite*: Enrollment in HON 110 is required for Du Bois- Harvey Honors College students.*		
CLHR 220	Training, Developing, and Communicating	3
SW 210	Professional Behaviors, Ethics & Communication	3
ENG 213	Professional Writing	3
SPCH 214	Interpersonal Communications	3
SPCH 216	Public Speaking	3
UNIV 300	Experiential Learning I	Variable Credit
UNIV 301	Experiential Learning II	Variable Credit
Prerequisite: *Enrollment in UNIV 300 or UNIV 301 requires prior approval, including verification of an experiential learning activity. Contact theepathway@jsums.edu for approval.*		

COURSE DESCRIPTIONS

CIV 201 (2) Engineering Graphics. Prerequisite: MATH 112 or MATH 118 or Equivalent.
Develop skills to visualize and represent three-dimensional objects graphically, orthographic projection, pictorial drawings, graphics and charts, principles of computer-aided drafting and design (CADD) including substantial use of the AutoCAD software or equivalent, two and three-dimensional drafting and pictorial drawings using a CADD system, applications in various engineering disciplines and systems approach.

CIV 222 (3) Engineering Mechanics I. Co-requisite: PHY 211. Calculus-based statics of particles and rigid bodies; equilibrium; distributed forces; centroids; structures, trusses, frames, machines; forces in beams and cables; friction; moments of inertia, real life examples for engineering applications and systems approach**.**

CIV 223 (3) Engineering Mechanics II. Prerequisite: CIV 222, MATH 242. Calculus-based kinematics and kinetics of a particle. Planar kinematics of a rigid body: planar kinetics of a rigid body including force and acceleration; work and energy; impulse and momentum; vibrations, real life examples and systems approach.

CIV 240 (3) Strength of Materials. Prerequisite: CIV 222. Forces and stresses, axial loading, torsion, pure bending, transverse loading, shear force and bending moment diagrams, transformation of stress and strain, design of beams and shafts, deflection of beams, statically indeterminate problems, energy methods, columns, real life examples and systems approach.

CIV 310 (2) Engineering Surveying. Prerequisite: PHY 211, Co-requisite: CIV 311.
Plane surveying, measurement of distances and angles, differential leveling, traverse adjustment and area computations, topographic surveying and contours, horizontal and vertical curves, surveying computations, elements of site plan, Professional ethics in surveying.

CIVL 310 (1) Engineering Surveying Laboratory. Prerequisite: PHY 211, Co-requisite: CIV 310. Field experience to measure surveying parameters including distances, angles, and elevations. Field notes, surveying equipment; critically analyze and interpret data, report writing.

CIV 320 (3) Structural Analysis. Prerequisite: CIV 240. Analysis of statically determinate and indeterminate structures for fixed and moving loads. Equations of equilibrium and compatibility. Influence lines, and shear and moment envelopes. Analysis of forces and deflections in structures by methods of moment distribution, consistent deformation, and virtual work, computer analysis of structures, real life examples.

CIV 330 (3) Fluid Mechanics. Prerequisites: CIV 223, CIV 240, Co-requisite: MATH 368. The objective of this course is to provide students with a fundamental knowledge in the dynamics of fluid flows. In this course basic conservation laws of mass, momentum, energy principles, dimensional analyses, boundary layer, fluid drag and lift will be taught with an emphasis in developing problem solving skills for real world engineering applications.

CIVL 330 (1) Fluid Mechanics Laboratory. Prerequisite: CIV 330. Laboratory experience to measure fluid properties and apply principles for application in engineering design. The experiments will include pressure and velocity measurement, application of mass, energy, and momentum principles, energy losses, forces on immersed bodies, and flow measurement devices; critically analyze and interpret data, report writing.

CIV 340 (3) Introduction to Environmental Engineering. Prerequisites: CHEM 141; co-requisites; CIVL 340, CIV 330. Basic concepts of environmental engineering, local and global environmental issues, scientific, social, ethical, regulations and public policy on environmental protection; quantitative engineering analysis of sources, transformations, and effects of pollutants in water, air, and soil; introduction to water and wastewater treatment processes, air pollution control technologies, solid waste and hazardous waste management. This course requires the completion of a service-learning component in specific areas of environmental engineering.

CIVL 340 (1) Environmental Engineering Laboratory. Prerequisite: CHEM 141 , Co-requisites: CIV 340, CIV 330. Experiments for the analysis of water, wastewater and certain solid wastes. Selected experiments may include determinations of water's or wastewater's pH, alkalinity, turbidity, hardness, and electric conductivity; solids, nitrogen species, dissolved oxygen, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon, and chlorinated compounds. Also included will be contaminant leaching test of some solid or hazardous wastes and absorption of contaminants by solid media. Critical analysis of experimental and interpretation of data and scientific presentation (reporting) of results are emphasized.

CIV 355 (3) Engineering Economy. Prerequisite: MATH 242 and junior standing. Introduction to economic principles, application of economic principles to multidisciplinary engineering problems; calculation of capitalized costs, present worth, prospective rates of return, and annual costs, economy of equipment replacement, market forces and firm analysis; case studies and group project.

CIV 360 (3) Design of Steel Structures. Prerequisite: CIV 320. The course topics includes engineering properties and behaviors of structural steel subjected to various environmental variations, including fatigue, cold work, and temperature impacts, and dynamic impacts; basic design philosophy of Load and Resistance Factored Design (LRFD) and its theoretical background; design methods and code provisions on steel tension members, connections of bolts and weld, steel compression members, and steel columns in steel frame system; and basic practice of design of various steel structures.

CIV 370 (3) Water Resources Engineering. Prerequisites: CIV 330 and CIVL 330.This course is designed to review the fundamentals and practices of water resources engineering. Students will explore water resources engineering processes in the theoretical and applied realm in the fields of closed conduit (pipe) flow, open channel flow, surface water hydrology, and groundwater flow. Application of probability and statistical concepts along with the legal, economic and environmental considerations to the analysis and design of complex hydraulic and hydrologic systems will prepare interested students for future careers in water supply, wastewater, floodplain, storm water, and groundwater management.

CIV 380 (3) Introduction to Geotechnical Enineering. Prerequisites: CIV 240, and CIV 330. Co-requisite: CIVL 380. Engineering soil classification, flow of water in soils, soil permeability and seepage, concepts of effective stress, stress and compressibility of soils, primary and secondary consolidation settlement, time rate of settlement, soil compaction, soil shear strength, introduction to slope stability, critical thinking and engineering judgment.

CIVL 380 (1) Geotech. Engrg. Laboratory. Co-requisite: CIV 380. Laboratory experiments to be performed by students to obtain soil parameters required for designed problems. Engineering classification of soils, grain size distribution, Atterberg limits, specific gravity, unconfined compression, compaction, in-situ field tests, consolidation, and shear strength determination, applications to design problems, critically analyze and interpret data, report writing.

CIV 390 (3) Introduction to Transportation Engineering. Co-requisite: CIV 380. Introduction to planning practice and procedure, design, operation, management, and maintenance of transportation systems, with emphasis on urban issues. General characteristics of transportation engineering systems including streets, highways, transit, airways. Capacity considerations including time-space diagrams. Elementary dynamics of traffic and functional consideration of routes and terminals. Components of transportation engineering facility design including geometric design, earthwork, and pavements.

CIV 410 (3) Capstone Design I. Prerequisite: CIV 340, CIV 360, CIV 390 and senior Standing in Civil Engineering. Group projects for senior students to work in teams to analyze and design civil engineering systems, and to consider various factors for design. Understanding of multi-disciplinary systems, interaction between design and construction professionals, realistic design constraints, economical issues, professional practice issues including importance of professional licensure and continuing education, contemporary issues, procurement of work, bidding vs. quality based selection processes, engineering professionalism and ethics. Developing teamwork and leadership skills. Oral presentation and written report is required.

CIV 411 (3) Capstone Design II. Prerequisite: CIV 411. Continuation of Capstone Design I. Group projects for senior students to work in teams to analyze and design civil engineering systems, and to consider various factors for design. Understanding of multi-disciplinary systems, interaction between design and construction professionals, realistic design constraints, economical issues, professional practice issues including importance of professional licensure and continuing education, contemporary issues, procurement of work, bidding vs. quality based selection processes, engineering professionalism and ethics. Developing teamwork and leadership skills. Oral presentation and written report is required.

CIV 420 (3) Design of Concrete Structures. Prerequisites: CIV 320. The course topics include behaviors of reinforced concrete structural elements under different conditions; design criterions of Load and Resistance Factored Design (LRFD) for strength and serviceability of concrete structures; design method and code provisions on reinforced concrete members subjected to bending, shear, combination of shear and torsion, and combination of axial compression and bending moment; development length of reinforcement in concrete, design method and code provisions on columns in concrete frame systems; basic practice of design and construction of various concrete structures; and introduction to project management.

CIVL 421 (1) Structural Engineering and Materials Testing Lab. Prerequisite CIV 240. Engineering properties and behavior of concrete and other structural members. Test of a small-scale model structures. Use of computer-based data acquisition and interpretation systems for comparison of experimental and theoretically predicted behavior; nondestructive testing, critically analyze and interpret data, report writing.

CIV 430 (3) Foundation Engineerin. Prerequisite: CIV 380. Shallow foundation analysis and factors to consider for design, subsurface investigations for design, bearing capacity and settlement, mat foundations, piles, caissons, lateral earth pressures and retaining walls, site improvement techniques, design of sheet pile walls and support systems, critical thinking and engineering judgment, ethical considerations.

CIV 431 (3) Traffic Engineering. Prerequisite: CIV 390. Study of fundamentals of traffic engineering; analysis of traffic stream characteristics, capacity of urban and rural highways; design and analysis of traffic signals and intersection; traffic control; traffic impact studies; and traffic accidents.

CIV 432 (3) Bridge Design. Prerequisite: CIV 360. This course covers design of new bridges and evaluation of existing bridges in accordance with current American Association of State Highway and Transportation Officials (AASHTO) specifications. The procedures and requirements of bridge design and evaluation will be discussed, and the corresponding AASHTO code provisions will be explained through examples. Main topics include overview and history of bridge engineering, bridge design and evaluation methods and procedures, bridge superstructure design, bridge substructure design, fatigue and fracture of steel bridges, bridge load rating, advanced methods and technologies for bridge condition assessment, and case studies.

CIV 441 (3) Water and Wastewater Treatment Processes. Prerequisites: CHEM 141, CHML 141, CIV 340, CIVL 340. Theories, engineering principles, and design of modern water supply and wastewater treatment processes. Physical-chemical processes including screening, sedimentation, aeration, coagulation, flocculation, filtration, absorption, softening, and disinfection. Biological processes including activated sludge process and anaerobic processes for wastewater and sludge digestion, with emphasis on urban issues. Completion of a design project.

CIV 451 (3) Computer Methods in Civil Engineering. Prerequisites: MATH 368, and departmental approval. Fundamentals of analog and digital computers. Organization of problems for computational solution, flow charts, programming, simulation of nonlinear physical systems for application in engineering design, numerical methods in civil engineering. Case studies in civil engineering.

CIV 452 (3) Construction Project Management. Prerequisites: CIV 201, CIV 240, and CIV 355. The course covers the fundamental knowledge of Construction Management functions including Project Management, Cost Management, Time Management, Quality Management, Contract Administration, and Safety Management. Emphasis is placed on the application of each function throughout the project phases in developing problem-solving skills for real world engineering applications.

CIV 453 (3) Construction Estimating. Prerequisites: CIV 201, CIV 240, and CIV 355. The course covers the fundamental knowledge of quantity take-off and cost estimating of construction resources including materials, labor, and equipment. Topics include types of cost estimates, budget estimates, preconstruction services estimates, quantity take-off, self-performed work estimates, subcontractor work estimates, and bid preparation in developing problem-solving skills for real world engineering applications. Prerequisites: CIV 201, CIV 240, and CIV 355.

CIV 454 (3) Construction Scheduling. Prerequisites: CIV 355. This course aims to increase and improve the working knowledge of students in project scheduling and to train them as professional construction managers as stated in the program mission. Students will be provided an understanding of planning, scheduling, and monitoring of construction projects including development of critical path networks, Gantt bar charts and construction cost control and reporting practices. The students will also learn how to use the software tools to accurately prepare and analyze the project schedule and to effectively communicate the schedule to the management team. (Cross-listed with CIV 581)

CIV 455 (3) Building Information Modeling and Integrated Project Delivery. Prerequisite: CIV 355. This course covers the Building Information Modeling (BIM) and Integrated Project Delivery (IPD) approaches that address and resolve the perceived inefficiencies in the construction industry. BIM covers geometry, spatial relationships, geographic information, quantities, and properties of building components and can be used to demonstrate the entire building lifecycle including the processes of construction and facility operation. IPD deals with the integration of people, systems, business structures and practices into a single process and collaboratively harness the talents and insights of all participants on a particular construction project to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction. Cross-listed with CIV 585)

CIV 460 (3) Design of Environmental Engineering Facilities. Prerequisites: CIV 330, CIV 340 and CIVL 340. Analysis and design considerations for environmental engineering facilities such as water and wastewater treatment plants; physical engineering management of solid and hazardous waste, design constraints, resources recovery; biological processes; economical, ethical, societal and other professional considerations, urban issues, completion of a major design project.

CIV 461 (1) Professional & Ethical Issues in Civil Engineering. Prerequisites: senior standing in civil engineering. The task of this course is to reflect on the professional and ethical responsibilities of engineers, which can sometimes conflict with technical responsibilities. This course will articulate an ethical framework for engineers by critically reflecting on engineering practice and examining the ethical challenges that confront engineers working within teams and organizations. The course covers issues such as the social responsibility of engineers, attitudes, truth-telling and disclosure, whistle-blowing, contemporary issues, risk-assessment, and the importance of professional licensure.

CIV 465 (3) Advanced Water Resources Engineering. Prerequisite: CIV 370. Advanced engineering hydrology, advanced hydraulic structures, hydraulic similitude and modeling, wave

action, flow over spillways, optimization of water resources systems, design constraints, introduction to GIS applications to water resources engineering, completion of a major design project.

CIV 466 (3) Advanced Design of Hydraulic Structures. Prerequisite: CIV 370. Analysis and characteristics of flow in open channels (natural and artificial); channel design considerations including uniform flow (rivers, sewers), flow measuring devices (weirs, flumes), gradually varied flow (backwater and other flow profiles, flood routing), rapidly varied flow (hydraulic jump, spillways), and channel design problems (geometric considerations, scour, channel stabilization, sediment transport); analysis and design of hydraulic structures such as dams, spillways etc. based on economic, environmental, ethical, political, societal, health, urban issues, and safety considerations.

CIV 468 (3) Hazardous Waste Engineering. Prerequisite: CHEM 241, CHML 241, CIV 340, CIVL 340. Comprehensive study of the complex, interdisciplinary engineering principles involved in hazardous waste handling, collection, transportation, treatment, and disposal. Also covered are waste minimization, site remediation, and regulations important for engineering applications. Design constraints, engineering judgment, and ethical responsibility are covered. Contemporary hazardous waste issues and urban issues are also addressed.

CIV 470 (3) Urban Transportation Engrg System Design. Prerequisite: CIV 310, CIVL 311, CIV 390. Advanced design of highway systems, vehicle and driver characteristics, highway capacity, design of urban streets and expressways. Design constraints. Individual and team design projects oriented toward the solution of local urban transportation problems, societal and economical considerations.

CIV 471 (3) Principles of Geoenvironmental Engineering. Prerequisite: CIV 380.
Topics in geoenvironmental engineering in an urban environment. landfill design and incineration options. Stability of landfills, geotechnical characteristics of landfills, liner systems. Waste characterization, minimization, collection, treatment, transport and disposal. Leachate characteristics and potential groundwater contamination, design constraints. Legal and ethical considerations.

CIV 472 (3) Applied Geotechnical Engineering Design. Pre or co-requisite: CIV 430. Practical real life urban projects and advanced laboratory experience in geotechnical engineering, construction dewatering, construction issues, safety and economy, urban geotechnical engineering issues, preparation of subsurface investigation and geotechnical engineering reports, ethical considerations, oral presentation.

CIV 475 (3) Pavement Design. Prerequisite: CIV 380 and CIV 390. Aggregate, binder systems. Theory and design of pavement structures, rigid and flexible pavement design, subgrade materials, pavement management, nondestructive testing, pavement maintenance, design constraints, infrastructure maintenance, major design project.

CIV 476 (3) Advanced Design of Steel Structures. Prerequisite: CIV 360. Behavior and design of members subjected to fatigue, dynamic, combined loading. Methods of allowable design

stress, and load resistance factor design. Design of continues beams, plate girders, composite beams, open-web joists, connections, torsion and plastic analysis and design. Framing systems and loads for industrial buildings and bridges, design constraints and a major design project.

CIV 477 (3) Advanced Design of Concrete Structures. Prerequisite: CIV 420. Theory and design of reinforced concrete continuous beams, slender columns, two-way-slabs, footings, retaining walls, shear walls and multi-story buildings. Design for torsion and design constraints. Framing systems and loads for buildings and bridges, design constraints and a major design project.

CIV 478 (3) Design of Wood and Masonry Structures. Prerequisite: CIV 420. Engineering Properties and behavior of wood for analysis and design of wood beams, walls and diaphragms. Engineering properties and behavior of masonry for analysis and design of masonry walls, columns and shear walls. Framing systems and loads for multi-story buildings, design constraints and a major design project.

CIV 479 (3) Evaluation, Maintenance, and Rehabilitation of Public Works Infrastructure. Prerequisites: CIV 390, CIV 475. Evaluation, maintenance, and rehabilitation of deteriorated infrastructure systems by considering life cycle costs and long-term performance. Understanding rehabilitation alternatives in the practical field and designing rehabilitation schemes based on the non-destructive testing methods and economical considerations.

CIV 481 (3) Special Problems in Civil Engineering. Prerequisite: Departmental Approval. Individual investigation in a recognized major area of civil engineering of particular interest to the students that is not normally covered in regular courses. May include a co-op project.

CIV 491 (1-3) Internships in Civil Engineering I. Prerequisites: Junior or senior standing. Students work as interns with engineering firms or research laboratories to receive career-related training under the supervision of qualified engineers. The projects and tasks for the internship must be approved by both the work supervisor and the departmental instructor. Progress reports and final report in both writing and oral presentation are required. A minimum of 50 hours per credit is required.

CIV 492 (1-3) Internships in Civil Engineering II. Prerequisite: CIV 491. Continuation of the internship projects or tasks that the students conducted in the previous CIV 481 course and need more time to finish, or start of the second internship with engineering firms or research laboratories. The projects and tasks for the internship must be approved by both the work supervisor and the departmental instructor. Progress reports and final report in both writing and oral presentation are required. A minimum of 50 hours per credit is required.

Difference between General Civil Engineering and Environmental Engineering Concentrations

The curricula for the two concentrations are very similar to each other. For the Environmental concentration, two additional chemistry courses (CHEM 142 CHML 142 and CHEM 241) are required, and General Physics II (PHY 212 and PHYL 212) is not a required course.

Course No.	**Course Name**	**No. of Credits Include in General Civil Eng. Concentration**	**No. of Credits Included in Environ. Eng. Concentration**
PHY 212 & PHYL 212	General Physics II & Lab (4 Credits)	4	
CHEM 142 & CHML 142	General Chemistry II & Lab (4 Credits)		4
CHEM 241	Organic Chemistry I		3
CIV Electives	Civil Engineering Electives (9 or 12 Credits)[a], See below.	15	12
Total No. of Credits		19	19

Requirements Civil Engineering Electives for Each Concentration:

General Civil Engineering Concentration:

At least one civil engineering elective must be chosen from CIV 441 or CIV 460. At least one civil engineering elective must be chosen from CIV 431, CIV 470, CIV 475 or CIV 479. The selection of other courses requires the approval of the adviser and Dept. Chair.

Environmental Engineering Concentration:

At least two civil engineering electives must be chosen from CIV 441, CIV 460, CIV 468, or CIV 471. At least one civil engineering elective must be chosen from CIV 431, CIV 470, CIV 475 or CIV 479. The selection of other courses requires the approval of the adviser and Dept. Chair.

The students are required to contact their advisers or Department Chair prior to taking any civil engineering elective.