

2014-2015 LONG SIGNATURE SHEET



*Done
K. Gove
11/25/14*

Proposal Number: CEGR 10-09-14

UNC CHARLOTTE

Proposal Title: Establish a Civil Engineering Concentration in Structures, Environmental, Transportation, Geotechnical and Land Development
 Originating Department: Civil and Environmental Engineering

TYPE OF PROPOSAL: UNDERGRADUATE GRADUATE UNDERGRADUATE & GRADUATE
 (Separate proposals sent to UCCC and Grad. Council)

DATE RECEIVED	DATE CONSIDERED	DATE FORWARDED	ACTION	SIGNATURES
			Approved	<u>DEPARTMENT CHAIR</u> <i>John Daniels</i> John Daniels
	10/29/14		Approved	<u>COLLEGE CURRICULUM COMMITTEE CHAIR</u> Mehdi S. Miri <i>Mehdi S. Miri</i>
			Approved	<u>COLLEGE FACULTY CHAIR (if applicable)</u> [print name here:]
7/29/14	10/29/14		Approved	<u>COLLEGE DEAN</u> <i>Robert E. Johnson</i> Robert E. Johnson
			Approved	<u>GENERAL EDUCATION</u> (if applicable; for General Education courses) [print name here:]
			Approved	<u>HONORS COLLEGE</u> (if applicable; for Honors courses & programs) [print name here:]
	4/13/15		Approved	<u>UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR (for undergraduate content)</u> <i>Kim Harris</i>
			Approved	<u>GRADUATE COUNCIL CHAIR</u> (for graduate content)
4/14/2015				<u>FACULTY GOVERNANCE ASSISTANT</u> (Faculty Council approval on Consent Calendar) <i>M. D. Gove</i>
				<u>FACULTY EXECUTIVE COMMITTEE</u> (if decision is appealed)

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UNC CHARLOTTE

LONG FORM COURSE AND CURRICULUM PROPOSAL

*To: Undergraduate Course and Curriculum Committee Chair

From: Civil and Environmental Engineering

Date: October 10, 2014

Re: Establish a Civil Engineering Concentration in Structures, Environmental, Transportation, Geotechnical and Land Development

The Long Form is used for major curriculum changes. Examples of major changes can include:

Undergraduate: Major changes include new undergraduate degrees, minors, concentrations, certificates, and changes to more than 50% of an existing program (Note: changing the name of an academic department does not automatically change the name(s) of the degree(s). The requests must be approved separately by the Board of Governors.)

Graduate: Major changes include new graduate courses, major changes to an existing graduate course or major changes to an existing graduate program

Submission of this Long Form indicates review and assessment of the proposed curriculum changes at the department and collegiate level either separately or as part of ongoing assessment efforts.

*Proposals for undergraduate courses and programs should be sent to the. Proposals related to both undergraduate and graduate courses, (e.g., courses co-listed at both levels) must be sent to both the Undergraduate Course and Curriculum Committee and the Graduate Council.

I. HEADING AND PROPOSAL NUMBER

CEE 10-10-14

University of North Carolina at Charlotte

New Undergraduate Proposal

Course and Curriculum Proposal from: Civil & Environmental Engineering (CEE)

Title: Establishment of Concentrations in Civil and Environmental Engineering: Environmental, Geotechnical, Structural, Transportation, and Land Development.

II. CONTENT OF PROPOSALS

Summary: The Civil and Environmental Department (CEE) Department proposes to establish Concentrations in the focus areas of Environmental Engineering (Env), Geotechnical Engineering (Geo), Structural Engineering (Struc), and Transportation Engineering (Trans), and Land Development (LDev). The CEE Department also proposes to add eight new CEGR electives to support these concentrations.

Justification: CEE recently (2013) established an Energy Concentration in Civil Engineering in response to industry requests and analysis of the marketplace for current and future graduates of the Civil & Environmental Engineering program (BSCE). Additionally, students have requested similar CEE Concentrations in the four focus areas (Env, Geo, Struc, Trans) and additionally in LDev. CEE faculty members believe the establishment of these Concentrations will help potential employers more easily identify our graduate's areas of strength, improving their career opportunities. Discussions with members of the department's advisory board and other employers of CEE graduates from UNC Charlotte supported this belief.

The proposed Struc, and Trans Concentrations will use current courses in the CEE program. The proposed Env Concentration will use current courses in the CEE program plus three new requested courses, CEGR 4147 Stormwater Management, CEGR 4247 Sustainability, and CEGR 4148 Open Channel Hydraulics. The proposed Geo Concentration will use current courses in the CEE program plus two new requested courses, CEGR 4273 Ground Improvement and CEGR 4276 Natural Hazards. The proposed LDev Concentration will use three new requested courses, CEGR 3231 Land Development Engineering Fundamentals, CEGR 3232 Land Development Engineering - Advanced Site Analysis, and CEGR 3233 Land Development Engineering Studio. All but one of the proposed courses have been taught many times as a CEGR 3090 or a CEGR 4090 course and well attended. CEGR 4148 Open Channel Hydraulics is a proposed new course and has been taught as part of an existing course (CEGR 4146 Advanced Engineering Hydraulics). The Environmental Group wishes to separate the content of the existing course (CEGR 4146 Advanced Engineering Hydraulics) into two separate courses, allowing the difference to be distinguished on students' transcripts. Other than the proposed new courses,

existing courses will not require changes to prerequisites and co-requisites. Students can obtain any one of the five Concentrations within the required 128 hour BSCE curriculum. The addition of the proposed five concentrations and courses will not change requirements for admission or GPA.

Establishment of the Concentrations will provide graduates with tangible evidence (on transcript) of depth of study in the particular focus area. Currently, graduates can only make their case that they have established depth in a focus area in Civil Engineering through inclusion in a cover letter or during job interviews. Having the designation on the official transcript helps graduates establish this fact.

Impact: Most undergraduate Civil Engineering students choose to concentrate their studies within one of our core areas or land development. Focusing their elective classes in the Env, Geo, Struc, Trans, or LDev area and having that Concentration noted on their transcript will allow the transcript to highlight that concentration in job interviews. Based on the response from CEE students, most students graduating with a CEE Degree will choose a Concentration.

All but one of the courses required for each Concentration are currently taught once a year as a long established CEGR 3090 course, or CEGR 4090 course and well attended; therefore, no adverse enrollment impact is expected. The one proposed new course (CEGR 4148 Open Channel Hydraulics) and the existing CEGR 4146 Advanced Engineering Hydraulics course could compete for students within the same core area. Therefore, the proposed CEGR 4148 Open Channel Hydraulics is expected to be taught once every three semesters and in alternate semesters to the existing course (CEGR 4146 Advanced Engineering Hydraulics) to mitigate any enrollment impact. All of these classes are elective classes and typically have 15 to 30 students.

There are five three-hour CEGR/Technical electives as part of our current curriculum outline. The students will fill these four CEGR/Technical elective requirements with courses to fulfill the selected Concentration requirements; therefore, there will be no change to the CEE's current curriculum outline. There are no changes to prerequisites in or out of Department and no requirement change for admission or GPA requirements.

III. RESOURCES REQUIRED TO SUPPORT PROPOSAL.

Resources: None. Choosing a Concentration will be simply a selection by the student. Courses currently taught as a CEGR 3090 or CEGR 4090 will require no additional resources or faculty. Dr. James Bowen has requested and will teach the new proposed course (CEGR 4148 Open Channel Hydraulics) and TAs are not usually assigned to senior level elective courses. Computer modeling is typically used in a senior level open channel hydraulics class; however, these computer programs are free or already purchased by the Department for use in other courses.

IV. CONSULTATION WITH THE LIBRARY AND OTHER DEPARTMENTS OR UNITS

A. LIBRARY CONSULTATION.



J. Murrey Atkins Library

Consultation on Library Holdings

To: Bill Saunders

From: Jeff McAdams

Date: 09/26/14

Subject: Establish a Civil Engineering Concentration in Structures, Environmental, Transportation, Geotechnical and Land Development

Summary of Librarian's Evaluation of Holdings:

Evaluator: Jeff McAdams

Date: 09/26/14

Check One:

- 1. Holdings are superior _____
- 2. Holdings are adequate x
- 3. Holdings are adequate only if Dept. purchases additional items. _____
- 4. Holdings are inadequate _____

Comments:

Library holdings should be adequate to support student research for this course (see list of items held by subject heading below). Students will have access to relevant databases including Compendex, ASCE Digital Library, Environmental Sciences and Pollution Management, CRC Engineering Handbooks, Geo Ref, GeoScienceWorld, Transportation Research Record, and many others.

LC Subject Heading	Books	Journals
Environmental Engineering	1372	88
Structural Engineering	1133	43
Geotechnical Engineering	92	4
Transportation Engineering	574	23
Land Development Engineering	463	1

Evaluator's Signature

9/26/14

Date

- B. CONSULTATION WITH OTHER DEPARTMENTS OR UNITS.** There was no consultation with other departments because all of the proposed changes are internal and don't affect any other department.

V. INITIATION, ATTACHMENTS AND CONSIDERATION OF THE PROPOSAL

- A.** The establishment of the Concentrations and the courses to support these concentrations has been discussed with students, at multiple faculty meetings, with members of the CEE department's advisory board and other employers of CEE graduates. As a result, the addition of the CEE Concentrations was strongly supported by everyone.

B. CREDIT HOUR. (Mandatory if new and/or revised course in proposal)

Review statement and check box once completed:

- The appropriate faculty committee has reviewed the course outline/syllabus and has determined that the assignments are sufficient to meet the University definition of a [credit hour](#).

Saunders, William

From: Gergely, Janos
Sent: Wednesday, October 08, 2014 2:36 PM
To: Saunders, William
Cc: Kane, Martin; Pando, Miguel; Amburgey, James
Subject: course proposals

Dr. Saunders:

The Civil and Environmental Engineering Curriculum Committee has reviewed on October 8th, 2014 the course outlines and syllabus for the seven proposed courses, and has determined that the assignments are sufficient to meet The University definition of a credit hour.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Janos Gergely, Ph.D., S.E., P.E.
(Chair, CEE Curriculum Committee)
Associate Professor, Structures
ASCE Student Chapter Faculty Adviser
UNC Charlotte | Civil and Environmental Engineering
9201 University City Blvd. | Charlotte, NC 28223
Tel: 704-687-1221 | Fax: 704-687-0957
jgergely@uncc.edu

Proposed Concentrations:

Geotechnical Engineering Concentration in the Civil and Environmental Engineering Department

SUMMARY: The Department of Civil & Environmental Engineering requests to establish an Undergraduate Geotechnical Engineering Concentration to prepare students on the ways geo-materials are characterized and used for all infrastructure constructions.

PROPOSED CATALOG COPY: BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.) (CONCENTRATION IN GEOTECHNICAL ENGINEERING). The Geotechnical Engineering Concentration is intended for students to gain a solid foundation in civil engineering through a selection of core required courses supplemented with elective courses that increase their depth in the concentration and meet their professional aspirations. Traditionally, geotechnical engineering focuses on the design and construction of foundations, slopes, retaining walls, and earthen structures. However, today the scope of this discipline has dramatically expanded to include geo-environmental engineering, design and construction of tunnels, landfills, waste management facilities, site and amended geo-material characterization, design of pavements and geopavements, as well as natural hazards assessment and mitigation. Students completing the requirements described in this program will receive a special designation on their transcripts showing they have completed the geotechnical engineering concentration.

COURSE REQUIREMENTS:

Students opting for this concentration must complete a minimum of 15 credits as follows:

- a) Students must take all of the following courses (9 credits):
 - CEGR 4278: Geotechnical Engineering II
 - CEGR 4145: Groundwater Resources Engineering
 - CEGR 3225: Reinforced Concrete Design I

- b) Students must pick two of the following electives (6 credits):
 - CEGR 4264: Landfill Design and Site Remediation
 - CEGR 4270: Earth Pressure and Retaining Structures
 - CEGR 4271: Pavement Design
 - CEGR 4272: Design with Geosynthetics
 - CEGR 4273: Engineering Ground Improvement
 - CEGR 4276: Natural Hazards

Through careful course selection and scheduling, a student can obtain the Geotechnical Concentration within the required 128 hour BSCE curriculum. The student must earn at least a 2.5 GPA in the selected Concentration courses.

Land Development Engineering Concentration in the Civil and Environmental Engineering Department

SUMMARY: The Department of Civil & Environmental Engineering requests to establish an Undergraduate Civil Engineering Concentration in Land Development Engineering to prepare engineers for careers in an interdisciplinary field that requires Engineers to be aware of the economic, environmental and social demands of communities and neighborhoods with respect to land development.

PROPOSED CATALOG COPY: BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.) (CONCENTRATION IN LAND DEVELOPMENT ENGINEERING). The Land Development Engineering Concentration is intended for students interested in a specialized focus in land development engineering as it relates to civil engineering and infrastructure issues. Students completing the requirements described in this program will receive a special designation on their transcripts showing they have completed the land development engineering concentration.

COURSE REQUIREMENTS:

Students must take these two courses:

- CEGR 3231: Land Development Engineering Fundamentals
- CEGR 4185: Geometric Design of Highways

Students must pick two of the following:

- CEGR 3232: Land Development Engineering – Advanced Site Analysis
- CEGR 3233: Land Development Engineering Studio
- CEGR 4247: Sustainability
- CEGR 4147: Stormwater Management

Through careful course selection and scheduling, a student can obtain the Land Development Concentration within the required 128 hour BSCE curriculum. The student must earn at least a 2.5 GPA in the selected Concentration courses.

Structures Concentration in the Civil and Environmental Engineering Department

SUMMARY: The Department of Civil & Environmental Engineering requests to establish an Undergraduate Civil Engineering Concentration in Structures to prepare engineers to analyze and design buildings, other structures, and non-structural elements.

PROPOSED CATALOG COPY: BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.) (CONCENTRATION IN STRUCTURES). The Structures Concentration is intended for students interested in a focus in structures as it relates to civil engineering and infrastructure issues. Specialized courses will prepare students to apply fundamental mechanics principles to analysis and employ iterative design processes. The latest building code requirements, as well as analysis and design software packages, will be introduced. Students completing the requirements described in this program will receive a special designation on their transcripts showing they have completed the structures concentration.

COURSE REQUIREMENTS:

Students must take all of the following courses:

- MEGR 3121: Dynamic Systems I
- CEGR 3221: Structural Steel Design I
- CEGR 3225: Reinforced Concrete Design I
- CEGR 4126: Codes, Loads, and Nodes
- CEGR 4278: Geotechnical Engineering II

Students must pick two of the following electives:

- *CEGR 4222: Structural Steel Design II
- *CEGR 4224: Advanced Structural Analysis
- *CEGR 4226: Reinforced Concrete Design II
- CEGR 4108: Finite Element Analysis and Applications
- CEGR 4223: Timber Design
- CEGR 4123: Bridge Design

(* At least one of the two elective courses must be CEGR4222, CEGR4224, or CEGR4226)

Through careful course selection and scheduling, a student can obtain the Structures Concentration within the required 128 hour BSCE curriculum. The student must earn at least a 2.5 GPA in the selected Concentration courses.

Transportation Concentration in the Civil and Environmental Engineering Department

SUMMARY: The Department of Civil & Environmental Engineering requests to establish an Undergraduate Civil Engineering Concentration in Transportation to prepare engineers to plan, design, analyze, and manage transportation facilities.

PROPOSED CATALOG COPY: BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.) (CONCENTRATION IN TRANSPORTATION). The Transportation Concentration is intended for students interested in a focus in transportation as it relates to civil engineering and infrastructure issues. Specialized courses will prepare students to apply fundamental and scientific principles to plan, design, analyze, and manage transportation facilities. The latest manuals and design guides, as well as analysis and design software packages, will be introduced. Students completing the requirements described in this program will receive a special designation on their transcripts showing they have completed the transportation concentration.

COURSE REQUIREMENTS:

Students must take all of the following courses:

- CEGR 4162: Transportation Planning
- CEGR 4185: Geometric Design of Highways
- CEGR 4262: Traffic Engineering

Students must pick one of the following electives:

- CEGR 4161: Advanced Traffic Engineering
- CEGR 4171: Urban Public Transportation
- CEGR 4181: Human Factors
- CEGR 4271: Pavement Design

Through careful course selection and scheduling, a student can obtain the Transportation Concentration within the required 128 hour BSCE curriculum. The student must earn at least a 2.5 GPA in the selected Concentration courses.

Environmental/Water Resources Engineering Concentration in the Civil and Environmental Engineering Department

SUMMARY: The Department of Civil & Environmental Engineering requests to establish an Undergraduate Civil Engineering Concentration in Environmental Engineering to prepare engineers to analyze and design environmental and water resource engineering systems.

PROPOSED CATALOG COPY: BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.) (CONCENTRATION IN ENVIRONMENTAL ENGINEERING). The Environmental/Water Resources Engineering Concentration is intended for students interested in a focus in the engineering of Environmental and/or Water Resources Systems. Specialized courses will prepare students to apply fundamental knowledge in mathematics, science, and engineering to design systems that provide safe, adequate and sustainable supplies of drinking water; prevent, mitigate or remediate soil, water, and air pollution; and minimize flood hazards. Students completing the requirements described in this program will receive a special designation on their transcripts showing they have completed the environmental/water resources engineering concentration.

COURSE REQUIREMENTS:

Students must take these two courses:

- CEGR 4144: Engineering Hydrology
- CEGR 4242: Wastewater Treatment Design

Students must pick two of the following Environmental and Water Resources electives

- CEGR 4127: Green Building & Integrated Design
- CEGR 4142: Water Treatment Engineering
- CEGR 4143: Solid Waste Management
- CEGR 4145: Groundwater Hydrology
- CEGR 4146: Advanced Engineering Hydraulics
- CEGR 4147: Stormwater Management
- CEGR 4148: Open Channel Hydraulics
- CEGR 4235: Industrial Pollution Control
- CEGR 4246: Energy and the Environment
- CEGR 4247: Sustainability
- CEGR 4264: Landfill Design and Site Remediation

Through careful course selection and scheduling, a student can obtain the Environmental/Water Resources Concentration within the required 128 hour BSCE curriculum. The student must earn at least a 2.5 GPA in the selected Concentration courses.

Proposed New Courses

Based on a thorough review, the CEE Curriculum Committee and the CEE faculty strongly recommend that the eight following courses be offered as a permanent elective in the undergraduate curriculum. Therefore, a permanent course number and a permanent catalogue description are requested for the following courses.

CEGR 4148 Open Channel Hydraulics will be a new class that has never been taught. All of the remaining courses have been taught for several semesters as a “topics” course (CEGR 3090 or CEGR 4090) and have been well-received by students and well-regarded by the faculty.

1) CEGR 4148 Open Channel Hydraulics

Summary: CEGR 4148 Open Channel Hydraulics is a proposed new class that has been requested by and will be taught by Dr. James Bowen. Open Channel Hydraulics is a course that is found in most Civil Engineering Departments.

Proposed Catalog Copy: CEGR 4148 Open Channel Hydraulics: Prerequisite: CEGR 3143 or equivalent. A rigorous examination of the concepts of energy, momentum, and friction as they relate to free-surface flow in engineered and natural channels. Topics to be covered: uniform flow, normal, alternate, and conjugate depths, gradually and rapidly varied flows, flood routing, analysis and design of hydraulic structures, and computer modeling of channel hydraulics using HEC-RAS.

Course Syllabus:

Syllabus - Open Channel Hydraulics

Instructor James D. Bowen, x7-1215, jdbowen@uncc.edu

Catalog Information

CEGR 4241. Open Channel Hydraulics (3)

Prerequisite: CEGR 3143 with a grade of C or above or equivalent. A rigorous examination of the concepts of energy, momentum, and friction as they relate to free-surface flow in engineered and natural channels. Topics to be covered: uniform flow, normal, alternate, and conjugate depths, gradually and rapidly varied flows, flood routing, analysis and design of hydraulic structures, and computer modeling of channel hydraulics using HEC-RAS.

Objectives

1. Form a good understanding of the basic physical principles that govern the physical behavior of flow in engineered and natural open channels
2. Acquire analytical and mathematical skills needed to describe and predict open channel flow behavior using modern computational tools,

- Effectively apply these principles and skills {objectives 1 & 2} to the engineering solution of open channel systems problems.

Topics

Mass, Momentum, Energy Balances in Open Channels

Hydraulic resistance in uniform flow

Gradually varied flow, analytical and numerical analysis

Rapidly varying flows,

Analysis and design of hydraulics structures

Flood Routing

Introduction to HEC-RAS

Text

Chaudry, M.H. 2008. Open Channel Flow (2nd Edition), Springer, 524 p. ISBN-13: 978-0-387-30174-7

Supplementary reading: Chow, V.T., 1959. Open Channel Hydraulics, McGraw-Hill, New York, 680 p.

ISBN-13: 978-007- 010-7762

Henderson, F.M., 1966. Open Channel flow, Macmillan, New York, 522 p. ISBN-13: 978-002-353- 5109

Grading

Course grades will be based on a weighted average of grades on tests, homeworks, and a project as follows:

In-class test – 20%

Take Home Test – 20%

In-class final – 20%

Homeworks – 20%

Project – 20%

Course grades use the following scale A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: <60%

My Expectations of You

- Attend all, or nearly all of the classes,
- Arrive on time, or enter quietly if late,
- Pay attention in class all of the time, or nearly all of the time,
- Refrain from activities that disrupt others ability to pay attention,
- Participate in classroom activities, be an active learner,
- Be aware of all class assignments,
- Write neat and legible homework and test solutions, and
- Treat all others in class (students, TA, professor, guests) with courtesy and respect.

What You Can Expect from Me

- Attend all, or nearly all of the classes,
- Arrive on time,
- Provide class lectures that are instructive and engaging,
- Have lectures that cover all items in syllabus,
- Design homework assignments and tests that are of appropriate length and difficulty,
- Grade and return all homeworks and tests within 1 week,
- Provide neatly written solutions to homeworks and tests,
- Provide adequate time during class for problem solving,

- Provide adequate time during class to ask questions,
- Be available outside of class during office hours for extra help, and
- Treat all others in class (students, TA, guests) with courtesy and respect.

More on Classroom Conduct and Course Expectations

The use of cell phones, smart phones, or other mobile communication devices is disruptive, and is therefore prohibited during class except on the back two rows of the classroom. Except in emergencies, those using such devices must leave the classroom. Class time will typically include some time for cell phone use. Students should use their phones during this time only. Students may leave and return to class, but this is a disruptive behavior and should be done as little as possible.

Students are permitted to use computers and tablets during class for note-taking and other class-related work only. Those using computers during class for work not related to that class may do so only on the back two rows of the classroom.

Student Conduct & Academic Integrity

All materials submitted for grades (e.g. test and final problems, homework assignments) must represent the student's original work. Students may discuss homework problems, including comparing answers. Copying another student's work, or copying a solutions manual is strictly forbidden.

It is the responsibility of every student to know and observe the requirements of the UNCC Code of Student Academic Integrity. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any student violating the code will be subject to the penalties described in this document. If in doubt, please ask before you engage in any activity about which you are unsure.

UNC Charlotte Academic Integrity Page: integrity.uncc.edu/j

Students are responsible for meeting all class deadlines (e.g. completing homework assignments, taking tests and finals). No make-up exams are scheduled except for very special situations. Students must appear at the designated time to take in-class tests and finals to receive any credit, unless prior approval is granted for an alternate time. You will not be granted alternate test or final times afterwards.

All students are required to abide by the UNC Charlotte Sexual Harassment Policy and the policy on Responsible Use of University Computing and Electronic Communication Resources. Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards.

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.

____ This course will increase/decrease the number of credits hours currently offered by its program.

____ This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

2) CEGR 4147 Stormwater Management

Proposed Catalog Copy: CEGR 4147 Stormwater Management: (3) Prerequisite: CEGR 3141 and CEGR 3143. Introduction to the impacts and water quality parameters due to urbanization. Develop a numerical model to analyze water stormwater impacts and evaluate different mitigation methods. Understand and utilize the guiding principles of low impact design (LID) and evaluate the available BMPs and understand their limitations. (Fall)

Course Syllabus:

*CEGR 4090 Stormwater Management
2013*

Fall

(Information is subject to change)

Instructor: Dr. Bill Saunders

Office: EPIC 3368, Tel. (704) 687-1234, Email: wlsaunde@uncc.edu

Normal Office Hours: Monday from 11:00 to 12:30 PM and Tuesday and Thursday from 11:00 to Noon, and by appointment.

Class Time & Location: Tuesday and Thursday, 8:00 AM – 9:15 AM, EPIC 3226

Prerequisites: *CEGR 3143, CEGR 3141, and CEGR 3155*

Required Texts: *Stormwater Management for Smart Growth* by Allen P. Davis and Richard H. McCuen

Elements of Urban Stormwater Design by Dr. Malcom

Course Objectives: The objective of this course is to provide the student with an understanding of flooding and water quality parameters as a result of urbanization. Numerical models will be developed to analyze water quantity impacts due to urbanization and evaluate different mitigation methods. By the end of the class the student will be able to:

- Evaluate the water quantity and quality impacts due to urbanization,
- Create spreadsheets using numerical methods to design storm water detention basins,
- Understand and utilize the guiding principles of low impact design (LID),
- Evaluate the available BMPs and understand their limitations, and
- Complete a design project to mitigate storm water impacts using LID techniques and BMPs,

Grading :

Homework:	15%
Exam 1	25%
Exam 2	25%
Design Project	10%
Final Exam	25%

Student Conduct

Students will be working in groups in and out of class. Homework and group projects will be submitted as groups; however, each member is expected to equally contribute to its content. Otherwise, all materials submitted for grades (e.g. test and final problems) must represent the student's original work. Students may discuss homework problems, including comparing answers. Copying another student's work, or copying a solutions manual is strictly forbidden. It is the responsibility of every student to know and observe the requirements of the UNCC Code of Student Academic Integrity. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any student violating the code will be subject to the penalties described in this document. If in doubt, please ask before you engage in any activity about which you are unsure. The use of any electronic device other than an approved FE calculator during an exam will result in an automatic F for the course. The full code is available online at <http://www.uncc.edu/policystate/ps-105.html>. Students are responsible for meeting all class deadlines (e.g. completing homework assignments, taking tests and finals). Students must appear at the designated time for tests and finals to receive any credit.

Class Credit:

This 3-credit class requires three hours of direct faculty instruction and 6 to 9 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: required reading, library research, written assignments, Excel spreadsheets, and studying for quizzes and exams.

Use of cell phones, beepers, or other communication devices in the classroom:

Place all electronic devices in "silent" or "vibrate" mode prior to entering the classroom. The use of cell phones, beepers, or other communication devices during class is disruptive, and is therefore prohibited. Those found using cell phones during class or lab will be asked to bring doughnuts next class meeting for the entire class or write a two page paper on company policies being implemented to control cell phone usage or one letter grade reduction in your final grade. In case of an emergency, those using such devices must leave the classroom.

Class Attendance:

Attendance is required. One point will be subtracted from the final grade for each absence beyond 2 excused absences.

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
- This course will increase/decrease the number of credits hours currently offered by its program.
- This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

3) CEGR 3231 Land Development Engineering Fundamentals

Proposed Catalog Copy: CEGR 3231. Land Development Engineering Fundamentals. (3)
Prerequisite: CEGR 3161. Analysis of land development industry practices and basic business principals. Analyze land forms for implementation of practical engineering solutions based on social, economic and environmental factors. Analyze and design infrastructure planning of residential and non-residential land development projects. (Fall)

Course Syllabus:

CEGR 4090: Land Development Fall 2009

Class Time: Tuesday 5:00 pm to 7:45 pm in CARC 125

Prerequisite: CEGR 2101 and CEGR 2104

Instructor: David W. Naylor, P.E.
Lecturer, CARC 108
(704) 687-2223
dnaylor@uncc.edu

Office Hours: MTWT from 9:30 am to 10:50 am

Required Text: *Land Development Handbook, Second Edition,
The Dewberry Companies*

Course Objectives and Outcomes:

1. Objective: To review land development industry practices and basic business principles
Outcome: Demonstrate knowledge of the building industry and understand the responsibilities of the land development engineer
2. Objective: To understand government land development policies, regulations, and standards imposed at all levels of regulatory oversight
Outcome: Learn how to interpret government ordinances and achieve project entitlements
3. Objective: To analyze land forms for implementation of practical engineering solutions based on social, economic, and environmental factors
Outcome: Demonstrate knowledge of engineering concepts and infrastructure planning of residential and non-residential land development projects
4. Objective: To improve verbal and written communication skills
Outcome: Demonstrate abilities to convey technical information in written form and in a formal presentation format

Grading:	In-class Exercises & Homework	20%
	Report & Presentation I	20%
	Report & Presentation II	20%
	Midterm Exam	20%
	<u>Final Exam</u>	<u>20%</u>
	Total	100%

Homework: Unless otherwise noted, homework will be due on Tuesday at the beginning of class, one week after it is assigned. **Late submissions will be accepted (up to 2 business days) with a 20 point penalty per day. After 2 business days, late submissions will not be accepted.**

General: No makeup exams or presentations will be given without written excuse from the infirmary or notification to the instructor before the exam or presentation.

Academic Integrity:

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity. This code forbids cheating, fabrication, or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Academic evaluations in this course include a judgment that the student's work is free from academic dishonesty of any type; and grades in this course therefore should be and will be adversely affected by academic dishonesty. Students who violate the code can be expelled from UNCC. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases the course grade is reduced to F. Copies of the code can be obtained from the Dean of Students Office. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty to the course instructor.

Essays and Presentations: Each report shall be at least 4 (four) pages in length, typed and double-spaced. Style, structure and content will be graded. Each assigned presentation shall vary between 5 to 10 minutes in length. Power point presentations are encouraged with appropriate presentation material.

Class Date	Topics	Text	Assignments
Aug. 25	Overview of the Land Development Process	Chp. 1	
Sept. 1	Feasibility and Site Analysis	Chp. 1	HW #1 and Project assignment
Sept. 8	Planning and Zoning Rezoning process Role Play Exercise	Chp. 2 and 11	HW #2
Sept. 15	Plan submissions, applications and approval Regulatory process Land planning techniques Community relations and project impacts Client relations	Chp. 3, 4 and 5	HW #3
Sept. 22	Engineering Feasibility Environmental Regulations Environmental Site Assessments Historic and Archaeological assessment	Chp. 6, 7, 8 and 9	HW #4
Sept. 29	Submission of Reports and Presentations		
Oct. 6	Midterm Exam		
Oct. 13	No Class		
Oct. 20	The art of contouring – site applications	Handouts	HW #5 and Project assignment
Oct. 27	The art of contouring – site applications Market Analysis	Handouts, Chp. 9	
Nov. 3	Infrastructure planning and engineering concepts: transportation systems	Chp. 20	HW #6
Nov. 10	Infrastructure planning and engineering concepts: clearing, grading and erosion control	Chp. 24	HW #7
Nov. 17	Infrastructure Planning and Engineering Concepts: water and sewer	Chp. 25 and 26	HW #8
Nov. 24	Infrastructure Planning and Engineering Concepts: Drainage systems, stormwater management facilities and best management practices	Chp. 21 and 22	HW #9
Dec. 1	Value Engineering and Conflict Analysis Cost Factors Project Scheduling Project costs and basic proforma	Chp. 31	HW #10
Dec. 8	Submission of Reports and Presentations		
Dec. 15	Final Exam 5:00 pm to 7:30 pm		

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
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4) CEGR 3232 Land Development Engineering - Advanced Site Analysis

Proposed Catalog Copy: CEGR 3232. Land Development Engineering – Advanced Site Analysis. (3) Prerequisite: CEGR 3153 and CEGR 3161. Site assessment of land to determine infrastructure needs. Design cost effective infrastructure for residential and commercial developments. Analyze government regulations to determine site design criteria. Prepare a design for each of the major infrastructure components (roads, stormwater, sanitary sewer and water). Prepare plans in CAD for presentation of design alternatives and solutions. (Spring)

Course Syllabus:

CEGR 3090 Land Development II Spring 2014

Instructor: David W. Naylor, P.E., EPIC 3264
Office Hours: Tuesday/Thursday 11 am to 12 pm
Tuesday 1 pm to 4 pm
Class Time/Location: Thursday 5:30 pm – 8:15 pm in EPIC 1140
Prerequisites: CEGR 3161 Transportation Engineering
Required Text: *Land Development Handbook, The Dewberry Companies, 2nd Edition or 3rd edition*

Supplemental Text: *Residential Land Development Practices, 3rd Edition*
David E. Johnson, P.E., P.P.
Land Development for Civil Engineers, 2nd Edition,
T. R. Dion, P.E. & L.S., LLC
Instructor Handouts

Course Objectives and Outcomes:

1. Objective: To understand land evaluation and site analysis techniques used in assessing land for development purposes
Outcome: Demonstrate knowledge of technically reviewing property for opportunities and constraints to cost effective land development
2. Objective: To achieve value engineering solutions through understanding and interpretation of government site design regulations and criteria
Outcome: Demonstrate understanding of how to find pertinent land development standards and apply regulations in design
3. Objective: To learn residential infrastructure design approaches for; water, sewer, roads, drainage, stormwater management, best management practices, and grading elements
Outcome: Prepare a design for each infrastructure element and analyze the interrelation of the project components.
4. Objective: To understand environmental sustainable design concepts for land development design integration
Outcome: Demonstrate the understanding of stormwater management and best management practices design approaches for land development projects
5. Objective: To use automated drafting and graphics for presentation of land development design alternatives and solutions
Outcome: Prepare plans and graphics using automated drafting resources

General:

Class format will be a combination of lectures, project designs and class presentations. The coursework will include project assignments to be completed outside of class and submitted in graphic and report form. AutoCad files will be provided for the case study.

No makeup exams will be given without a written excuse to the instructor before the exam or presentation.

Attendance at work sessions is mandatory. If you miss a work session, then there will be a 10 point deduction from your grade on the components that the work session is intended for.

Grading:

Component 1: Parcels/Setbacks/Lot fit matrix	10%
Component 2: Roadway-horizontal	10%
Component 3: Roadway-vertical	10%
Component 4: Storm Drainage	10%
Component 5: Sanitary Sewer	10%
Component 6: Water	10%
Component 7: Erosion Control	10%
Component 8: Quantity takeoff and costs	10%
Final Exam	20%
	100%

Homework:

Unless otherwise noted, each component will be due at the beginning of class on the date it is due. There will be a 10 point deduction for each late day and no assignment will be accepted more than three days late.

Credit Hours:

This 3-credit course requires 3 hours of classroom or direct faculty instruction and 6 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: required reading, library research, studio work, written assignments, and studying for quizzes and exams.

Electronic Devices:

If you desire to use a laptop or tablet to take notes during class, this is acceptable. However, you should not use those devices for other purposes during class, such as doing homework for another class, checking email or facebook, etc. Calculators are acceptable and encouraged for use in class. Phones, pagers, and all other electronic devices SHALL be turned off during class. This is your first warning. If these electronic devices are disruptive to class (I make the determination if it is disruptive), you will be required to complete an additional assignment for each occurrence. Failure to complete the assignment will result in a one letter grade reduction on your final course grade.

Tentative Schedule

Class Date	Topics	Text Reference	Component Due Dates
Jan. 9	Class Orientation Case Study Discussion, Zoning Requirements, Lot Fit Matrix, parcel creation and clearing	Chapters 1, 2 and 12	
Jan. 16	Work Session		
Jan. 23	Roadway Design - Horizontal and Vertical Alignment	Chapter 20	Component 1 Due
Jan. 30	Work Session		
Feb. 6	Work Session		
Feb. 13	Snow		
Feb. 20	Work Session		
Feb. 27	Sanitary Sewer Lines and Water Lines	Chapters 25 and 26	Components 2 and 3 Due
Mar. 6	Spring Break – No class		
Mar. 13	Work Session		
Mar. 20	Storm Drainage Design Post Development Drainage Area Plan Infrastructure Conflict Assessment	Chapter 21	Water and Sewer due
Mar. 27	Work Session		
Apr. 3	Erosion Control	Chapter 29	Stormwater due
Apr. 10	Work Session		
Apr. 17	Quantity Takeoff and costs	Chapter 31	Erosion Control due
Apr. 24	Discussion of overall project, review for final exam		Quantity takeoff due
May 1	FINAL EXAM		

Academic Integrity:

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Students are expected to submit their own work, either as individuals or contributors to a group assignment. Definitions and examples of

plagiarism and other violations are set forth in the Code. The Code is available from the Dean of Students Office or online at: <http://www.legal.uncc.edu/policies/ps-105.html>.

Faculty may ask students to produce identification at examinations and may require students to demonstrate that graded assignments completed outside of class are their own work.

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
- This course will increase/decrease the number of credits hours currently offered by its program.
- This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

Homework: **Unless otherwise noted, homework will be due at the beginning of class, one week after it is assigned. No late homework will be accepted.**

General: Class format will be a combination of lectures and team study exercises. Students should expect substantial work and team meetings to be completed outside of the regularly scheduled class time. The lack of quality in the final product will easily be discernable and be reflective of the lack of time commitment by the student team.

Students will be evaluated on their case study portfolio's, planning concepts, engineering design approaches, project viability and regulatory compliance. Impromptu speaking exercises should be expected for practice and will not be graded.

No makeup exams or presentations will be given without written excuses to the instructor before the exam or presentation.

The University's Academic Integrity Code will be enforced. First offense results in an F and second offense in suspension.

Studio Assignment: Students will be assigned in small design teams working to prepare a subdivision or site plan design for a parcel of land. They will also be required to prepare a report and present their design for each project. The design should be submitted in AutoCad format.

Students should bring to each class: engineering scale, pencils, tracing paper, markers, calculator and other drafting equipment as needed for drawing purposes.

Students will be given an AutoCad file of the property boundary and topographic survey for use in preparing each project design.

Date	Land Development Studio Topics	Text Reference	Homework Assignments
1/15	Class Orientation & Team Assignments	Chapter 1	HW # 1
1/22	Single Family Subdivision LID, LEED, & Sustainability Design Individual Team Instruction & Appt Sign-up	Chapter 2	HW # 2 Question # 4
1/29	Single Family Subdivision Team Appointments – Progress Review	Chapter 3	HW # 3 Question # 1
2/5	Single Family Subdivision Value engineering, W & S layout Sample Presentation Quantity Takeoff and costs Single Family Proforma In-class exercise	Chapter 4	HW # 4 In-class Project Proforma

2/12	Single Family Subdivision Submission of Plan and Report. Presentation of Plan		
2/19	Multifamily Site Plan 36 acre Parcel Specific Design Goals, building sizes, amenity, parking requirements Bulk Requirements Engineering Standards & Design Criteria Plan, Report, & Presentation Guidelines	Chapter 11	HW # 5 Question # 1
2/26	Multifamily Site Plan Water, Sewer, Recycling, Garages, Fire access, hardscape elements Parking Lot Drainage In-class Exercise Appointment Sign-up	Chapter 12	HW # 6 Question # 3
3/5	No Class		
3/12	Multifamily Site Plan Team Appointments – Progress Review		
3/19	Multifamily Site Plan Contouring Exercise In-class Exercise Infrastructure design review – team assistance Commercial Site Plan In-class Exercise	Chapter 13	HW # 7 & 8 In-class
3/26	Multifamily Site Plan Submission of Plan and Report Presentation of Plan		

4/2	Mixed Use Land Plan Bulk Requirements Specific Design Goals Alternative Land Uses	Chapter 7	
4/9	Mixed Use Land Plan Engineering Standards and Design Criteria Project Budgets, Offsite Impacts, Common Area Amenities, Phasing, Master Developer Plan, Report, & Presentation Guidelines Appointment Sign-up	Chapter 8 & Chapter 14	
4/16	Mixed Use Land Plan Team Appointments – Progress Review		
4/23	Mixed Use Land Plan Submission of Plan & Report Presentation of Plan		
4/30	Vertical Mixed Use Site Plan In-class exercise Review for Final		HW # 9 & 10 In-class
5/7	Final Exam 5:00 pm – 7:30 pm		

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
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6) CEGR 4247 Sustainability

Proposed Catalog Copy: CEGR 4247. Sustainability. (3) Prerequisite: CEGR 3141. The course will focus on sustainability as it applies to civil engineering, including land development choices, infrastructure planning, material selection and disposal, energy sources, and water supply and treatment. Methods of assessing sustainability and incorporating sustainable features in design will be reviewed.

Course Syllabus:

CEGR 4247: SUSTAINABILITY

Lecture Schedule: XXXXXX, Location: XXXXXX

SCOPE The course will focus on sustainability as it applies to civil engineering, including land development choices, infrastructure planning, material selection and disposal, energy sources, and water supply and treatment. Methods of assessing sustainability and incorporating sustainable features in design will be reviewed.

TEXTBOOK Sustainable Design: The Science of Sustainability and Green Engineering. Daniel A. Vallero & Chris Brasier. Wiley; 1st edition.

INSTRUCTOR Dr. Brett Tempest
EPIC 3327, 704-687-1236
Brett.tempest@uncc.edu

Office hours: XXXXXX

Dr. Jim Bowen
EPIC 3325, 704-687-1215
jdbowen@uncc.edu
Office Hours: XXXXXX

**TEACHING
ASSISTANT**

STUDENT CONDUCT

Students are responsible to read and adhere to the requirements of *the UNC Charlotte Code of Student Academic Integrity* (latest revision). This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and a further substantial reduction of the course grade. In almost all cases, the course grade is reduced to an "F". Copies of the code can be obtained from the Dean of Student Office. The Civil Engineering Department policy is that ALL instances of suspected cheating be handled according to *the UNC Charlotte Code of Student Academic Integrity* (latest revision).

The use of cell phones, beepers, or other communication devices during class is tacky and disruptive, and is therefore prohibited. Those using such devices must leave the classroom for the remainder of the class period. This includes texting.

ACCOMODATIONS

Your success in this class is important to the instructors. If you require special accommodations for a disability, please first contact the Office of Disability Services and collect the appropriate documentation. Once this is done, alert the instructor as soon as possible so that so that proper learning and evaluation strategies may be adapted.

COURSE LEARNING OBJECTIVES

Students will be provided with presentations, materials, and opportunities that will help them learn to do the following:

- Articulate a good definition of sustainable development
- Argue the scientific case for designing sustainably in the future
- Describe several key interdisciplinary issues related to sustainability
- Describe several discipline-specific issues related to sustainability
- Explain some of the key features that distinguish sustainable design from conventional design
- Assess the sustainability of land development designs, material selection, energy options, and water management plans
- Conduct a life cycle analysis
- Apply typical certification systems and software packages to design a sustainable structure

COURSE DESCRIPTION

The course will include lectures (including guest presentations); homework (that may take the form of calculations, short answer, essays, inquiry-based activities, presentations, and small projects); class participation; two tests and a final examination. All team submissions will include peer evaluations that will be incorporated into each individual's grade. There will also be a requirement to attend some out-of-class events or negotiate some alternative activities.

GRADING Course letter grades will be based on the following scale:

A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: <60

Grades can be roughly calculated based on the following weights:

Tests (2)	10% each
Homework (10)	3% each
In-class assignments and Quizzes	10%
Project	20%
Final Exam	15%
Attendance & Participation	5%

CLASS TOPICS

Unit	Topic	Description	Reading	Reading Due
1	Intro: Science and Sensibility	What are we trying to sustain? What is an ecosystem? An Ecological Footprint? What are the three pillars of sustainability? How does the latest science inform engineering design? How can that science be conveyed to the general public? How is that science likely to change public policy? What role does the engineer have in translating the science into design?	Chapter 1	1/11
2	Science for Sustainable Designers	Resource and Nutrient Cycles, Biomimicry, Energy and Thermodynamics, Earth Science, Pollutants	Chapter 2	1/18
3	Risk, Responsibility and Policy	Tragedy of the commons, precaution, uncertainty and a history of attempts at environmental policy	Chapter 3,5	1/25
4	Design Processes	Sustainable design can be thought of as design that wrings out all material and energy inefficiencies. How can new planning methods improve design and mechanical efficiencies? Integrated design.	Chapter 1,5	2/1
5	Indicators and Assessments	How can indicators be used for benchmarking? Assessing a material? A practice? A project? A community? A company? What makes a good indicator? LCA, LEED, IGBC, ASHRE, Ecological Footprinting, etc.	As Assigned	2/15
6	Buildings and Materials	What defines sustainable building design, construction, finishing, operation, construction waste management? What criteria should an engineer use to compare buildings/materials/practices with respect to sustainability? What are the LEED building standards and how were they developed?	As Assigned	2/27
7	Waste	How can C&D waste be kept out of landfills? Recycling, Reuse, Deconstruction, Optimized design. Waste=Food	As Assigned	3/14
8	Water	Water quality, watersheds, stormwater, restoration of urban watercourses, policies related to watershed protection, LID	As Assigned	3/26
9	Energy	Carbon, renewables, local production, energy policy, energy economics	Chapter 7	4/9
10	Urban Zones	Planning, zoning, heat islands, corridors.	Chapter 4	4/16
11	Social Sustainability	When would an engineer ever have to deal with a social impact? What constitutes a social factor or	Chapter 6	4/23

		impact? How would they be measured? How can they be compared from one culture to another?		
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For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
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- This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

7) CEGR 4273 Engineering Ground Improvement

Proposed Catalog Copy: CEGR 4273. Engineering Ground Improvement. (3)

Prerequisites: CEGR 3278 and CEGR 3258. Engineering principles of soil improvement as they relate to applications in both geotechnical and geoenvironmental engineering; innovative techniques to improve soils to meet technical and economic requirements.

Course Syllabus:

CEGR 4090

Soil Improvement in Geotechnical and Geoenvironmental Engineering

Instructors: Dr. Vincent Ogunro

CARC 260

Tel. 704/687-3101

Email: vogunro@uncc.edu

Office Hours: Mondays, 11:00 AM – 1:00 PM

Wednesdays, 11:00 AM – 12 noon

Fridays, 11:00 AM – 1:00 PM

Class Time: Tuesdays and Thursdays, 11:00 AM – 12:20 PM

Class Location: CARC 274

Prerequisites: CEGR 3278, Geotechnical Engineering or consent of Department

Reference Texts: Because of the multitude of sources of relevant information and the unique nature of this course, no single textbook is required. Notes and relevant material will be provided and the following texts may serve as reference material.

“Engineering Principles of Ground Modification” Hausmann, M.R. 1990, McGraw-Hill.

“Ground Control and Improvement” Xanthakos, P.P., Abramson, L.W. and Bruce, D.A. 1994, John Wiley and Sons.

“Foundation Engineering Handbook” Fang, H-Y. Editor, 1991 Van Nostrand Reinhold.

Summary: This course is targeted for advanced undergraduates and will focus on engineering principles of soil improvement as they relate to applications in both geotechnical and geoenvironmental engineering. Most all civil/environmental construction projects are built on, in or with soil. As urban and industrial development continues to grow, attention is given to previously ignored sites where the soil properties are physically or chemically deficient. Fortunately, there are a variety of innovative techniques that can be used to improve soils to meet technical and economic requirements.

Goals: The objectives of this course are to review soil properties and the need for soil improvement, densification of soils through deep and shallow compaction; vibrocompaction, vibroreplacement, dewatering through consolidation, drainage, pumping and electrokinetics; modification through heating

and freezing techniques; reinforcement with geosynthetics; grouting, stabilization with additives including industrial by-products and waste materials.

Outcomes: After completion of this course, students should be able to specify and apply techniques to improve soils that are otherwise unsuitable for use in geotechnical and geoenvironmental applications.

Geotechnical Engineering Review

Week 1: 8/21/07 & 8/23/07

Introduction, soil improvement applications, difficult soils, site investigation

Week 2: 8/28/07 & 8/30/07

Flow through soils, well drawdown, effective and total stress, surcharge

Week 3: 9/4/07 & 9/6/07

Shear strength in sands, clays.

Week 4: 9/13/07 (No class on 9/11/07)

Bearing capacity and consolidation

Week 5: 9/18/07 & 9/20/07

Slope stability and earth pressure

Week 6: *EXAM 1 – 9/25/07 and Site Visit*

Physical Methods

Week 7: Lecture 6 - 10/2/07 - & 10/4/07

Preloading, vertical drains, pumping

Week 8: Lecture 7 - 10/11/07 (No classes on 10/9/07 student recess)

Vibrofloatation, vibroreplacement

Week 9: 10/16/07 & 10/18/07

Blasting, dynamic compaction

Week 10: 10/23/07 & 10/25/07

Freezing, heating

Week 11: 10/30/07 & 11/1/07

Geosynthetics

Week 12: *EXAM 2 – 11/6/07 and site visit / project progress evaluation*

Chemical Methods

Week 13: 11/13/07 & 11/15/07

Grouting

Week 14: 11/20/07 (No classes on 11/22/07, Thanksgiving)

Deep soil mixing

Week 15: 11/27/07 & 11/29/07

Electrokinetics

Week 16: 12/4/01

Admixtures, lime, Utilization of waste materials

EXAM 3 – 12/11/07

Tentative Grading:

Exam 1: 20%

Exam 2: 20%

Exam 3: 20%
Homework: 20%
Final Project: 20%

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
- This course will increase/decrease the number of credits hours currently offered by its program.
- This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.

8) CEGR 4276 Natural Hazards

Proposed Catalog Copy: CEGR 4276. Natural Hazards (3) Prerequisite: CEGR 3278, 3141, 3143, 3122, 3161 and 3225. Natural hazards dealing with the earth natural processes such as earthquakes, volcanoes, flooding, landslides, and severe weather events will be covered. The basic understanding of the different natural hazard processes and mechanisms will be presented within the context of the earth's internal and external energies. The course will also provide students with a solid understanding of risk as it relates to the potential consequences and impacts to human population and the built environment. This initial part of the course will form the foundation for the second part of the course which includes presentation of the basic principles of risk management of natural hazards within the context of civil and environmental engineering. The final portion of the course also covers risk mitigation strategies which are discussed within the challenging context that includes a rapid ongoing population growth and the constantly changing land use which affects societal levels of risk acceptance from natural hazards.

Course Syllabus:

CEGR 4090-G01: NATURAL HAZRDS (3 Credit Hours)
Civil and Environmental Engineering Department, UNC Charlotte

Instructor: Dr. Vincent Ogunro

EPIC 3328

Tel. 704/687-1230

Email: vogunro@uncc.edu

Office Hours: Monday and Wednesday: 12:30 PM – 2:30 PM

Class Time: Mondays and Wednesdays 8:00 AM – 9:15 AM

Class Location: EPIC 3226

Prerequisites: Consent of the Department and Instructor

Text: No required textbook at this time

References: - Federal Emergency Management Authority (FEMA) Documents
-Technical Reports and Manuscripts
-NOAA, and USGS Websites

COURSE OBJECTIVES:

The goal of this course is to investigate a variety of natural hazards that impact natural and built environments, and to identify a range of mitigation measures which can be taken to protect human lives and reduce damages and costs to infrastructure. The course will cover processes of some of these natural hazards, propose engineering mitigations and management solutions, and investigate planning schemes for preventive measures and hazards assessment. Furthermore, this class will investigate the impact of infrastructure development on environmental systems including the atmosphere, biosphere, hydrosphere and lithosphere. Topics could include impacts on air quality, ecology, erosion, sedimentation, water quality, and water quantity.

COURSE GRADING PLAN:

Course Grade: (A=90-100, B=80-89, C=70-79, D=60-69, F=<60). Grades can be roughly estimated from the following:

Assignments	20%
Projects & Presentations	15%
Quizzes	10%
Exam 1	20%
Exam 2	35%

Note: grading plan is subject to change during the semester at the instructor's discretion, after notifying the class of the changes

Attendance Requirement: (100% attendance required). Students are expected to attend all classes and to arrive punctually; failure to do so will result in a lower class participation grade. Any absence that is predictable should be discussed with the course instructor in advance.

General: No extra credit assignments will be given. No makeup exams will be given except when proper notification or excuse provided before the exam. Concern about quiz grading should be expressed in writing and turned in with the quiz for consideration.

STUDENT CONDUCT:

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (<http://www.legal.uncc.edu/policies/ps-105.html>). This code forbids cheating, fabrication, or falsification of information, multiple submission of academic work, **plagiarism**, abuse of academic materials, and complicity in academic dishonesty. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to "F". Copies of the code can be obtained from the Dean of Students Office. UNC Charlotte policy is that ALL instances of suspected cheating be handled according to The UNC Charlotte Code of Student Academic Integrity (<http://www.legal.uncc.edu/policies/ps-105.html>).

PROJECT REPORT & PRESENTATION:

Every student presenter will be responsible for preparing a project report based on the assigned topic. The written report is due at 12 noon on May 9th, 2014 in my office. The written report should provide a detailed discussion of the topic, an analysis of the recent practices/studies, and should also include proposed practical solutions and critique of the current practices. Written reports not submitted on time and in proper format will not be accepted without a valid excuse and will cause the student to lose points.

Course Schedule.

WEEK	CLASS	DATE ('14)	SUBJECT
1	1	01/08	Introduction Course Overview
2	2 & 3	01/13 - 15	
3	4	01/20	Martin Luther King, Jr. Day (School Closed)
	5	01/22	Basic Geology and Plate Tectonic
4	6	01/27	Designing for Natural Hazards
	7	01/29	Review of Soil Mechanics
5	8	02/03	Landslide Hazards
	9	02/05	
5	10	02/10	Land Subsidence
	11	02/12	
6	12	02/17	Flooding Hazards
	13	02/19	
7	14	02/24	Coastal Erosion / Exam 1
	15	02/26	
8	16	03/03	Spring Break
	17	03/05	
9	18	03/10	Coastal Erosion cont./Hazard Management
	19	03/12	
10	20	03/17	Seismic Hazards
	21	03/19	
11	22	03/24	Tsunamis
	23	03/26	
12	24	03/31	Volcanoes
	25	04/02	
13	26	04/07	Tornadoes
	27	04/09	
14	28	04/14	Hurricanes
	29	04/16	
15	30	04/21	Review of Other Hazards
	31	04/23	
16	32	04/28	Course Review
	33	04/30	Reading Day
17	34	05/05	Final Exam
	35	05/09	Deadline to submit project (12 noon)

For a new course or revisions to an existing course, check all the statements that apply:

- This course will be cross listed with another course.
- There are prerequisites for this course.
- There are corequisites for this course.
- This course is repeatable for credit.
- This course will increase/decrease the number of credits hours currently offered by its program.
- This proposal results in the deletion of an existing course(s) from the degree program and/or catalog

1. ACADEMIC PLAN OF STUDY (UNDERGRADUATE ONLY): Does the proposed change impact an [existing Academic Plan of Study](#)?

- Yes. If yes, please provide updated Academic Plan of Study in template format.
 No.

2. STUDENT LEARNING OUTCOMES (UNDERGRADUATE & GRADUATE): Does this course or curricular change require a change in Student Learning Outcomes (SLOs) or assessment for the degree program?

- Yes. If yes, please provide updated SLOs in template format.
 No.

3. TEXTBOOK COSTS: It is the policy of the Board of Governors to reduce textbook costs for students whenever possible. Have electronic textbooks, textbook rentals, or the buyback program been considered and adopted?

- Yes. Briefly explain below.
 No. Briefly explain below.

The Department strives to have our course textbooks selected and reported within the time frame set by the University to support the buyback program.

IMPORTANT NOTE: A Microsoft Word version of the final course and curriculum proposal should be sent to facultygovernance@uncc.edu upon approval by the Undergraduate Course and Curriculum Committee and/or Graduate Council chair.