PROGRAM HANDBOOK

Department of Civil and Environmental Engineering

120-CREDIT CE PROGRAM

ACADEMIC YEAR
2023-2026

MORGAN STATE UNIVERSITY

MORGAN STATE UNIVERSITY

SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL AND

ENVIRONMENTAL ENGINEERING

2023-2026

HANDBOOK FOR CE UNDERGRADUATE PROGRAM

A Welcome Letter from the Department Chair:

Congratulations on your being accepted into the civil engineering or sustainable urban environmental engineering program in the School of Engineering! On behalf of the Department of Civil and Environmental Engineering family (faculty and staff), I extend a warm welcome to you on the first leg of your professional engineering journey. Your bachelor's degree in civil engineering will serve as the foundation for a lifetime of learning and the practice of civil engineering. Further, it will serve also as a vital building block in your efforts to attain master and doctoral degrees in civil engineering, if you decide to pursue them.

We have set high standards in the Department of Civil and Environmental Engineering. Therefore, I encourage you to interact with your fellow engineering students (particularly with those students who are striving to do well in their studies), take advantage of extra study sessions, and attend tutoring sessions (when necessary). Your civil engineering education at Morgan State University will be built on the following six civil engineering sub-disciplines: environmental engineering, geotechnical engineering, hydraulic/hydrological engineering, structural engineering, and transportation engineering. A thorough grounding in these five major concentrations will provide you with an excellent background for other areas of civil engineering. Likewise, it is important for you to know that the American Society of Engineers has gone on record as endorsing the concept of the Master's degree or Equivalent as a prerequisite for the practice of civil engineering at the professional level means to practice as a licensed Professional Engineer (PE). "No other engineering discipline requires that licensure as a Professional Engineer serves as a prerequisite to the sustained practice of civil engineering at the professional level." Moreover, a world-class civil engineering education requires world-class facilities. MSU's Department of Civil and Environmental Engineering occupies with the School of Architecture and Planning, the Department of Transportation and Urban Infrastructure Studies, and the National Transportation Center, a new $63,000,000 LEEDS Gold Certified building with 15 civil engineering undergraduate, graduate, and faculty laboratories which include an earthquake shake table (which can move in 6 directions) and two wind tunnels both (subsonic and supersonic).

Welcome aboard for what I am certain will be an enriching educational experience if you honestly apply toward the educational task at hand.

Yours Sincerely,

Jiang Li, Ph.D., P.E., P.HG, D.WRE, F.EWRI, F.ASCE
Chair and Professor of Department of Civil and
Environmental Engineering US-DOE Samuel P. Massie
Chair of Excellence

PROGRAM HANDBOOK FOR CE STUDENTS

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1. DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

The Department of Civil and Environmental Engineering provides two BS (in CE and SUEE) programs of study in the planning, design, and management of civil and environmental infrastructure and service systems. In the CE program, specialty areas of study include transportation engineering, environmental and water resources engineering, structural engineering, geotechnical engineering, hydrology and hydraulic engineering, and construction engineering and management. In the SUEE program, the special area centers in Environmental Engineering, particularly the special topics on urban environmental issues, such as water and wastewater, solid and hazardous waste, air pollution and control, stormwater management, surface and subsurface water solute transport and contamination, etc.

The educational programs in Civil and Environmental Engineering ensure that students acquire the ability to master fundamental principles of engineering which may be applied effectively to benefit society. All efforts of the faculty and administration are directed at developing the students' potential and preparing them to assume leadership roles in their chosen profession.

1.1 Accreditation

Morgan State University is fully accredited by the Middle States Association of Colleges and Secondary Schools. The Civil Engineering Program was founded in 1984. The civil engineering undergraduate program is accredited by the Engineering Accredited Commission of ABET, http://www.abet.org

1.2 The Major in Civil Engineering

The DCEE provides a program of study in the planning, design and management of civil infrastructure and service systems. All students have the opportunity to apply mathematical and physical concepts to engineering problems through laboratory and design experiences. In addition to the strong design experience integrated throughout the required courses, the Department also offers studies in six special subareas through the electives so that students can enhance their skills with additional open- ended problem solving. The problems are broad-based, incorporating knowledge from the seven special subareas, including structural engineering, geotechnical engineering, transportation engineering, environmental engineering, hydraulic/hydrological/water resources engineering, construction engineering and management, and civil engineering systems.

1.3 Objectives of the Civil Engineering Program

The primary objectives of the DCEE are consistent with those of the School of Engineering and listed as follows:

- Establish a Civil Engineering Program of the first rank.
- Instill in its students the confidence and competence required to meet the challenges associated with careers in engineering.

- Produce competitive engineers who have negotiated a well-balanced curriculum based on regional and national accreditation guidelines.
- Exhibit educational leadership in accomplishing the task of increasing the representation of African Americans and others who are underrepresented among engineering professionals.

The Program Educational Objectives of the DCEE are to: row the number of graduates from the program that assume top managerial and leadership roles in their chosen professional careers;

- Assume managerial and/or leadership roles in their chosen professional careers within six years of graduation (e.g. project manager, project engineer, etc.).
- Be employed and function well in the civil engineering system and processes, and STEM related areas.
- Make contributions that advance the current state-of-the-practice in technology and/or research of civil engineering systems and processes; and
- Continue their professional development through continuous improvement and life-long learning (e.g. graduate school, professional engineering (PE) licensure, professional certifications, etc.).

2. OUTCOMES OF CIVIL ENGINEERING PROGRAM (STUDENT OUTCOMES)

The CE program outcomes serve as specific guidelines and standards of the core knowledge, skills and abilities, that students are expected to achieve by the time of graduation. The outcomes also indicate the minimum standards of achievement for students matriculating through the program. The Department will produce students who are able to facilitate innovation and synthesis of new products and services, as well as improve existing products, in a global context; become leaders and/or major contributors in their profession, community and organizations; continue the learning process throughout their careers; remain effective in their employment in engineering and other professional career fields; provide service to their profession and community-at-large.

The outcomes of the Civil Engineering Program in School of Engineering at Morgan State University are closely aligned with the guidelines of the ABET for the accredited engineering programs. All graduates from the B.S.C.E. Program will demonstrate:

(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
(3) an ability to communicate effectively with a range of audiences.

(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economics, environmental, and societal contexts.
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

3. STUDENT ADVISING IN CIVIL ENGINEERING

Getting proper advisement for the undergraduate program is essential to one's success in graduating on time, as well as being intellectually prepared to pursue his/her next endeavor in life, whether that is a pursuing a higher degree in the field or a career as a civil engineer.

The Department will pay close attention to the progress made by the CE's students in the curriculum. During undergraduate study, registration for courses will be allowed only with the approval of CE's advisors. A student needs to fill out an advisement form (via DocuSign Form) and get advisor's signature on that form. Later the support staff of the school will remove the advising hold from a student's account so that he/she can register for the classes you have been advised for. The link of the DocuSign form is provided in the section 3.7. For students who are to change his/her major/minor and academic catalog, the sample forms are included in Appendix B of this Handbook.

Each student will be assigned an academic advisor who will play a significant role in the educational development of the civil engineering major. Students can find their faculty advisor assigned by the department office through the blackboard. The faculty advisor approves all course schedules and any changes that are made and provides vital information about the civil engineering program's curriculum, courses, activities, and provides guidance to the student in preparing course schedules. Students are encouraged to get to know their advisors as early as possible as it is beneficial for students' success in accomplishing their goals through the civil engineering program.

3.1 Freshman Student (Fall Semester)

- Take placement test and get profile report as part of ACCESS Orientation Program or as part of PACE at end of the program. The information of ACCESS can be found by clicking the link below:

  https://www.morgan.edu/access

  and the instructions of the online registration are given in the following PDF file:

  https://www.morgan.edu/Documents/ADMINISTRATION/OFFICES/retention/Acces sOrientation/ACCESSOnline-RegInstructions2022.pdf

- Report to engineering orientation as a group with profile report and sign roster for the major department; pick up SOAR booklet; submit profile report for copies (retention and department)
- Complete engineering orientation in S241
- Break up by major and go to departments for advising.
- See your advisor in the CEE department for advising.
- After advisement go to computer lab with advising form and Accuplacer profile to the registration area
- Register with assistance from retention staff and student assistants.
- Submit copies of schedule, student account summary and advising form - class schedule is checked to verify that students have registered in accordance with advisement form.
- Copies of schedule, advisement form, student account summary sent to department
- Students who need assistance with math course registration - see Ms. Myra Curtis
- Students with advisor holds - see Ms. Curtis
- Students with admission hold/financial hold - see Dr. Poindexter or Ms. Curtis

3.2 Freshman Student (Spring Semester)

- Complete ACCESS Orientation. The information of ACCESS can be found by clicking the link below:

  https://www.morgan.edu/access

  and the instructions of the online registration are given in the following PDF file:

  https://www.morgan.edu/Documents/ADMINISTRATION/OFFICES/retention/Acces sOrientation/ACCESSOnline-RegInstructions2022.pdf

- Take placement test and retrieve profile report.
- Report to engineering orientation with profile report and sign roster for the major department; pick up SOAR booklet; submit profile report for copies (retention and department)
- Complete engineering orientation in S241
- Break up by major and go to departments for advising.
- See Dr. Jiang Li in the CEE department for advising.

- After advisement go to computer lab with advising form and ALEKS profile to registration area
- Register with assistance from Engineering Student Support Services staff and student assistants.
- Submit copies of schedule, student account summary and advising form - class schedule is checked to verify that students have registered in accordance with advisement form to soeregistration@morgan.edu.
- Copies of schedule, advisement form, student account summary sent to department via email.

3.3 Transfer Student (Fall and Spring Semesters)

- Complete MSU Transfer Orientation
- Report to engineering and sign roster for major department
- Complete engineering transfer orientation
- See Dr. Monica Poindexter for School of Engineering Credit Evaluation or
- Take mathematics placement test if needed (given in engineering)
- Return to orientation area with credit evaluation.
- Return to orientation area with ALEKS profile.
- See Dr. Oludare Owolabi (Oludare.owolabi@morgan.edu) in the CEE department for advising.
- Return to orientation area with the advisement form.
- Report to the computer lab to get assistance with registration.
- Submit copies of schedule, student account summary and advising form - class schedule is checked to verify that students have registered in accordance with advisement form to soeregistration@morgan.edu
- Copies of schedule, advisement form, student account summary sent to department via email.

3.4 Late Registration for Freshmen

- Take placement test and get profile report.
- Report to Dr. Poindexter's office for processing before going to the department.
- See Dr. Owolabi (oludare.owolabi@morgan.edu) in the CEE department for advising.
- Return to Ms. Myra Curtis for assistance with registration.
- When registration is complete, report to Dr. Poindexter's office for checkout.
- Students who need assistance with math course registration see Dr. Poindexter
- Students with advisor holds can see Dr. Poindexter (contact: soeadv@morgan.edu)

3.5 Late Registration for Transfer Students

- Report to Dr. Poindexter office for processing before going to the department.
- Upload all transcripts to the website for evaluation.
- Check the online feedback for the credits evaluation for general education and university requirements

- Email soetransfer@morgan.edu to request an evaluation of engineering courses.
- See Dr. Hunter (james.hunter@morgan.edu) in the CE department for advising.
- Return to Dr. Poindexter (monica.poindexter@morgan.edu) for assistance with registration.
- When registration is complete, submit copies of schedule, student account summary and advising form - class schedule is checked to verify that students have registered in accordance with advisement form to: soeregistration@morgan.edu

3.6 Override Request

If a student needs an override for a session that is closed due to oversize, he needs to initiate an electronic override request and files an online override form by clicking the link below:

https://searchlightpa.com/SearchLight/Survey.asp?hIDX=8f53295a73878494e9bc8dd6c3c7104f

After you submit the online form, the request will be sent to you for confirmation and the course instructor for his or her approval.

3.7 Student Advisement

Each CE student has been assigned a CE faculty member as an advisor who can help the CE student to develop a study plan. The following link leads to a DocuSIGN form for advisement. The student needs to fill the form with his/her name and email address as well and his/her advisor's. After his/her advisor's review and signature, the student's plan can be approved and his/her "hold" can be removed. A student can contact: soeadv@morgan.edu for his/her status after filing the e-form.

https://na2.docusign.net/Member/PowerFormSigning.aspx?PowerFormId=a4e5f263-d284-49a0-809d-1305e62696c1

4. REQUIRMENT FOR THE BACHELOR OF SCIENCES IN CIVIL ENGINEERING

A minimum of 120 credit hours are required of students pursuing the Bachelor of Science Degree in Civil Engineering (B.S.C.E.). These credit hours are distributed as follows:

Table 1: Requirements for 120-Credit Hours

Course Category	Credit
General Education and University Requirements – Group A	45
Mathematics and Science Requirements – Group B	25
Civil Engineering Core Requirements – Group C	50
Total	120

CE students must complete all of the required courses in Groups A, B and C in Table 1 for the degree of B.S.C.E.

4.1 Group A- General Education and University Requirements

Group A is General Education and University Requirements with a total of 45 credits. General education requirements are set by the university (Table 2). Students need to take these courses from the relevant departments in various schools. Descriptions of these courses can be found in the department catalogs at Morgan's website: http://www.morgan.edu/academics/academic_catalogs.html

Table 2: General Education and University Requirements – Group A

Course #	Course Title	Credit
BIOL 101	Introduction to Biology (BP)	4
CEGR 107	Computer-Aided Engineering Graphics, Analysis & Design (IM)	3
ECON 211/212/SB	Principles of Economics I/II	3
ENGL 101	Freshman Composition I (EC)	3
ENGL 102	Freshman Composition II (EC)	3
HEED 103/HH	Health Education (HH)	3
HIST 101/105/SB	World History I/History of the U.S. (SB)	3
HIST 350	Introduction to African Diaspora(CI)	3
HUMA 201/AH	Introduction to Humanities I (AH)	3
OREN 104	Freshmen Orientation for School of Engineering	1
MATH 241	Calculus I (MQ) (prerequisite: MATH 114 or MATH 141)	4
PHEC XXX/PE	Physical Education	1
PHIL 109/CT	Introduction to Logic (CT)	3
PHIL 220/AH	Ethics and Values (AH)	3
PHYS 205+205L	University Physics I + Lab (BP)	5
Total	General Education and University Requirements	45

Note:

- *AH-Arts and Humanities; CT-Critical Thinking; SB-Social and Behavioral Science; HH- Health and Healthful Living; PE-Physical Education.*
- *ECON211/212 cannot be replaced by other SB courses as it is a supportive course.*
- *Courses in Group A in red are supportive courses and require a C or better grade to pass.*

Though the approved general education courses can be found on Morgan's website, one should refer those posted in the degree work, see the link below for the website:

https://www.morgan.edu/school_of_computer_mathematical_and_natural_sciences/departments_and_programs/chemistry/undergraduate_program/general_education_requirements.html

4.1.1 Approved Arts and Humanities Electives (AH) for Group A

As Group A indicated in Table 2, HUMA 201 and PHIL 220 may be substituted by any approved Arts and Humanities Electives (AH) listed in Table 2. Students in CE must select two courses from different disciplines shown in Table 3 for a total of 6 credits.

Table 3: Approved Arts and Humanities Electives (AH) for Group A

Course #	Course Title - Approved AH courses	Credit
ART 308	The Visual Arts	3
COMM 203	Media Literacy in a Diverse World	3
HUMA 211	Introduction to Humanities I Honors	3
HUMA 202	Introduction to Humanities II	3
HUMA 212	Introduction to Humanities II Honors	3
HUMA 301	Contemporary Humanities	3
MUSC 391	The World of Music	3
MISC 302	Introduction to Military Training	3
PHEC 300	Selected Roots of Afro-American Dance	3
RELG 305	Introduction to World Religions	3
THEA 312	Black Drama	3
FL 102 +	Foreign Language 102 or higher	3
Remark: total required AH – 6 credits. Students must select two courses from different disciplines in the AH distribution area. Please refer the degree work for updates		

4.1.2 Approved Social and Behavioral Science Electives (SB) for Group A

HIST 101/105 in Group A (in Table 2) may be substituted by any approved Social and Behavioral Science Electives (SB). Students in CE must select two courses from different disciplines listed in Table 4 with a total of 6 credits.

Table 4: Approved Social and Behavioral Science Electives (SB) for Group A

Course #	Course Title -Approved SB courses	Credit
HIST 102	World History II	3
HIST 106	History of the United States II	3
HIST 111	World History I – Honors	3
HIST 112	World History II – Honors	3
HIST 115	History of the United States I– Honors	3
HIST 116	History of the United States II– Honors	3
MHTC 103	Introduction to Group Dynamics	3
MISC 301	Introduction to Team & Small Unit Operations	3
POSC 201	American Government	3
POSC 206	Black Politics in America	3
PSYC 101	General Psychology	3
PSYC 111	General Psychology – Honors	3
SOCI 101	Introduction to Sociology	3
SOCI 110	Introduction to Anthropology	3
SOSC 101	Introduction to the Social Sciences	3
Remark: total required SB – 6 credits. Students must select two courses from different disciplines in the SB distribution area. Please refer the degree work for updates.		

4.1.3 Approved Physical Education Electives in Group A

PHEC XXX (Physical Education) in Group A (in Table 2) may be selected from Table 5 approved by the University. CE students must select at least one course (one credit) from Table 5 to meet the General Education and University Requirements.

Table 5: Approved Physical Education (PE) Electives in Group A

Course #	Credits	Course #	Credits	Course #	Credits
PHEC 036	1	PHEC 128	1	PHEC 230	1
PHEC 037	1	PHEC 130	1	PHEC 240	1
PHEC 101	1	PHEC 140	1	PHEC 250	1
PHEC 102	1	PHEC 144	1	PHEC 255	1
PHEC 107	1	PHEC 148	1	PHEC 260	1
PHEC 117	1	PHEC 160	1	PHEC 271	1
PHEC 118	1	PHEC 170	1	PHEC 276	1
PHEC 119	1	PHEC 190	1	PHEC 290	1
PHEC 120	1	PHEC 201	1	PHEC 320	1
PHEC 121	1	PHEC 202	1	PHEC 322	1
PHEC 122	1	PHEC 207	1	PHEC 327	1
PHEC 123	1	PHEC 210	1	PHEC 340	1

PHEC 124	1	PHEC 214	1	PHEC 390	1
PHEC 125	1	PHEC 220	1	PHEC 421	1
PHEC 126	1	PHEC 221	1	PHEC 428	1
PHEC 127	1	PHEC 226	1	PHEC 490	1

Remark: total required PE – 1 credit. Please refer the degree work for updates.

4.1.4 Approved Health and Healthful Living Electives (HH) in Group A

The course HEED 103 in Group A (in Table 2) may be substituted by any Health and Healthful Living Electives (HH) in Table 6, which are approved by CEE department. Students in CE must select at least one course from Table 6 for 3 credits to meet the requirement of general education.

Table 6: Approved Health and Healthful Living Electives (HH) in Group A

Course #	Course Title -Approved SB courses	Credit
HEED 160	Introduction to Nutrition	3
HEED 203	Personal and Community Health	3
Remark: total required HH – 3 credits. Please refer the degree work for updates.		

4.1.5 Approved Critical Thinking Electives (CT) in Group A

The course PHIL 109 in Group A (in Table 2) may be substituted by any approved Critical Thinking Electives (CT) in Table 7, which are approved by CE department. Students in CE must select at least one course from Table 7 for 3 credits to meet the requirement of general education.

Table 7: Approved Critical Thinking Electives (CT) in Group A

Course #	Course Title -Approved SB courses	Credit
PHIL 119	Introduction to Logic Honors	3
Remark: total required CT – 3 credits. Please refer the degree work for updates.		

4.2 Group B-Math and Basic Science Requirements

Group B is a group courses for the Mathematics and basic Science Requirements (a total of 25 credits) for undergraduate students in Civil Engineering. Table 8 shows the list of courses in Group B for the civil engineering program. CE students need to take these courses in the respective departments. Description of the courses may be found in the department catalogs at:

http://www.morgan.edu/academics/academic_catalogs.html

Table 8: Group B- Math and Basic Science Requirements

Course #	Course name	Credit	Prerequisites	Co-requisites
CEGR 307	Computer Method & Programming for Civil Engineering	2	MATH 243, MATH 340, CEGR 107	PHYS 206, PHYS 206L
CHEM 110	General Chem. for Eng. (BP)	4	None	None
MATH 242	Calculus II	4	MATH 241	None
MATH 243	Calculus III	4	MATH 242	None
MATH 340	Differential Equations	3	MATH 242	None
MATH 331 /IEGR 251	Probability and Statistics	3	MATH242/ MATH 241	None
PHYS 206, PHYS 206L	University Physics II + Lab	5	PHYS 205, PHYS 205L, MATH 242	MATH 243
Remark: total required Mathematics and Basic Science Requirements – 25 credits. Please refer to the degree work for updates.				

4.3 Group C-Core Requirements by Civil Engineering

Group C is the group of core courses required by Civil Engineering (50 credits). Table 9 shows the list of the courses as the main requirements for all undergraduate students in the CE program. Catalog descriptions for these courses may also be found in the CATALOG OF CIVIL ENGINEERING.

Table 9: Group C -Required CE Core Requirements (50 Credits)

Course #	Course name	Credit	Prerequisites	Co-requisites
CEGR 106	Introduction to Civil Engineering	1	None	None
CEGR 110	Survey Technologies in CE.	2	None	None
CEGR 202	Statics	3	PHYS205, PHY205L	MATH 242
CEGR 212	Mechanics of Materials & Lab	3	CEGR 202	None
CEGR 214	Fluid Mechanics and Lab	3	MATH 243, CEGR 106	CEGR 110,MATH 340
CEGR 302	Dynamics	3	CEGR 212	None
CEGR 324	Structural Analysis I & Lab	3	CEGR 212	None
CEGR 325	Geotechnical Engineering Fundamentals & Lab	3	CEGR 212	None
CEGR 332	Hydraulic/Water Recourses Eng.	3	CEGR 214	None
CEGR 338	Environmental Eng. I & Lab	3	BIO 101, CHEM 110, CEGR 214	None
CEGR 400	Project Management, Finance Entrepreneurship	2	ECON 211/212, IEGR	None

			251/MATH 331	
CEGR 416	Transportation Engineering	3	ECON 211/212	CEGR 325
CEGR 436	Elementary Structural Design	3	CEGR 324	None

CEGR 492	Senior Design Project I	2	CEGR 325, CEGR 332, CEGR 338, CEGR 416	CEGR 436, CEGR 307
CEGR 493	Senior Design Project II	1	CEGR 492	None
XXX 4XX -CE	3 approved in the elective list	9	see the catalog for the detail information	None
XXXX. XXX	IEGR305, EEGR 310, ARCH 303, CMGT 201, TRSS 318/ 415	3	Various (see catalog)	various (see catalog)
Remark: total required core courses in Civil Engineering – 50 credits. Please refer the degree work for Updates.				

Note: Though CEGR 492 and CEGR 493 may be substituted by CEGR 496, CEGR 496 is not allowed unless a student in the 4+1 Dual BS Degrees Program in CE and AAE between MSU and PU OR an exceptional circumstance with the approval by Chairman of the CEE department.

The Department of Civil and Environmental Engineering offers various elective courses which distributed in six sub-disciplines, i.e., transportation engineering, geotechnical engineering, environmental engineering, structural engineering, construction engineering and management, civil engineering systems. After completion of the majority of CE core requirements, a CE student must take at least three elective courses (9 credits) from a specific area listed in Table 10. All of these courses are numbered as CEGR 4XX (400+ level) and often referred to as senior elective courses in the department. These courses are offered periodically or offered as needed according to the number of the CE students interested in. It is highly suggested that one plans ahead and selects at least three elective courses after discussing your plans with your academic advisor.

Table 10: CEGR 4XX (9 Credits) from CE Elective Courses in 6 Different Subareas

Course #	Course name	Credit	Prerequisites	Co-requisites
TRANSPORTATION ENGINEERING				
CEGR 465	Traffic Engineering	3	CEGR 416	None
CEGR 466	Transportation Models and Simulation	3	CEGR 416	None
CEGR 467	Transportation Infrastructure Engineering Systems	3	CEGR416	None
CEGR	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None

498				
STRUCTURAL ENGINEERING				
CEGR 450	Structural Analysis II	3	CEGR 324	None
CEGR 451	Design of Concrete Structures	3	CEGR 436	None
CEGR 452	Design of Steel Structures	3	CEGR 436	None
CEGR 453	Reliability-based Design in Civil Engineering	3	MATH 331/IEGR 251	None
CEGR 498	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None
GEOTECHNICAL ENGINEERING				
CEGR 454	Foundation Engineering	3	CEGR 325	None
CEGR 455	Seepage, Drainage, and Groundwater	3	CEGR 325	None
CEGR 456	Earth Structures and Slopes	3	CEGR 325	None
CEGR 457	Geotechnical Engineering	3	CEGR 325	None
CEGR 498	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None
ENVIRONMENTAL ENGINEERING				
CEGR 458	Biological Wastewater Engineering	3	CEGR 332, CEGR 338	None
CEGR 459	Water Supply Engineering	3	CEGR 332, CEGR 338	None
CEGR 460	Hazardous Waste Management	3	CEGR 332, CEGR 338	None
CEGR 463	Physical-Chemical Treatment of Water and Wastewater	3	CEGR 332, CEGR 338	None
CEGR 464	Environmental Engineering II	3	CEGR 332, CEGR 338	None
SUEE 350	Air Pollution Control	3	CEGR 338/SUEE 338	None
SUEE 430	Environmental Chemistry	3	CEGR 338/SUEE 338	None
CEGR 498	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None
CONSTRUCTION ENGINEERING AND MANAGEMENT				
CEGR 471	Mechanical and Electrical Facilities	3	PHYS 206, PHYS206L, CEGR 400	None
CEGR 475	Fundamentals of Construction Engineering and Management	3	CEGR 307, CEGR 400	None
CEGR 476	Construction Economics	3	CEGR 307, CEGR 400	None
CEGR 477	Fundamentals of Construction Estimating	3	CEGR 307, CEGR 400	None
CEGR 498	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None
CIVIL ENGINEERING SYSTEMS				

CEGR 467	Transp. Infrastructure Eng. System	3	CEGR 416	None
CEGR 470	Energy Efficiency in Buildings	3	PHYS 206, PHYS 206L, CEGR 400	None
CEGR 471	Mechanical and Electrical Facilities	3	PHYS 206, PHYS 206L, CEGR 400	None
CEGR 480	Fundamentals of Geographic Information Systems	3	CEGR 110,CEGR 307	None
CEGR 481	Fundamentals of Remote Sensing	3	CEGR 110,CEGR 307	None
CEGR 498	Topics in Civil Engineering	3	Senior Standing with 90 credits +	None
Remark: total required CEGR 4XX – 9 credits, of which 3 credits required from the group of Transportation Engineering.				

In addition to three elective courses (XXXX.XXX CE Track), the senior students in CE are also required to take a relevant advance courses (3 credits, multidisciplinary) offered by Department of ECE or IE, which is listed in Table 11 below (i.e., XEGR XXX).

Table 11: XEGR XXX or TRSS XXX (3 Credits) Elective Courses from SOE

MULTIDISCIPLINARY ENGINEERING ELECTIVE FROM ECE AND IE				
Course #	Course name	Credit	Prerequisites	Co-requisites
EEGR 310	Principles of Electronics	3	MATH340,PHYS206,PHYS206L	None
ENGR 310	Professional Practicum	3	None	None
IEGR 305	Thermodynamics	3	MATH242,PHYS206,PHYS206L	None
SUEE 220	Introduction of Urban Sustainability	3	CEGR 110	None
TRSS 318	Transportation Planning and Policy	3	None	None
TRSS 415	Highway Engineering	3	TRSS 301 or permission from instructor, MATH 241	None
ARCH 303	Sustainability	3	None	None
CMGT 201	Construction Methods I	3	None	None
Remark: total required XEGR XXX or TRSS XXX– 3 credits. Please refer the degree work for updates.				

Note: Faculty advisor and Department Chair's written approval may be required prior to registration for the approved elective courses.

5. SAMPLE PROGRAM FOR CIVIL ENGINEERING STUDENTS

Table 12 shows a suggested plan of study for CE students, starting with Calculus I (MATH241). If a student starts with a lower-level mathematics course, e.g., MATH 106, MATH 113, MATH 114, MATH 141, ENGR 101, or ENGR 102, the student will need to see the freshman advisor to adjust his or her schedule for the first semester.

If a student starts with a lower-level course in mathematics, it is highly suggested that he or she take a summer or winter mathematics class to catch up to this schedule.

Table 12: Sample Program for CE Freshman with MATH 241

First Semester		Credits	Second Semester		Credits
FRESHMAN YEAR					
OREN 104	Freshman Orientation for Engineering	1	CEGR 106	Introduction to Civil Engineering	1
CEGR 107	Computer Aided Engineering Graphics, Analysis & Design	3	CEGR 110	Survey Technologies in CE	2
BIOL 101	Introduction to Biology I	4	MATH 242	Calculus II	4
MATH 241	Calculus I	4	ENGL 102	Freshman Composition II	3
			PHEC XXX[5]	Physical Education	1
ENGL 101	Freshman Composition I	3	PHYS 205 +PHYS 20	University Physics + Lab	5
TOTAL		15	TOTAL		16
SOPHOMORE YEAR					
CEGR 202	Statics	3	CEGR 212	Mechanics of Materials & Lab	3
ECON 211 OR	Principles of Economics I	3	CEGR 214	Fluid Mechanics & Lab	3
ECON 212	Principles of Economics II		CHEM 110 + CHEM110L	Gen Chem. for Eng.	4
MATH 243	Calculus III	4	MATH 340	Intro to Differential Equations	3
PHYS 206+ PHYS 206L	University Phys II+Lab II	5	HUMA 201[3]	Introduction to Humanities I	3
SUBTOTAL		15	SUBTOTAL		16
JUNIOR YEAR					
CEGR 324	Structural Analysis I and Lab	3	CEGR 302	Dynamics	3
CEGR 325	Geotechnical Engineering & Lab	3	CEGR 332	Hydraulic/Water Resources Engineering	3
CEGR 307	Computer Methods & Programming for CE	2	CEGR 338	Environmental Engineering & Lab	3
CEGR 416	Transportation Engineering	3	PHIL 220[3]	Ethics & Values	3
MATH 331	Probability and Statistics OR	3	HEED 103[2]	Healthful Living	3
IEGR 251	Probability and Statistics for Eng I		CEGR 400	Project Management, Finance & Entrepreneurship	2
SUBTOTAL		14	SUBTOTAL		17
SENIOR YEAR					
CEGR 492	Senior Review and Project Proposal	2	CEGR 493	Senior Project	1

XXXX XXX[6] CE	Civil Engineering Technical Elective	3	XXXX XXX -CE	Civil Engineering Technical Elective	3
XXXX XXX[7]	Multidisciplinary Engineering Elective	3	XXX.XXX - CE	Civil Engineering Technical Elective	3
			HIST 101[1]	World History	3
CEGR 436	Elementary Structural Design	3		OR	
			HIST 105[1]	History of U.S.	
PHIL 109[4]	Introduction to Logic	3	HIST 350	Introduction of African Diaspora	3
SUBTOTAL		14	SUBTOTAL		13
				TOTAL CREDIT HRS	120

Remark: please refer Tables 4.1.1 – 4.1.5 for the approved electives,
[1]May be substituted by any approved Social and Behavioral Science Electives (SB) except for ECON 211/212.
[2]May be substituted by any approved Health and Healthful Living Electives (HH).
[3]May be substituted by any approved Arts and Humanities Electives (AH).
[4]May be substituted by any approved Critical Thinking Electives (CT).
[5]May be substituted by any approved Physical Education Electives (PE).
[6]A CE student must take courses from the approved CE tracks
[7] XXXX XXX Multidisciplinary Electives must be taken from the approved course group.

6. CIVIL ENGINEERING CURRICULUM SEQUENCE FLOWCHART

The flowchart below indicates the courses sequence in CE curriculum for all students who have entered the B.S. program of the DCE in or after the fall semester in 2022.

As shown in the flowchart, solid and dotted lines with arrows represent the prerequisite and co-requisite course relations, respectively.

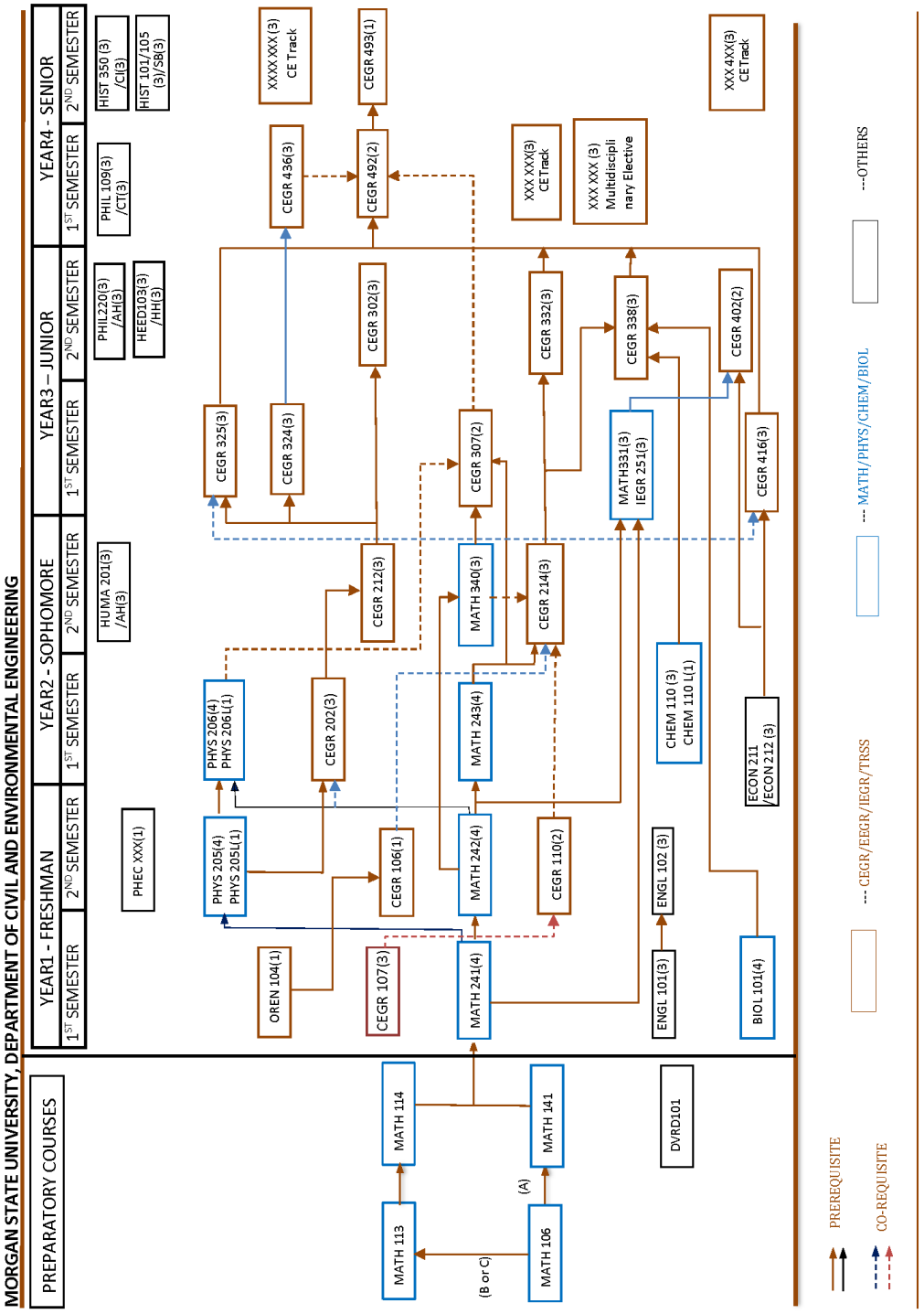

Figure 1: A Typical Curriculum Sequence Flowchart

7. SUGGESTED COURSE SELECTION FOR THE FIRST SEMESTER (1ST TIME FRESHMEN)

All first-time freshmen at Morgan State University are required to take a placement examination to determine their course placement. Students are tested in the areas of English, Reading, and Mathematics. Based upon their test results, students will take either Freshman Studies English 101 or Standard College level English 101, either Developmental Math (Math-106) or Pre-Calculus (Math-113 or Math-141), and students may be required to take Development Reading (DVRD 101). An advanced mathematics placement for courses up to Calculus (Math 241) is available for students majoring in the sciences, engineering, and mathematics. Students are required to take courses as indicated by the results of their placement examination. Students must earn grades of "C" or better in all developmental courses.

In particular, first-time freshmen students are required to take the MSU ACCUPLACER Math Placement Test in July or August. The results of the Math Placement Test are used to determine student's mathematics course placement in either Developmental Math (Math-106), or Pre-Calculus (Math-113 and 114 or Math-141), or Calculus I (Math-241). Different study plans for the first semester are shown below as four examples. It should be emphasized that the final schedule must be approved by the assigned freshmen advisors or the Chair of the Department of Civil and Environmental Engineering.

Table 13: First Semester Suggested Course Selections

Calculus- Ready (MATH 241)			Pre-Calculus Entry (MATH 141)		
Course #	Course name	Credit	Course #	Course name	Credit
OREN 104	FRESHMAN ORIENTATION	1	OREN 104	FRESHMAN ORIENTATION	1
MATH 241	CALCULUS I	4	MAT141	PRE-CALCULUS	4
ENGL 101	FRESHMAN COMPOSITION I	3	ENGL101	FRESHMAN COMPOSITION I	3
CEGR 107	COMPUTERAIDED ENG. GRAPH, ANALYSIS & DESIGN	3	CEGR107	COMPUTERAIDED ENG. GRAPH, ANALYSIS & DESIGN	3
BIOL 101	INTRODUCTION TO BIOLOGY	4	BIOL101	INTRODUCTION TO BIOLOGY	3
TOTAL		15	TOTAL		15

Pre-Calculus Entry (MATH 113)			Developmental Math Entry (MATH 106)		
Course #	Course name	Credit	Course #	Course name	Credit
OREN 104	FRESHMAN ORIENTATION	1	OREN 104	FRESHMAN ORIENTATION	1
MATH 113	MATH ANALYSIS I	4	MATH 106	FUNDAMENTALS OF MATH	3
ENGL 101	FRESHMAN COMPOSITION I	3	ENGL 101	FRESHMAN COMPOSITION I	3
BIOL 101	INTRODUCTION TO BIOLOGY	4	BIOL 101	INTRODUCTION TO BIOLOGY	4
CEGR 107	COMPUTERAIDED ENG. GRAPH, ANALYSIS & DESIGN	3	CEGR 107	COMPUTERAIDED ENG. GRAPH, ANALYSIS & DESIGN	3
TOTAL		15	TOTAL		14

8. EXPECTATIONS FOR EACH STUDENT

All students in the Department of Civil and Environmental Engineering are expected to conduct themselves accordingly, exhibiting a standard of professionalism and engineering ethics which is representative of the Department and School. Students are expected to show respect for faculty, be in attendance to all of classes, be on time and do assignments in a professional and ethical manner.

8.1 Expectation for students' academic performance in the B.S.C.E program

It is important for students to adhere to course pre-requisites. Do not rely only on the computer to determine pre-requisites, but rather use the CE's catalog and handbook for assistance. Unsatisfactory grades in courses should be repeated immediately.

The students must pass all required courses with a grade of "C" or better, including all the courses listed in Groups B and C and supportive courses in Group A (in red). In particular, the School of Engineering does not award the D grade in its courses in Group C. For courses beginning in "EEGR," "CEGR,", "SUEE", and "IEGR", only grades of A, B, C, and F will be awarded.

8.2 Expectation from students' the senior project

The senior project is one of core requirements for CE seniors' graduation from the B.S.C.E. program, which includes the two-semester CEGR 492-493 sequence. All senior students are expected to carefully read the content and ensure fully understanding of the demands of the CEGR 492-493 sequence.

8.2.1 Expectations from students' first senior-project meeting with advisors

The senior students working on their senior projects in the first meeting with their project advisor are expected to:

- Understand the course objectives, outcomes, grade distribution and guideline.
- Understand the requirements for the oral presentation and project report writing.
- Complete the schedule of weekly meeting times with their advisors.
- Submit the forms (the project advisor form and the weekly progress report).
- Understand the project development rules and academic integrity statement.
- Understand the tight timeline for completing the project.

8.2.2 Expectations from seniors' work on senior projects each week

Assigned students are expected to meet with their project advisors at least once a week for close monitoring and high-end result attainment. Failure to attend meetings without reasonable excuse should be flagged using STARFISH. The signed weekly progress report from students is expected to be completed.

8.2.3 Expectations from graduating seniors

- Completion and submission of the ABET Project Analysis by March 30th for graduating seniors in May).
- Assessment of student performance by the mid-semester. Students who do not meet the minimum requirement of having a completed literature review and some project tasks, under project implementation, should receive a poor grade in the mid-term (At the discretion of each advisor). This would deter negligence and a poor attitude towards the senior project.
- Final project report submission (e.g., on April 25th for graduating senior in May).

In general, students are expected to be self-driven and should be given technical advisement and support as deemed necessary. Only students who have had their proposal rationale approved and have completed their proposals in the fall semester should be further advised for their senior projects. CE's graduating senior students who have any questions regarding their senior projects, please feel free to contact Dr. Steve Efe, the Graduating Seniors Project Coordinator in the Department of Civil and Environmental Engineering.

9. BACHELOR OF SCIENCES TO MASTER OF ENGINEERING (A 4+1 YR B.S./M.ENG PROGRAM)

The Department of Civil and Environmental Engineering in School of Engineer at Morgan State University may offer a 4+1 YR program of Bachelor of Science/Master of Engineering (B.S./M. Eng). The detail information regarding the B.S./M. E. program can be found in the CE Graduate Program link:

https://www.morgan.edu/civil-engineering/ce-graduate-programs
https://catalog.morgan.edu/preview_program.php?catoid=24&poid=5537&returnto=1680

10. IMPORTANT UNIVERSITY POLICIES

10.1 University's Policy on Academic Integrity

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

10.1.1 Policy on Academic Dishonesty

Professors at Morgan State University make a concerted effort to promote honest academic conduct among students to make certain that their evaluation of student's

academic performance accurately reflects each student's true merit. Academic dishonesty is, therefore, among the most egregious offense a student can commit because it interferes with the university's primary mission of educating and evaluating students. Thus, academic dishonesty will not be tolerated at the university. Some of the more common forms of academic dishonesty are cheating, plagiarism, abuse of academic materials, stealing and lying. This list, however, is not intended to be an exhaustive representative of all the possible forms of academic dishonesty. Student conduct and performance will be recorded and tracked using Starfish, the student/faculty advising tool. Any student who is found to have engaged in academic dishonesty shall fail the assignment and may fail the course. The student may also be referred to the Dean of the College or School in which the student's major is located for additional disciplinary action by the university. All instances of academic dishonesty shall be subject to the full range of penalties at the university's disposal. Additional information can be found in the CE Academic Integrity webpage.

10.1.2 Academic Integrity Subcommittee

1. Academic Dishonesty Committee (ADC)

The responsibilities of the Academic Dishonesty Committee (ADC) are as follows:

- Record and verify receipt of Violation Reports reported by the instructor
- Report the violation to the department chair
- Provide the final sanctions to the department chair
- Review the functioning of the committee, including of Academic Integrity Procedures and Appeals, to determine if changes are needed

2. Academic Grievance Committee (AGC)

The responsibilities of the Academic Grievance Committee (AGC) are as follows:

- Record and verify receipt of 'Appeal Form' initiated by an alleged Civil Engineering student
- Report the appeal case to the department chair
- Review the appeal case and further investigate the case
- Initiate the hearing process for instructor and alleged student
- Provide the final decision to the department chair

10.1.3 Appeal (Grievance) Procedure

The Academic Integrity Committee has suggested a step of appeal procedure which would ensure the speedy settlement of the appeal process.

Four steps as outlined below:

The appeal student shall convey his or her appeal to the Academic Grievance Committee (AGC) Chair to deal with appeal. *All information provided by students has to be true, accurate and complete.* The Committee Chair will have to reply to the complaints within forty-eight hours of its presentation to him or her.

If the appeal student is not satisfied with the answer or does not receive the answer within 48 hours, he or she shall, then, present the appeal using the google form (Appeal Form by Alleged Student).

The Chair set up the meeting of Academic Grievance Committee with notice to appeal student, the students can attend to the Committee meeting for the settlement of his or her appeal. The Committee has to give its recommendations in seven days and report the same to the Department Chair.

If still student is not satisfied either with the decision made by the Committee or does not receive decision from the committee, he or she can make appeal to the Department Chair for revision of the decision taken. The Department Chair can take a week period for appeal to be considered and the revised decision to inform to the appeal student.

10.2 University Policy on Student Conduct

Code of student conduct as approved by the Board of Regents on August 11, 2020 can be found at:

https://www.morgan.edu/studentconduct (click on "View Code of Student")

APPENDIX A: CIVIL ENGINEERING COURSE DESCRIPTIONS

ORIE 104 FRESHMAN ORIENTATION FOR ENGINEERING MAJORS - *Two hours lecture; 1 credit.* This course is designed to prepare students for the rigors of earning an engineering degree. It introduces students to the expectations and demands of higher education, to the legacy and traditions of Morgan State University, to college success strategies, and to the broad array of career opportunities in the fields of engineering. Students enrolled in this class are required to attend selected University convocations, School of Engineering programs, and other prescribed activities. They are also required to hold conferences with their faculty advisors. Students transferring 24 or more credits to the University when admitted are exempt from this requirement. (Formerly ORIE104). (FALL/SPRING)

ENGR 101 FUNDAMENTALS OF ENGINEERING I - *Four hours lecture, one hour laboratory; 4 credits.* This is the first part of a two course sequence designed to provide students with the analytical and problem solving skills needed as a foundation to enter into Calculus I (MATH 241), Introduction to Probability (MATH 120), and/or Finite Mathematics (MATH 118). Math concepts at the pre-calculus level (MATH 141) are accompanied by a contemporary engineering problem lab. MATH 141 is considered to be the equivalent to the two semester sequence of MATH113 and MATH 114. Prerequisite: MATH 113 or higher placement score or special permission from the program chair.

ENGR 102 FUNDAMENTALS OF ENGINEERING II - *Four hours lecture, one hour laboratory; 4 credits.* This is the second part of a two course sequence designed to provide students with more time to develop the analytical and problem solving skills needed as a foundation to enter into Calculus I (MATH 241), Introduction to Probability (MATH 120), and/or Finite Mathematics (MATH 118). Math concepts at the pre- calculus level (MATH114) are accompanied by engineering problem solving labs. Prerequisite: ENGR 101.

CEGR 106 INTRODUCTION TO CIVIL AND ENVIRONMENTAL ENGINEERING- *Two hours lecture; 1 credit.* This orientation course will introduce students to the concept of engineering design by exposure to several design problems from various areas of civil engineering including: structural, transportation, geotechnical and environmental engineering. (Formerly CEGR 105). Prerequisite: OREN 104. (FALL and SPRING)

CEGR 107 COMPUTERAIDED ENGINEERING GRAPHICS, ANALYSIS & DESIGN - *Two hours lecture, two hours studios; 3 credits.* This course introduces students to computer-aided engineering graphics and engineering analysis in the context of defining demonstrating and solving interesting but simple visualization and design problems in civil engineering; Review of geometry and trigonometry in conjunction with related computer graphics functions; data reduction and analysis, graphing and presentation. Introduction to Computer-Aided Drafting and Design (CADD) and to contemporary CAD/3D modeling and analysis software for civil engineers. Modeling exercises and design projects, with students working in teams

and using computer analysis and design spreadsheets and technical word processing and presentation programs. (Formerly CEGR 201). Prerequisite: None. (FALL/SPRING)

CEGR 110 SURVEY TECHNOLOGIES IN CIVIL ENGINEERING - *One hour lecture, three hours practicum, 2 credits.* The course provides students with comprehensive knowledge and understanding of surveying technologies and their applications in Civil Engineering. It will highlight fundamental surveying measurements, traverse computations, coordinate geometry, mapping, GPS and GIS, circular and parabolic curves, earthwork, boundary surveys, CAD applications. Students will actively participate in data acquisition, mapping, surveying, site geometries, and geology. Prerequisite: None

CEGR 202 STATICS - *Two hours lecture, two hours practicum; 3 credits.* Review of relevant concepts from geometry, algebra and calculus. Representation and resolution of vectors. Resultants of force and couple systems by graphical and analytical approaches. Particle interaction forces; Coulomb friction, spring behavior. Application of Free Body Diagrams in problem solving. Equilibrium of particles and rigid bodies. Analysis of simple trusses and frames. Center of gravity, center of mass, and centroid of area. Reduction of distributed normal loads, internal reactions, area moments of inertia Practicum: Problem solving in statics; forces and force components, moments and equilibrium, introduction to computer-aided design and simulations of simple structural systems. Project(s) would require oral and visual presentation and written report. Prerequisites: PHYS 205 and PHYS 205L. Co-requisite: MATH 242. (FALL/SPRING)

CEGR 212 MECHANICS OF MATERIALS AND LABORATORY - *Two hours lecture, three hours laboratory; 3 credits.* Stress and strain for various types of loads - axial, shear, torsion and bending. Constitutive Laws. Multidimensional Hooke's Law. Stress concentration. Introduction to Indeterminate analysis - Equilibrium vs. Compatibility. Combined stresses in 2D and 3D using Mohr's Circle. Laboratory exercises to include tension, compression, bending and torsion. Concrete mix design and asphalt mix design. Elastic vs. plastic behavior of metals. Use of basic finite element software to investigate concepts of stress and deformation caused by external loads. (Formerly CEGR 301). Prerequisite: CEGR 202. (FALL/SPRING)

CEGR 214 FLUID MECHANICS AND LABORATORY - *Two hours lecture, three hours laboratory; 3 credits.* The lecture includes the following: studies of fluid properties; fluid statics and dynamics involving integral and differential forms of fluid behavior; viscous flow in pipes; losses in bends, fittings, valves, and flanges; and similitude and dimensional analysis. The laboratory includes properties of fluids; viscosity of fluids; vortex apparatus; stability of floating bodies; flow measurements; losses in straight runs of pipes; and losses in bends fittings, valves, and flanges (Formerly CEGR 311) Prerequisite: MATH 243 and CEGR 106. Co-requisite: CEGR 110 and MATH 340. (FALL/SPRING)

CEGR 302 DYNAMICS - *Three hours lecture; 3 credits.* Kinematics and kinetics of particles and rigid bodies in one- and two-dimensional motion. Frictional behavior,

Mass moments of inertia. Motion of particle systems and simple deformable mass systems. Use of impulse and momentum methods. Application of principles of work, energy and power. Simple 3D gyroscopic motion. Introduction to free and forced vibrations of particles and simple rigid bodies. Coursework includes problems involving computer simulations. Prerequisite: CEGR 212. (FALL/SPRING)

CEGR 304 ENGINEERING MECHANICS - *Four hours lecture;* 4 *credits.* Resolution, composition" and equilibrium of forces. Analysis of force systems; center of gravity; and moments of inertia. Motion study; Newtons Laws and work-energy, impulse- momentum, and power. Closed to Civil Engineering Majors. Prerequisites: MATH 242 (Calculus II) and PHYS 205 (General Physics I). (FALL/SPRING).

CEGR 307 COMPUTER METHODS AND PROGRAMMING FOR CIVIL ENGINEERING – *One hour lecture, three hours practicum; 2 credits.* This course will introduce and reinforce computer methods and programming in Civil Engineering Analysis and Design. Overview of basic linear algebra, relevant numerical analysis algorithms, basic algorithm development and programming; types of variables, objects and classes, conversion of mathematical equations to objects and classes, and generation of corresponding software. Application of Spreadsheet and Computational-Math software to routine analysis and design; development of e-books in writing technical reports. Further exposure to general purpose CAD, Modeling and Analysis software. Examples will draw from diverse sub disciplines within Civil Engineering. Prerequisite: CEGR 107, MATH 243 and MATH 340. Co-requisite: PHYS 206, PHYS 206L. (FALL/SPRING)

CEGR 324 STRUCTURAL ANALYSIS I AND LABORATORY -*Two hours lecture, three hours laboratory; 3 credits.* Structural forms; structural load definitions; statically determinate structures; reactions; axial force, shear, bending moment and qualitative deflected shape diagrams for determinate beams and frames; cable-supported structures; arches; influence lines; Computer programming assignments are incorporated into the coursework. (Formerly CEGR 314). Prerequisites: CEGR 212. (FALL/SPRING)

CEGR 325 GEOTECHNICAL ENGINEERING AND LABORATORY - *Two hours lecture, three hours laboratory; 3 credits.* Basic physical and mechanical structural characteristics of geotechnical engineering applied to soil classification, permeability and seepage, in- situ stresses and compressibility, lateral earth pressures, slope stability, and bearing capacity of shallow foundations. (Formerly CEGR 334). Prerequisites: CEGR 212. (FALL/SPRING)

CEGR 332 HYDRAULIC ENGINEERING - *Three hours lecture; 3 credits.* Includes hydrology; open- channel flow; pipe flow; groundwater flow; dams and reservoirs. Computer programming assignments are incorporated into the course work. Prerequisite: CEGR 214. (FALL/SPRING)

CEGR 338 ENVIRONMENTAL ENGINEERING I AND LABORATORY - *Two hours lecture, three hours laboratory; 3 credits.* The lecture introduces students to the planning and design of elements of water treatment plants and elements of wastewater

treatment plants, and the design of sewers and water distribution system hydraulics. The laboratory applies the knowledge of general chemistry to sanitary chemical analyses, which include the various forms of solids, pH measurements, and salinity. The laboratory will also introduce the students to the use of the atomic absorption spectrophotometer. (Formerly CEGR 328). Prerequisites: CHEM 110, CHEM 110L, BIOL 101, and CEGR 214. (FALL/SPRING). Equivalent to SUEE 338

CEGR 400 PROJECT MANAGEMENT, FINANCE & ENTREPRENEURSHIP - *Two hours lecture; 2 credits.* The principles and techniques of project management in the planning, design and operation of civil engineering infrastructure and service systems. Specific topics and project management techniques covered include: Project manager and Team building and leadership, Economic analysis in project selection, Project Financing and entrepreneurship, project planning, project organization Project cost estimation, Network analysis and related applications to Project scheduling (i.e. PERT- CPM), Project Monitoring and control using Microsoft project software and project termination process. Prerequisites: ECON 211/ECON 212 and MATH 331/IEGR 251. (FALL/SPRING)

CEGR 416 TRANSPORTATION ENGINEERING - *Three hours lecture; 3 credits.* Engineering and planning for transportation facilities with emphasis on ground transportation. Topics include: vehicle motion, vehicle flow models, human factors, geometric de- sign, safety, capacity analysis and transportation planning. Prerequisite: ECON 211/212. Co-requisite: CEGR 325. (FALL/SPRING)

CEGR 436 ELEMENTARY STRUCTURAL DESIGN - *Three hours lecture; 3 credits.* Introduction to design principles. Safety factors. Steel and concrete properties. Design of steel and reinforced concrete beams and columns. Design of steel connections. Design of steel trusses. Prerequisite: CEGR 324. (FALL/SPRING)

CEGR 450 STRUCTURAL ANALYSIS II - *Three hours lecture; 3 credits.* Deflection of statically determinate structures using virtual work and moment area methods; analysis of statically indeterminate structures; approximate methods, stiffness and flexibility matrices, solution by digital computer. Plastic method of analysis. Prerequisite: CEGR 324. (FALL/SPRING)

CEGR 451 DESIGN OF REINFORCED CONCRETE STRUCTURES - *Three hours lecture 3 credits.* Structural properties of concrete, building codes; design of beams, columns, slabs, footings, and retaining walls. Prerequisites: CEGR 436. (FALL)

CEGR 452 DESIGN OF STEEL STRUCTURES - *Three hours lecture; 3 credits.* Introduction to steel structures; design of tension members, beams and column connections, plate girders, continuous beams; introduction to computer-aided design. Prerequisites: CEGR 436. (SPRING)

CEGR 453 RELIABILITY BASED DESIGN IN CIVIL ENGINEERING - *Three hours lecture; 3 credits.* Systems reliability and reliability analysis. Includes measures of reliability, reliability index, reliability bounds and other related

measurements. Prerequisite: MATH 331/IEGR 251. (OFFERED AS NEEDED)

CEGR 454 FOUNDATION ENGINEERING - *Three hours lecture; 3 credits.* Application of the principles of soil mechanics to the design of footings, retaining walls, pile foundations, bulkheads, cofferdams, bridge piers and abutments, and underpinnings. Prerequisite: CEGR 325. (FALL)

CEGR 455 SEEPAGE, DRAINAGE, AND GROUNDWATER - *Three hours lecture; 3 credits.* Introduction to groundwater hydrology, well hydraulics, permeability, seepage, flow nets, filter criteria, dewatering, slope stabilization, practical applications. Prerequisite: CEGR 325. (OFFERED AS NEEDED)

CEGR 456 EARTH STRUCTURES AND SLOPES - *Three hours lecture; 3 credits.* Earth dams, embankments and natural slopes. Site investigation, soil properties and compaction. Slope stability analysis and landslide prevention. Earthquake effects. Case studies. Prerequisite: CEGR 325. (OFFERED AS NEEDED)

CEGR 457 GEOTECHNICAL ENGINEERING - *Three hours lecture, 3 credits.* Geologic overview, site investigations, subsurface stresses and stress path analyses, shear strength and laboratory test, stress-strain relations, application of soil mechanics theories and site improvement, and slope stability analysis. Prerequisite: CEGR 325. (SPRING)

CEGR 458 BIOLOGICAL WASTE WATER TREATMENT - *Three hours lecture; 3 credits.* This course covers the planning and design of the unit operations and unit processes of biological wastewater treatment. Topics include principles of biological treatment; biological lagoons; trickling filter; activated sludge process; anaerobic and aerobic digestion of sludge. Prerequisite: CEGR 332 and CEGR 338/SUEE 338 (OFFERED AS NEEDED). Equivalent to SUEE 458.

CEGR 459 WATER SUPPLY ENGINEERING - *Three hours lecture; 3 credits.* This course covers planning and design in water supply engineering which includes raw water supply sources, reservoir sizing, pumping and transmission of raw and treated waters, groundwater, distribution systems, treatment processes and chemistry and microbiology of raw and treated waters. Prerequisite: CEGR 332 and CEGR 338/SUEE 338. (FALL). Equivalent to SUEE 459.

CEGR 460 HAZARDOUS WASTE MANAGEMENT- *Three hours lecture; 3 credits.* This course is an in-depth study of hazardous waste management covering the scientific and engineering principles of hazardous waste management. Specific topics covered include properties, behavior (pathways, fates and disposition) of hazardous materials in air, groundwater and soil, exposure assessment, regulations, treatment and remediation technologies of hazardous waste materials. Prerequisites: CEGR 332 and CEGR 338 or SUEE 338. (OFFERED AS NEEDED). Equivalent to SUEE 460.

CEGR 463 PHYSICAL – CHEMICAL TREATMENT OF WASTEWATER - *Three hours lecture; 3 credits.* Theory and application of physical and chemical operation

and processes for wastewater treatment. Topics and discussion will include sedimentation; flotation; disinfection; coagulation; flocculation; filtration; carbon absorption; reverse osmosis; ion exchange and thickening. Prerequisite: CEGR 332 and CEGR 338 or SUEE 338. (SPRING). Equivalent to SUEE 463

CEGR 464 ENVIRONMENTAL ENGINEERING II - *Three hours lecture; 3 credits.* This course covers planning and design in environmental engineering which include environmental engineering hydrology, hydraulics and pneumatics; air pollution control; and solid waste characteristics, management and control. Prerequisite: CEGR 332 and CEGR 338/SUEE 338. (FALL). Equivalent to SUEE 464

CEGR 465 TRAFFIC ENGINEERING - *Three hours lecture; 3 credits.* The principles of traffic engineering involving the analysis, planning and design of roads, streets and highways, and their related networks. Coverage includes the dynamics of traffic flows; traffic studies and data collection; capacity analysis of freeways and arterials; the analysis and design of traffic control systems, including signalized and unsignalized intersections. Prerequisite: CEGR 416. (FALL)

CEGR 466 TRANSPORTATION MODELS AND SIMULATION - *Three hours lecture; 3 credits.* The theory, development and application of models and modeling systems commonly used in the planning, design and operational analysis of transportation systems. Students are expected to apply existing software in the analysis of transportation data sets and to develop models using one of the common high level languages. Applications will include: travel demand estimation, modal choice, terminal and servicing phenomena and traffic performance evaluation. Prerequisites: CEGR 416. (SPRING)

CEGR 467 TRANSPORTATION INFRASTRUCTURE ENGINEERING SYSTEMS- *Three hours lecture; 3 credits.* Advanced topics In the transportation infrastructure engineering systems and management. Topics and methods to include: constrained optimization; marginal analysis; linear programming; sensitivity analysis; dynamic programming; multi-objective optimization. Prerequisite: CEGR 416. (OFFERED AS NEEDED)

CEGR 470 ENERGY EFFICIENCY IN BUILDINGS - *Three hours lecture; 3 credits.* Introduction to principles of energy generation, transport and storage in building components, materials and spaces. Concepts of thermal comfort and energy conservation in buildings. Heating, cooling and air change/quality requirements. Thermal analysis and design of building envelopes. Performance and control of HVAC and other integrated building energy components. Introduction to solar - renewal energy and sustainable building design, analysis and performance assessment. Prerequisite: PHYS 206, PHYS 206L and CEGR 400. (OFFERED AS NEEDED)

CEGR 471 MECHANICAL AND ELECTRICAL FACILITIES - *Three hours lecture; 3 credits.* Introduction to principles and applications of mechanical and electrical systems to the design, construction codes, and integration of (1) mechanical facilities, including water and waste plumbing, heating, ventilating, air-conditioning, and fire-

protection, and (2) electrical facilities, including power, lighting and safety circuits and wiring, and building automation systems. Prerequisite: PHYS 206, PHYS 206L and CEGR 400. (OFFERED AS NEEDED)

CEGR 475 FUNDAMENTALS OF CONSTRUCTION ENGINEERING AND MANAGEMENT - *Three hours lecture; 3 credits.* This course will teach the applications of the fundamentals of construction engineering and management in construction practice and provide a foundation in the important aspects of construction management and the emerging areas that will concern the construction manager in the future. Prerequisite: CEGR 307 and CEGR 400. (FALL/SPRING)

CEGR 476 CONSTRUCTION ECONOMICS - *Three hours lecture; 3 credits.* This course will teach the civil engineering, architecture, surveying, mechanical engineering, structural engineering, construction, project or estate management, property development, conservation and economics student, the basic concepts of allocation of scarce resources in construction. Prerequisite: CEGR 307 and CEGR 400. (FALL)

CEGR 477 FUNDAMENTALS OF CONSTRUCTION ESTIMATING - *Three hours lecture; 3credits.* This course will teach the students the process of construction cost estimating and control of construction projects. It will provide learning in cost estimating that is applicable to students taking the course while in college or while they are out of college, but have recently assumed estimating responsibilities in a construction organization. Prerequisite: CEGR 307 and CEGR 400. (SPRING)

CEGR 480 FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEMS - *Three hours lecture;* 3 *credits.* The course provides students with comprehensive knowledge and understanding of Geographic Information Systems (GIS) and its applications in science, technology, engineering and mathematics (STEM). It will cover GIS concepts, principles, and applications. Data acquisition, processing, management, analysis, modeling, and product generation are emphasized. Students will actively participate in data acquisition, and mapping. Training in GIS software, including ArcGIS/Arc View, GeoMedia Suite, and Pathfinder Office software will be provided during the course. Term project with oral presentation and written report will form part of this course. Prerequisite: CEGR 110 and CEGR 307. (SPRING)

CEGR 481 FUNDAMENTALS OF REMOTE SENSING - *Three hours lecture; 3 credits.* The course introduces students to sensor systems, basic concepts of Remote Sensing (RS), methodologies and applications in science. Technology, engineering and mathematics (STEM). Aerial photographs and airborne/satellite images will be processed and analyzed. NASA's Mission to Planet Earth and the Earth Observing Systems (EOS) Program will be introduced. Training in RS software, including the environment for visualizing images (ENVI) will be provided. Students will actively participate in data acquisition, ground- truthing/verification, and final product generation/mapping. Term project with oral presentation and written report will form part of this course. Prerequisite: CEGR 110 and CEGR 307. (FALL)

CEGR 492 SENIOR REVIEW AND PROJECT PROPOSAL - *One hour lecture, four hours practicum; 2 credits.* This course, typically undertaken in student's penultimate semester, has two parts: (1) Lecture (Senior Project Proposal) - during which student develops, in concert with a faculty advisor (for some projects, it is also desirable that the student select an advisor from industry, in addition to the faculty advisor), the technical proposal for the Senior Design Project, and (2) Practicum - comprehensive review of the Fundamentals of Engineering (FE) civil-discipline-specific examination topics and mock-FE examinations. A brief initial part of the practicum reviews technical report writing and presentation for engineers and development of a design project proposal. Two 4-hour mock-FE exams (simulating the A.M. and P.M. sessions of the FE exam) serve as the program's Comprehensive examination, as well as an assessment of the practicum part of the course. The final grade in the course is a combination of the faculty advisor's evaluation of the student's project proposal effort and written report, and the student' performance in the mock-FE exams and other aspects of the practicum. Civil Engineering students of at least junior standing may be allowed, with department approval, to audit the review class portion without financial obligation. Prerequisite: CEGR 416, CEGR 338, CEGR 332 and CEGR 325. Co-requisite: CEGR 307 and CEGR 436. (SPRING and FALL)

CEGR 493 SENIOR PROJECT - *Two hours lecture; 1 credit.* This is a follow up on the proposal developed and approved in CEGR 492 and will focus on the execution of the proposed analysis and design, under the guidance of the same faculty advisor (and external advisor, if any). Specific guidelines on the successful completion of the project should come from the student's faculty advisor. However, this second semester of the two-semester CEGR 492-493 sequence should be spent on finalizing preliminary design and analysis, as well as completion of detailed design and possible optimization, creation of a design project report of acceptable format, conclusion of student's electronic portfolio, and a formal delivery of a PowerPoint (or similar) presentation of the project to an audience of faculty, students and others. The grade for this course is based upon two components: (1) the advisor's assessment of the student's progress through the entire design project and the quality of the written technical report and (2) department's assessment of the student's up-to-date electronic portfolio; and assessment, by the attending department faculty, of the content and the quality of the presentation made by the student. Prerequisite: CEGR 492. (FALL and SPRING)

CEGR 496 SENIOR PROJECT PROPOSAL AND DESIGN - *Two hours lecture, four hours practicum; 3 credits.* This is a one-semester course combining CEGR 492 Senior Review and Project Proposal, and CEGR 493 Senior Project. Prerequisite: CEGR 416, CEGR 338, CEGR 332 and CEGR 325. Co-requisite: CEGR 307 and CEGR 436. (OFFERED AS NEEDED)

Note: CEGR 496 is only applicable to a student in the MSU-Purdue University 3+2 Dual BS Program and needs to be approved by the Department (on a case-by-case basis). It is not allowed a CE student to replace the CEGR 492 - CEGR 493 sequence with CEGR 496 for his/her Senior Project.

CEGR 498 TOPICS IN CIVIL ENGINEERING - *Three hours lecture: 3 credits.* In-depth study in areas of student/faculty interest. Approvals of the faculty advisor and Department Chair are required (FALL/SPRING).

APPENDIX B: FORMS

1. Change of Catalog Request Form. PURPOSE: To change the academic catalog you matriculated under.
   https://powerforms.docusign.net/e095a1d9-fbaa-4283-bb75-38cde823b37b?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

2. Change of Major/Minor Request Form. PURPOSE: To change or update major, minor, or concentration. Please note this form must route to multiple people for review and signature.
   https://powerforms.docusign.net/f41ec3cb-baef-4b0c-bae5-48aa5de76db7?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

3. Excess Credit Request Form. PURPOSE: Request to take more than the maximum allowable credits in a semester. Please note this form must route to multiple people for review and signature.
   https://powerforms.docusign.net/c2ca4650-84ce-4b40-94b4-b25775551e03?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

4. Personal Information Update Request Form. PURPOSE: To update legal name, date of birth, permanent address, and/or social security number.
   https://powerforms.docusign.net/bec4d09a-c7c0-4295-b91e-46e972f39ad6?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

5. Time Conflict Request Form. Please follow the submission deadline. PURPOSE: To request permission to register for a course that the scheduled time conflicts with another course the student is already registered for. Read online instructions. https://powerforms.docusign.net/98c3d11b-e9f8-4822-8f11-9e658eae9918?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

6. Withdrawal Request Form. Cancellation requests are only valid through the last day of add/drop. Read online instructions. PURPOSE: To cancel or withdraw from a semester or from the university entirely. Please note this form has to route to multiple offices for review and signature.

https://powerforms.docusign.net/3b6b101b-2aa4-40df-833f-8c448bf1cdbd?env=na2&acct=91e00bed-fb84-48ab-9c47-f3a2c0621225&accountId=91e00bed-fb84-48ab-9c47-f3a2c0621225

For more forms please go to: https://www.morgan.edu/registrar/forms

APPENDIX C: CIVIL AND ENVIRONMENTAL ENGINEERING FACULTY AND STAFF

Find more information here: https://www.morgan.edu/civil-engineering/faculty-and-staff

C1. Faculty and Staff Contact Information (Full Time)

NAME	TITLE	OFFICE	PHONE	EMAIL
NIKARA WILLIAMS	ADMINISTRATIVE ASSISTANT I	CBEIS 101	443-885-3098	NIKARA.WILLIAMS@MORGAN.EDU
EFE, STEVE	ASSISTANT PROFESSOR	CEBIS 333	443-885-3295	STEVE.EFE@MORGAN.EDU
GHEIBI, EMAD	LECTURER	CBEIS 210	443-885-4552	EMAD.GHEIBI@MORGAN.EDU
HUNTER, JAMES	ASSISTANT PROFESSOR	CBEIS 305	443-885-4733	JAMES.HUNTER@MORGAN.EDU
KANG, DONG HEE	ASSISTANT PROFESSOR	CEBIS 307	443-885-4728	DONGHEE.KANG@MORGAN.EDU
KIMANI, SAMUEL	INSTRUCTIONAL LABORATORY ASSOC.	CEBIS 303	443-885-4200	SAMUEL.KIMANI@MORGAN.EDU
LEE, HYE JEONG	INSTRUCTIONAL LABORATORY ASSOC.	CBEIS 309	443-885-5708	HYEJEONG.LEE@MORGAN.EDU
LI, JIANG	CHAIR, PROFESSOR	CEBIS 304	443-885-4202	JIANG.LI@MORGAN.EDU
LIU, YI	ASSISTANT PROFESSOR	CBEIS 208	443-885-3067	YI.LI@MORGAN.EDU
OGUNTIMEIN, GBEKELOLUWA	LECTURER	CEBIS 310	443-885-4223	GBEKE.OGUNTIMEIN@MORGAN.EDU
OWOLABI, OLUDARE	ASSOCIATE PROFESSOR	CEBIS 311	443-885-5445	OLUDARE.OWOLABI@MORGAN.EDU
SAMINANTHAN, KIRUTHIKA	LECTURER	CEBIS 205	443-885-3868	KIRUTHIKA.SAMINATHAN@MORGAN.EDU
SHENG, ZHUPING	PROFESSOR	CEBIS 313	443-885-2243	ZHUPING.SHENG@MORGAN.EDU
SHOKOUHIAN, MEHDI	ASSISTANT PROFESSOR	CEBIS 205	443-885-4873	MEHDI.SHOKOUHIAN@MORGAN.EDU
WRIGHT BROWN, CECELIA	LECTURER	CBEIS 204	443-885-2269	CECELIA.WRIGHTBROWN@MORGAN.EDU

C2. Faculty and Staff Contact Information (Part Time)

NAME	TITLE	OFFICE	PHONE	EMAIL

C3. Faculty Members and Research Interests

1. **Steve Efe**, Associate Professor, D.E., Morgan State University. Research interest: earthquake engineering, linear and non-linear finite element applications in structural engineering, failure analysis of steel and steel-concrete buildings and bridges, vibration control of structural systems, protection of structures, buildings, bridges, and other structures against hazards and attacks, materials behavior and constitutive modeling
2. **Emad Gheibi**, Lecturer, Ph.D., University of South Carolina, Research interests: Ground improvement, seismic geohazard assessment, liquefaction analysis of coastal areas, infrastructure resilience and sustainability, geohazard and landslide, geomechanics and composite materials, climate change and geo-environment.
3. **James Hunter** Jr., Associate Professor; Ph.D., Purdue University. Research Interest: Environmental e ngineering, e cological e ngineering, coastal and u rban g reen Infrastructure, and Watershed Systems Design.
4. **Dong Hee Kang**, Associate Professor; Ph.D. Purdue University. Research Interests: the potential stormwater impacts of urbanized; critical water bodies and urban infrastructure contribution to pollutant loading; treatment efficacy of nitrogen and phosphate; the dominant mechanism of fate and transport of emerging contaminants.
5. **Jiang Li**, Professor; Ph.D., University of Nevada-Reno. Research Interest: hydrogeology, aquifer mechanics, soil and rock mechanics, land movement due to ground fluids withdrawal.
6. **Yi Liu**, Associate Professor; D.E., Morgan State University. Research Interest: geotechnical engineering, geohydrology, aquifer mechanics, modeling of land subsidence and sea level rise.
7. **Gbekeloluwa Oguntimein**, Lecturer; Ph.D. Iowa University; M.S., University; B.S.E.E, University. Research Interests: environmental engineering, biochemical engineering, chemical engineering, and food process engineering.
8. **Oludare Owolabi**, Associate Professor; PhD., Georgetown University. Research Interests: pavement engineering, soil mechanics, physical and numerical modeling of soil structures, computational geo-mechanics, geo-structural systems analysis, structural mechanics, sustainable infrastructure, and material development.
9. **Kiruthia Saminanthan**, Lecturer, GIS, Survey and Geospatial analysis.
10. **Zhuping Sheng**, Professor, Ph.D., University of Nevada-Reno, Research Interest: hydrogeology, aquifer mechanics, soil and rock mechanics, geohazards, landslides, land subsidence and earth fissures, water resources planning and management, managed aquifer recharge.
11. **Mehdi Shokouhian**, Associate Professor, Ph.D., Tsinghua University. Research interest: design and stability of structures made of high-performance materials using theoretical, numerical and experimental methods, structural bracing systems for high rise buildings to achieve higher ductility and energy-dissipating capacity of steel structures in severe earthquakes.
12. **Cecelia Wright Brown**, Lecturer, D.E., Morgan State University, Research Interest: construction engineering, project management, construction management and policies.