



College of Engineering

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E-mail engosu@osu.edu

Date: 25 February 2008

To: Randy Smith
Vice Provost, Office of Academic Affairs

From: Ed McCaul 
Secretary College of Engineering Committee on Academy Affairs

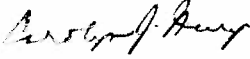
Subject: Changes to the Civil Engineering Major

Attached is a copy of the Department of Civil and Environmental Engineering and Geodetic Science's proposed changes to the Civil Engineering Curriculum. (The signed copies of the course requests will be sent to you as a hard copy.) After a review and discussion the College's Committee on Academic Affairs (CCAA) unanimously approved this proposal on the 25th of February 2008. If you have any questions concerning this proposal please let me know.



470 Hitchcock Hall
2070 Neil Avenue
Columbus, OH 43210-1275

Phone (614) 292-2771
Fax (614) 292-3780

To: Ed McCaul
From: Carolyn Merry 
Subject: CE660, CE405, CE406 course changes
Date: January 7, 2008

Enclosed please find new course forms and course change forms for the subject Civil Engineering courses. Our purpose is to improve our Capstone Design sequence in the Civil Engineering program by adding a second course to the design sequence normally taken in the senior year. Other proposed changes to CE405 and CE406 are designed to accomplish our goals without changing the hours required for graduation.

RATIONALE

The Civil Engineering program has historically used a Capstone Design model that introduces the Capstone Design venue to sophomores/juniors relatively early in their Civil Engineering program. Specifically, there is one hour of capstone design content in CE405 and one hour in CE406. CE405 must be taken as a first course upon acceptance into the Civil Engineering major, and most students take CE406 soon thereafter. CE660, the 4 hour capstone design course, is taken by seniors within two quarters of graduation.

Feedback from students indicates that, while CE660 is very beneficial, one ten-week quarter does not permit undertaking as challenging projects as could be accomplished in two quarters.

The Program proposes to modify the capstone design experience by requiring two three-hour courses in the senior year. These courses will have an umbrella number, CE660, and will consist of two specific letter-graded courses, CE660.01 and CE660.02, each of which will be 3 hours. The hours required will be achieved by reducing CE405 and CE406 by one hour each and adding the two hours to the CE660 sequence. Thus there will be no net change in hours in the curriculum. There will also be no net change in content.

TRANSITION PLAN

All students entering the curriculum during or after Autumn quarter, 2008 will be under the new program.

Technically, students currently in the pipeline have a right to graduate under the present program. Nevertheless, we anticipate that most students will opt to do the new program voluntarily. Therefore, we are proposing a transition program that will allow these

students to graduate with no increase in hour requirements. Specifically, students wishing to voluntarily switch to the new program who have already taken CE405 and/or CE 406 will be allowed to apply their extra hour(s) in these courses toward Technical Elective requirements. We currently have 1, 2, 3 and 4 hour courses available as technical electives, thus students can meet degree requirements without forced overruns in hours.

Students who wish to exercise their right to graduate under the present requirement (CE660 - 4 hours) will take CE660.01 for three hours and take one hour of designated CE693 concurrently.

TECHNICAL COMMUNICATIONS AND THIRD WRITING COURSE

The Civil Engineering Department will continue to use the Portfolio Model to provide ABET technical communications components and to provide the equivalent of a Third Writing Course. Previously, the Technical Communications Portfolio was graded in CE660. Under the new program, it will be graded in CE660.02.

OHIO STATE COURSE CHANGE REQUEST

College Engineering

Department Civil Engineering Book 3 Listing: Civil Engineering
(e.g., Portuguese)

Proposed Effective Qtr/Yr: SU AU WI SP YEAR: 08
(See OAA Academic Organization and Curriculum Handbook for Deadlines)

A. Course Offerings Bulletin Information. Follow instructions in the *OAA Academic Organization and Curriculum Handbook*. Before you fill out the "Present Course" information, be sure to check the latest edition of the Course Offerings Bulletin and subsequent Circulating Forms. You may find that the changes you need have already been made or that additional changes are needed.

* If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

COMPLETE ALL ITEMS THIS COLUMN

Present Course

1. Book 3 Listing: Civil Engineering
2. Number: 660
3. Full Title: Civil Engineering capstone design
4. 18-Char. Transcript Title: _____
5. Level and Credit Hours U 4
6. Description: Culminating course in the curriculum for students in Civil Engineering (25 words or less)
7. Qtrs. Offered : SU AU WI SP
1st SEM 2nd SEM
8. Distribution of Contact Time: 4 cl
(e.g., 3 cl, 1 3-hr lab)
9. Prerequisite(s): _____
10. Exclusion: _____
(Not open to...)
11. Repeatable to a maximum of _____ credits.
12. Off-Campus Field Experience: _____
13. Cross-listed with: _____
14. Check the curricular requirement this course fulfills:
BER LAR GEC 3rd writing course
15. Grade option (circle): Ltr S/U P
If P graded, what is the last course in the series? _____
16. Is an honors version of this course available? Y NX
Is an Embedded Honors version of this course available? Y NX
17. Other general course information: _____

COMPLETE ONLY THOSE ITEMS THAT CHANGE

Changes Requested

- (This will become the generic course for CE660.01 and CE660.02)
- _____
- _____
- (omit)
- Two courses in an integrated sequence constituting a Civil Engineering design experience including technical communications.
- _____
- SU AU WI SP
1st SEM 2nd SEM
- _____
- (omit)
- _____
- Repeatable to a maximum of _____ credits.
- _____
- _____
- Cross listed with: _____
- Check the curricular requirement this course fulfills:
BER LAR GEC 3rd writing course
- Grade option (circle): Ltr S/U P
- Last course in Progress series: _____
Y N

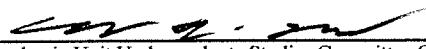
B. General Information:

- 1. Do you want prerequisites enforced electronically? YES NO
(See OAA Academic Organization and Curriculum Handbook for what can be enforced.)
- 2. Does this course currently satisfy any GEC requirement? YES NO
- 3. What other units require this course?
Have these changes been discussed with those units? YES NO
- 4. Have these changes been discussed with academic units that might have a jurisdictional interest in the subject matter?
[Attach relevant letters.] YES NO
- 5. Is the request contingent upon other requests? YES NO

List: **CE660.01, 660.02, 405, 406**

- 6. Purpose of the proposed change. (If the proposed change affects the content of the course, attach a revised syllabus and course objectives.)
To make this a generic course.
- 7. Describe any changes in library, equipment or other teaching aids needed as a result of the proposed change:
- 8. If the proposed change involves budgetary adjustments, describe the method of funding:

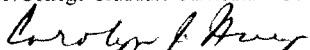
APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed


	Charles Moore	12/07/07
Academic Unit Undergraduate Studies Committee Chair (Undergrad course)	Printed Name	Date

Academic Unit Graduate Studies Committee Chair((Undergrad/Graduate course)	Printed Name	Date
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School /College Undergrad Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
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School /College Graduate Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
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 12-17-07	Carolyn Merry	12/07/07
ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR	Printed Name	Date

	E. McCann	26 Feb 08
COLLEGE DEAN	Printed Name	Date

Graduate School (If Appropriate)	Printed Name	Date
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ASC Curriculum Committee Chair (If Appropriate))	Printed Name	Date
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University Honors Center (If Appropriate)	Printed Name	Date
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Office of International Education (study tour only)	Printed Name	Date
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ACADEMIC AFFAIRS	Printed Name	Date
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College: **Engineering**Academic unit: **Civil Engineering**Book 3 Listing: **Civil Engineering**

(e.g., Portuguese)

Proposed

Course No: **660.01**Full Title of Course: **Civil Engineering capstone design**Proposed Effective Qtr/Yr: SU AU WI SP YEAR: **08** (See OAA Academic Organization and Curriculum Handbook for Deadlines)**A. Course Offerings Bulletin Information.** Follow instructions in the OAA Academic Organization and Curriculum Handbook.**Is this a course with decimal subdivisions?** If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.18-Character Transcript Abbreviation: **CIVENGCAPDES1**Level U X G P Credit Hours: **3**Description (not to exceed 25 words): **First course in a two course capstone design sequence.**Quarter offered (check): SU AU WI SP *Distribution of class time/contact hours: **3 cl**
Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here) Prerequisite (s): **Sr. standing in Civil Engineering. Must be taken as close to graduation as possible.**

Exclusion or limiting clause:

Repeatable to a maximum of **_0_** credit hours.

Cross-listed with:

Grade Option (Please check): Letter S/U Progress If this course is Progress graded, what course is the last one in the series? **CE660.02**

Honors Statement:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	GEC:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Admission Condition
Off-Campus:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	EM:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Course: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Embedded Honors Statement:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Service Learning Course*:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			

*To learn more about this option, please visit <http://artsandsciences.osu.edu/currofcl/>

Other General Course Information:

(e.g. "Taught in English." "Credit does not count toward BSBA degree.")

Subject Code _____ Subsidy Level (V, G, T, B, M, D, or P) _____
(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)Will course be taught in distance learning format: Yes No **B. General Information:**1. Provide the rationale for proposing this course:
(See attached statement)2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
This course is (check one) Required Elective Other (Explain)

* If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.

No new resources required. No net change in hours.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?

Yes X No List: CE660, 660.02, 405, 406

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: CE660.02

6. Expected section size: 30 Proposed number of sections per year: 3

7. Do you want prerequisites enforced electronically? (See OAA Curriculum Manual for what can be enforced.) Yes X

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (List units and attach letters and/or forms): Not Applicable X Internal reallocation of hours.

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA Curriculum Handbook.

APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

Charles Moore 12/07/07
Academic Unit Undergraduate Studies Committee Chair (Undergraduate course) Printed Name Date

Academic Unit Graduate Studies Committee Chair(Undergraduate/Graduate course) Printed Name Date

School /College Undergrad Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

School /College Graduate Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

Carolyn Merry 12/7/07
ACADEMIC UNIT CHAIR /SCHOOL DIRECTOR Printed Name Date

E. McCaul 26 Feb 08
COLLEGE DEAN Printed Name Date

Graduate School (If Appropriate) Printed Name Date

ASC Curriculum Committee Chair (If Appropriate)) Printed Name Date

University Honors Center (If Appropriate) Printed Name Date

Office of International Education (study tour only) Printed Name Date

ACADEMIC AFFAIRS Printed Name Date

Department, Number, and Title of Course:

CE 660.01: Civil Engineering Capstone Design I

Catalog Description: First course in a two course capstone design sequence.**Required or Elective:** Required**Lecture/Laboratory Schedule:** group study in a professional workgroup**Credit Hours** (and quarter(s) offered): 3 hour, (Autumn, Winter, Spring)**Prerequisite(s):** Sr standing in Civil Engineering. Must be taken as close to graduation as possible.**Textbook(s) and/or Other Required Material:** N/A**Course Objectives** (and program outcomes addressed):

1. Learn to evaluate designs and create improved designs. (c, e, f, k)
2. Learn to function as a part of a professional team. (c, d, e, f, g, k)
3. Learn to create group reports. (d, g)
4. Learn to make effective oral presentations. (g)

Topics Covered (and approximate time distribution):

This course does not consist of topics. Rather the students work in a group environment with the instructor serving in the role of an outside consultant interacting in a professional manner with the groups.

Distribution of Hours Toward Meeting the Professional Component:

Mathematics:

Basic Sciences:

Engineering Topics: 2

General Education: 1

Relationship of Course to Program Objectives:

Civil Engineering Program Objectives (1-5) Addressed: 1, 2, 4, 5

Relationship of Course to Program Outcomes (a)-(k):

ABET Program Outcomes: c, d, e, f, g, k

Faculty Member Preparing Description: Bill Wolfe **Date:** December 7, 2007

College: **Engineering**Academic unit: **Civil Engineering**Book 3 Listing: **Civil Engineering**

(e.g., Portuguese)

Proposed

Course No: **660.02**Full Title of Course: **Civil Engineering capstone design**Proposed Effective Qtr/Yr: SU AU X WI SP YEAR: **08** (See OAA Academic Organization and Curriculum Handbook for Deadlines)**A. Course Offerings Bulletin Information.** Follow instructions in the OAA Academic Organization and Curriculum Handbook.

Is this a course with decimal subdivisions? If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.

18-Character Transcript Abbreviation: **CIVENGCAPDES2**Level U X G P Credit Hours: **3**Description (not to exceed 25 words): **Second course in a two course capstone design sequence.**Quarter offered (check): SU AU X WI X SP X *Distribution of class time/contact hours: **3 cl**
Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here) Prerequisite (s): **Sr. standing in Civil Engineering. Must be taken as close to graduation as possible.**

Exclusion or limiting clause:

Repeatable to a maximum of **_0_** credit hours.

Cross-listed with:

Grade Option (Please check): Letter X S/U Progress If this course is Progress graded, what course is the last one in the series? **CE660.02**

Honors Statement:	Yes <input type="checkbox"/> No X	GEC:	Yes <input type="checkbox"/> No X	Admission Condition
Off-Campus:	Yes <input type="checkbox"/> No X	EM:	Yes <input type="checkbox"/> No X	Course: Yes <input type="checkbox"/> No X
Embedded Honors Statement:	Yes <input type="checkbox"/> No X			
Service Learning Course*:	Yes <input type="checkbox"/> No X			

*To learn more about this option, please visit <http://artsandsciences.osu.edu/currofc/>

Other General Course Information:

(e.g. "Taught in English." "Credit does not count toward BSBA degree.")

Subject Code _____ Subsidy Level (V, G, T, B, M, D, or P) _____
(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)Will course be taught in distance learning format: Yes No X**B. General Information:**1. Provide the rationale for proposing this course:
(See attached statement)2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
This course is (check one) Required X Elective Other (Explain)

* If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.

No new resources required. No net change in hours.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?

Yes X No List: CE660, 660.01, 405, 406

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: CE660.01

6. Expected section size: 30 Proposed number of sections per year: 3

7. Do you want prerequisites enforced electronically? (See OAA Curriculum Manual for what can be enforced.) Yes X

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (List units and attach letters and/or forms): Not Applicable X

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA Curriculum Handbook.

APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

Charles Moore 12/07/07
Academic Unit Undergraduate Studies Committee Chair (Undergraduate course) Printed Name Date

Academic Unit Graduate Studies Committee Chair(Undergraduate/Graduate course) Printed Name Date

School /College Undergrad Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

School /College Graduate Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

Carolyn Merry 12/07/07
ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR Printed Name Date

E. McCaul 26 Feb 08
COLLEGE DEAN Printed Name Date

Graduate School (If Appropriate) Printed Name Date

ASC Curriculum Committee Chair (If Appropriate)) Printed Name Date

University Honors Center (If Appropriate) Printed Name Date

Office of International Education (study tour only) Printed Name Date

ACADEMIC AFFAIRS Printed Name Date

Department, Number, and Title of Course:
 CE 660.02: Civil Engineering Capstone Design

Catalog Description: Second course in a two course capstone design sequence.

Required or Elective: Required

Lecture/Laboratory Schedule: group study in a professional workgroup

Credit Hours (and quarter(s) offered): 3 hour, (Autumn, Winter, Spring)

Prerequisite(s): Sr standing in Civil Engineering. Must be taken as close to graduation as possible.

Textbook(s) and/or Other Required Material: N/A

Course Objectives (and program outcomes addressed):

1. Learn to evaluate designs and create improved designs. (c, e, f, k)
2. Learn to function as a part of a professional team. (c, d, e, f, g, k)
3. Learn to create group reports. (d, g)
4. Learn to make effective oral presentations. (g)

Topics Covered (and approximate time distribution):

This course does not consist of topics. Rather the students work in a group environment with the instructor serving in the role of an outside consultant interacting in a professional manner with the groups.

Distribution of Hours Toward Meeting the Professional Component:

Mathematics:
 Basic Sciences:
 Engineering Topics: 2
 General Education: 1

Relationship of Course to Program Objectives:

Civil Engineering Program Objectives (1-5) Addressed: 1, 2, 4, 5

Relationship of Course to Program Outcomes (a)-(k):

ABET Program Outcomes: c, d, e, f, g, k

Faculty Member Preparing Description: Bill Wolfe **Date:** December 7, 2007

OHIO STATE COURSE CHANGE REQUEST

College **Engineering**

Department **Civil Engineering**
(e.g., Portuguese)

Book 3 Listing: **Civil Engineering**

Proposed Effective Qtr/Yr: SU AU WI SP YEAR: **08**
(See OAA Academic Organization and Curriculum Handbook for Deadlines)

A. Course Offerings Bulletin Information. Follow instructions in the *OAA Academic Organization and Curriculum Handbook*. Before you fill out the "Present Course" information, be sure to check the latest edition of the Course Offerings Bulletin and subsequent Circulating Forms. You may find that the changes you need have already been made or that additional changes are needed.

* If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

COMPLETE ALL ITEMS THIS COLUMN

Present Course

1. Book 3 Listing: **Civil Engineering**
2. Number: **405**
3. Full Title: **Observational analysis**
4. 18-Char. Transcript Title:
5. Level and Credit Hours **U 5**
6. Description: **Theory and application of observational analysis**
(25 words or less)
7. Qtrs. Offered : SU AU WI SP
1st SEM 2nd SEM
8. Distribution of Contact Time: **5 cl**
(e.g., 3 cl, 1 3-hr lab)
A minimum CPHR of 2.0; acceptance
9. Prerequisite(s): **into Civil Engineering major or written permission of department chairperson.**
10. Exclusion:
(Not open to....)
11. Repeatable to a maximum of _____ credits.
12. Off-Campus Field Experience:
13. Cross-listed with:
14. Check the curricular requirement this course fulfills:
BER LAR GEC 3rd writing course
15. Grade option (circle): Ltr S/U P
If P graded, what is the last course in the series?
16. Is an honors version of this course available? Y NX
Is an Embedded Honors version of this course available? Y NX

17. Other general course information:

COMPLETE ONLY THOSE ITEMS THAT CHANGE
Changes Requested

- _____
- _____
- _____
- _____
- U 4**
- _____
- _____
- SU AU WI SP
1st SEM 2nd SEM
- _____
- 4 cl.**
- _____
- Repeatable to a maximum of _____
_____ credits.
- _____
- _____
- Cross listed with: _____
- Check the curricular requirement this course fulfills:
BER LAR GEC 3rd writing course
- Grade option (circle): Ltr S/U P
- Last course in Progress series: _____
Y N


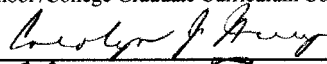

B. General Information:

- 1. Do you want prerequisites enforced electronically? YES NO
(See OAA Academic Organization and Curriculum Handbook for what can be enforced.)
- 2. Does this course currently satisfy any GEC requirement? YES NO
- 3. What other units require this course?
Have these changes been discussed with those units? YES NO
- 4. Have these changes been discussed with academic units that might have a jurisdictional interest in the subject matter?
[Attach relevant letters.] Internal reallocation of hours. YES NO
- 5. Is the request contingent upon other requests? YES NO

List: CE660, 660.01, 660.02, 406

- 6. Purpose of the proposed change. (If the proposed change affects the content of the course, attach a revised syllabus and course objectives.)
(See attached statement.)
- 7. Describe any changes in library, equipment or other teaching aids needed as a result of the proposed change:
None.
- 8. If the proposed change involves budgetary adjustments, describe the method of funding:

APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

	Charles Moore	12/07/07
Academic Unit Undergraduate Studies Committee Chair (Undergrad course)	Printed Name	Date
Academic Unit Graduate Studies Committee Chair((Undergrad/Graduate course)	Printed Name	Date
School /College Undergrad Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
School /College Graduate Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
 12/17/07	Carolyn Merry	12/07/07
ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR	Printed Name	Date
	E. McCann	26 Feb 08
COLLEGE DEAN	Printed Name	Date
Graduate School (If Appropriate)	Printed Name	Date
ASC Curriculum Committee Chair (If Appropriate))	Printed Name	Date
University Honors Center (If Appropriate)	Printed Name	Date
Office of International Education (study tour only)	Printed Name	Date
ACADEMIC AFFAIRS	Printed Name	Date

Department, Number, and Title of Course:

CE 405: Observational Analysis

Catalog Description: Theory and application of observational analysis.**Required or Elective:** Required**Lecture/Laboratory Schedule:** 4 hours lecture**Credit Hours** (and quarter(s) offered): 4 (Autumn and spring)**Prerequisite(s):** Chem 121, En Graph 167, ME 210, Math 254, Physics 133, a second writing course, and Civil Engineering major**Textbook(s) and/or Other Required Material:**CE405 Course Notes – available on line at <http://hcgl.eng.ohio-state.edu/~ceg405>.**Course Objectives** (and program outcomes addressed):

1. Students will be skilled in the mathematics of probability and statistics (a)
2. Students will be skilled at applying these principles to realistic Civil Engineering problems (b, e)
3. Students will be skilled at applying modern computer technology to solving problems (k)
4. Students will be skilled at preparing technical letter reports (g)

Topics Covered (and approximate time distribution):

Jump start for project - Principles of gleaning data from the internet, creating Excel files containing data, use of Excel statistical function to analyze data, and concept of a letter report. (2 week)

Discrete and continuous sample spaces, events, Venn diagrams, intersections and unions, techniques for working word problems (1 week)

Quantifying the probability of an occurrence, quantitative Venn diagrams, prior assumptions and empirical observations, conditional probability, theorem of total probability, and statistical independence. (2 week)

Random variables, probability mass functions, probability density functions, cumulative distribution functions, calculating the probability that a random variable lies between two values. (2 week)

Selected probability distributions – binomial, geometric, Poisson, exponential, normal, logarithmic normal. (2 weeks)

Determining distributions for databases – descriptors for random variables, central tendency, dispersion, skewness, descriptors for the six selected distributions, selecting distributions for particular situations, estimating sample mean and sample variance by method of moments. interval estimation (1 week)

Distribution of Hours Toward Meeting the Professional Component:

Mathematics:	1
Basic Sciences:	0

Engineering Topics: 2

General Education: 1

Relationship of Course to Program Objectives:

Civil Engineering Program Objectives (1-5) Addressed: 1, 4

Environmental Engineering Program Objectives (1-6) Addressed: 1, 4, 6

Relationship of Course to Program Outcomes (a)-(k):

Program Outcomes Addressed: a, b, e, g, k

Faculty Member Preparing Description: Charles Moore

Date: December 7, 2007

OHIO STATE COURSE CHANGE REQUEST

College Engineering

Department Civil Engineering
(e.g., Portuguese)

Book 3 Listing: Civil Engineering

Proposed Effective Qtr/Yr: SU AU WI SP YEAR: 08
(See OAA Academic Organization and Curriculum Handbook for Deadlines)

A. Course Offerings Bulletin Information. Follow instructions in the *OAA Academic Organization and Curriculum Handbook*. Before you fill out the "Present Course" information, be sure to check the latest edition of the Course Offerings Bulletin and subsequent Circulating Forms. You may find that the changes you need have already been made or that additional changes are needed.

* If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

COMPLETE ALL ITEMS THIS COLUMN

Present Course

1. Book 3 Listing: Civil Engineering
2. Number: 406
3. Full Title: Fundamentals of Civil Engineering analysis
4. 18-Char. Transcript Title: _____
5. Level and Credit Hours U 5
6. Description: Application of numerical methods to
problems in Civil Engineering analysis
(25 words or less)
7. Qtrs. Offered : SU AU WI SP
1st SEM 2nd SEM
8. Distribution of Contact Time: 5 cl
(e.g., 3 cl, 1 3-hr lab)
405; minimum CPHR of 2.0; Civil
9. Prerequisite(s) : Engineering major or written
permission of dept. chairperson.
10. Exclusion: _____
(Not open to....)
11. Repeatable to a maximum of _____
credits.
12. Off-Campus Field Experience: _____
13. Cross-listed with: _____
14. Check the curricular requirement this course fulfills:
BER LAR GEC X 3rd writing course X
15. Grade option (circle): Ltr S/U P
If P graded, what is the last course in the series?
16. Is an honors version of this course available? Y NX
Is an Embedded Honors version of this course available? Y NX

17. Other general course information:

COMPLETE ONLY THOSE ITEMS THAT CHANGE

Changes Requested

- _____
- _____
- _____
- _____
- U 4
- _____
- _____
- SU AU WI SP
1st SEM 2nd SEM
- _____
- 4 cl.
- _____
- Repeatable to a maximum of _____
_____ credits.
- _____
- Cross listed with: _____
- Check the curricular requirement this course fulfills:
BER LAR GEC 3rd writing course
- Grade option (circle): Ltr S/U P
- Last course in Progress series: _____
Y N

B. General Information:

1. Do you want prerequisites enforced electronically? YES NO
(See OAA Academic Organization and Curriculum Handbook for what can be enforced.)
2. Does this course currently satisfy any GEC requirement? YES NO
3. What other units require this course?
Have these changes been discussed with those units? YES NO
4. Have these changes been discussed with academic units that might have a jurisdictional interest in the subject matter?
[Attach relevant letters.] Internal reallocation of hours. YES NO
5. Is the request contingent upon other requests? YES NO


List: CE660, 660.01, 660.02, 405

6. Purpose of the proposed change. (If the proposed change affects the content of the course, attach a revised syllabus and course objectives.)
(See attached statement.)

7. Describe any changes in library, equipment or other teaching aids needed as a result of the proposed change:
None.

8. If the proposed change involves budgetary adjustments, describe the method of funding:

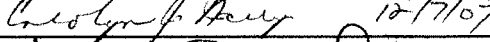
APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

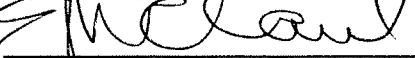
	Charles Moore	12/07/07
Academic Unit Undergraduate Studies Committee Chair (Undergrad course)	Printed Name	Date

Academic Unit Graduate Studies Committee Chair((Undergrad/Graduate course)	Printed Name	Date
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School /College Undergrad Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
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School /College Graduate Curriculum Committee (Undergrad/Grad course)	Printed Name	Date
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 12/17/07	Carolyn Merry	12/07/07
ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR	Printed Name	Date

	E. McCaul	26 Feb 07
COLLEGE DEAN	Printed Name	Date

Graduate School (If Appropriate)	Printed Name	Date
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ASC Curriculum Committee Chair (If Appropriate))	Printed Name	Date
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University Honors Center (If Appropriate)	Printed Name	Date
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Office of International Education (study tour only)	Printed Name	Date
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ACADEMIC AFFAIRS	Printed Name	Date
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Department, Number, and Title of Course:

CE 406: Fundamentals of Civil Engineering Analysis

Catalog Description:

Application of numerical methods to problems in Civil Engineering.

Required or Elective: Required

Lecture/Laboratory Schedule: 4 hours lecture

Credit Hours (and quarter(s) offered): 4 (Winter)

Prerequisite(s): CE405, Civil Engineering major

Textbook(s) and/or Other Required Material: CE 406 Course Notes – available on line at <http://hcgl.eng.ohio-state.edu/~ce406>.

Course Objectives (and program outcomes addressed):

1. Students will be skilled in use of modern computers and software to solve a variety of engineering problems. (a, c, e, h, k)
2. Students will understand the similarities between seemingly diverse engineering situations. (a, c, e, k)
3. Students will be skilled in developing application-specific computer software. (g, k)
4. Students will be skilled in developing effective user interfaces. (g, k)

Topics Covered (and approximate time distribution):

Solution of nonlinear algebraic equations – method of halving the interval, Newton-Raphson method, $x = g(x)$ iteration, and Q-D algorithm. (1 week)

Solving systems of simultaneous linear equations by matrix elimination – Gaussian elimination, solving systems, inverting matrices, evaluating determinants. (1 week)

Solving simultaneous linear equations by matrix iteration – LU decomposition, the Jacobi method. (1 week)

Applications of linear systems – statically determinate and indeterminate trusses, mixed reactors, aggregate proportioning, and concrete mix design. (2 weeks)

Solving systems on nonlinear simultaneous equations – Newton-Raphson solutions, the Jacobian, and solution of pipe networks. (1 week)

Homogeneous systems of equations – eigenvalues and eigenvectors, applications to lumped masses and springs, principal stresses, stability of mixed reactors, and buckling of columns. (1 week)

Method of weighted residuals – approximating functions and residuals, weighted residuals, overdetermined systems of linear equations (method of weighted residuals), least squares fit to linear data sets, least squares fits to nonlinear data sets, weighted least squares fits to data sets, combining equations from theory with observed data, weighted least squares approaches to combining observations and theory. (1 week)

Introduction to finite element analysis – discretization, weighted residuals, Galerkin’s method, assemblage of elements, application to heat transport. (1/2 week)

Finite differences – algorithms for derivatives, boundary conditions, application to ordinary differential equations, application to partial differential equations, application to the Laplace equation (seepage), application to the heat equation (1/2 week)

Digital filters – data smoothing, edge detection, least squares Laplace filter, application to image processing. (1/2 week)

Numerical integration – Euler’s method, Simpson’s rules. (1/2 week)

Distribution of Hours Toward Meeting the Professional Component:

Mathematics:	1
Basic Sciences:	
Engineering Topics:	2
General Education:	1

Relationship of Course to Program Objectives:

Civil Engineering Program Objectives (1-5) Addressed:	1, 2, 4, 5
Environmental Engineering Program Objectives (1-6) Addressed:	1, 2, 4, 5, 6

Relationship of Course to Program Outcomes (a)-(k):

Program Outcomes Addressed: a, c, e, g, k.

Faculty Member Preparing Description: Charles Moore

Date: December 7, 2007

Civil Engineering Sample Curriculum* - 2007-2008

Name: _____ E-mail: _____ 20
@osu.edu

YEAR	AUTUMN	WINTER	SPRING
1	Math 151 (Calc. & Analytic Geom.).. 5 _____ Engineering 181 (Intro. to Eng. I). 3 _____ Engineering 100.04 (Eng. Survey) 1 _____ GEC 5 _____	Math 152 (Calc. & Analytic Geom.) ..5 _____ Engineering 183 (Intro. Eng. II)....3 _____ Physics 131 (Particles & Motion)....5 _____ GEC.....5 _____	Math 153 (Calc. & Analytic Geom.).. 5 _____ Physics 132 (Elec. & Magnetism) .. 5 _____ Chem. 121 (General Chemistry) 5 _____ English 110 (1 st yr. English Comp.) 5 _____
2	Math 254 (Calc. & Analytic Geom.).. 5 _____ Physics 133 (Electrdynm. & Quant.) 5 _____ <i>ME 410 (Statics)..... 4 _____</i> GEC.....5 _____	EG 167 (Prob. Solv. Prog. Eng.)4 _____ Or CSE 202 (Intro. to Prog./Algo. for Eng./Sci.) <i>ME 420 (Strength of Materials).....4 _____</i> Chem. 122 (General Chemistry).....5 _____ Or Chem. 125 (Chem. for Engrs.)..4 _____ GEC.....5 _____	<i>CE 405 (Observational Analysis)..... 5 _____</i> <i>ME 430 (Dynamics) 4 _____</i> <i>CE 460 (Prof. Aspects of CEE)..... 1 _____</i> <i>CE 400.01 (Intro to Surveying)..... 2 _____</i> <i>CE 400.03 (Data Tech. for CE).....2 _____</i>
3	<i>CE 413 (Fluid Mechanics)..... 4 _____</i> <i>CE 451 (CE Materials)..... 4 _____</i> <i>CE 540 (CE Systems) 4 _____</i> <i>CE 431 (Structural Engineering Prin.) 3 _____</i>	<i>CE 406 (Fund. of CE Analysis)5 _____</i> <i>CE 570 (Trans. Eng. & Analysis)....4 _____</i> <i>CE 576 (CE Econ. & Planning)4 _____</i> <i>CE 516 (Water Resources Eng.)4 _____</i>	<i>CE 520 (Dsgn. of Trtmt. Facilities) 4 _____</i> <i>CE 535 (Bsc. Reinf. Concrete Dsgn.) 5 _____</i> <i>CE 554 (Geotechnical Engineering) 4 _____</i> Math 255 (Diff. Eq. & their Apps.)...5 _____ Or Math 415 (Ord. & Part. Diff. Eq.) 4 _____
4	<i>ME 500 (Engineering Thermal Sci.).. 4 _____</i> <i>Technical Elective..... ~4 _____</i> <i>Technical Elective..... ~4 _____</i> GEC.....5 _____	<i>EE 300 (Electrical Circuits)3 _____</i> <i>Technical Elective..... ~4 _____</i> <i>Technical Elective..... ~4 _____</i> GEC.....5 _____	<i>Technical Elective..... ~4 _____</i> <i>Technical Elective..... ~4 _____</i> <i>Technical Elective..... ~4 _____</i>

Courses **Bolded** are offered once a year. Courses in *italics* are Monitored courses in which you must maintain a cumulative point hour-ratio of 2.0. CE 400.01 and 400.03 must be taken together. CE 405, 400.01 & 400.03, 431, and 535 are offered twice a year. Please check the on-line course offerings for pre-requisite requirements and availability of other courses.

GENERAL EDUCATION (35 hours)

English & Communication Skills (10 hrs)

English 110.xx (5) _____
2nd Writing Course (5) _____

Students must take 25 hours across Social Sciences, Historical Study, and Arts & Humanities with a minimum of 5 hours and maximum of 10 hours per category.

Social Sciences (5-10 hours)

Economics 200 (Required) () _____
_____ () _____

Historical Study (5-10 hours)

_____ () _____
_____ () _____

Arts & Humanities (5-10 hours)

_____ () _____
_____ () _____

Ethics (5)

(May overlap with another GEC category)

_____ () _____

Social Diversity

(May overlap with another GEC category)

_____ () _____

Technical Electives (28 hours)

_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____
_____ () _____

Technical Writing (14 hours)

(Counted in Civil core)

CE 405 (5) _____
CE 406 (5) _____
CE 660 or 619 (Env.) (4) _____

Hours Required:

Pre-Civil..... 54
Civil Core..... 78-80
General Education..... 35
Technical Electives..... 28

TOTAL HOURS 195-197

Admission to the Civil and Environmental Engineering program requires a minimum cumulative point-hour ratio (CPHR) of 2.0 as well as a minimum secondary point-hour ratio (SPHR) of 2.0 in the following pre-major courses: *Math 151, 152, 153, 254; Physics 131, 132, 133; ME 410; Chemistry 121; Engineering 181, 183 & EG 167.* English 110.xx and ENG 100.04 must also be completed. Formal application is required.

Students are accepted into the major spring and autumn quarters only. Applications to Major are available at <http://www.ceegs.ohio-state.edu/CEUNDERGRAD/forms.php>. Applications are due in winter/spring for spring/autumn entry. Contact the Undergraduate Advisor (HI 475) if you have any questions.

The Ohio State University College of Engineering General Education Curriculum (GEC) Courses

21

ENGLISH & COMMUNICATION SKILLS (10 hrs)

- A. First Course (5 hrs)**
English 110.xx
- B. Second Course (5 hrs)**
African-American and African Studies 367.02, 367.03, 367.04
Agricultural Communication 367
Arabic 367
Art Education 367.01, 367.02, 367.03
Communication 367
Comparative Studies 367.01, 367.02, 367.03, 367.04
Dance H367.01
Economics 367.01, 367.02
Engineering 367
English 367.01, 367.02, 367.03, 367.04, 367.05, 367.06, 367.07
German 367
Human Development and Family Science 367
Landscape Architecture 367
Linguistics 367
Modern Greek 367
Natural Resources 367
Nursing 367
Philosophy 367
Physics 367
Political Science 367.01
Psychology 367.01, 367.02
Slavic Languages and Literatures 367
Sociology H367.01, 367.02, H367.03
Spanish 367
Theater 367.01, 367.02, 367.03
Women's Studies 367.01, 367.02, 367.03, 367.04
Yiddish 367

C. Third Course (Major Department)

- Aeronautical and Astronautical Engineering 510.01, 510.02 AND 510.03 (all three must be taken)
Aviation 530, 540, 550
Chemical & Biomolecular Engineering 521, 630, 760, 762, AND 764 (all five must be taken)
Civil Engineering 405, 406, 460, AND 619 (all four must be taken)
Computer Science & Engineering 560
Electrical & Computer Engineering 582
Engineering Physics – Physics 596
FAB Engineering 225, 695, 723, 724, AND 725 (all five must be taken)
Geodetic Science 625
Industrial and Systems Engineering 500, 608.01, AND 608.02 (all three must be taken)
Materials Science and Engineering 581.01, 581.02, 581.03, 695.01, AND 695.02, 695.03 (all six must be taken)
Mechanical Engineering 564, 570, AND 581 (all three must be taken)
Welding Engineering 690, 691, 692, AND MSE 581.02 (all four must be taken)

ETHICS (5 hrs selected from either Ethics Group I or II.)**A. Ethics Group I (Counts as any Social Science Course)**

- Economics 348
Sociology 302

B. Ethics Group II (Counts as any Arts & Humanities Course)

- Philosophy xxx (see your advisor for the call number)
Comparative Studies 272¹

Students must take 25 hours across Social Sciences, Historical Study, and Arts & Humanities with a minimum of 5 hours and maximum of 10 hours per category.**SOCIAL SCIENCES** (5-10 hours, no more than one from a group)**A. Individuals and Groups**

- African-American & African Studies 201, 218
Animal Science 240
Anthropology 201, 202, 421.08
Communication 101, 200, 431
Economics 348
Education 411
Human Development and Family Science 360, 361, 364
International Studies 356
Linguistics 170, 270, 372, 371, 375
Political Science 201
Psychology 100², 367.01, 367.02, 371
Rural Sociology 378
Social Work 230
Sociology 210, 370, 380
Speech and Hearing Science 330, 350
Textiles and Clothing 372
Women's Studies 110

B. Organizations and Politics

- Economics 201, 367.01, 367.02
Family Resource Management 243
Geography 450, 460, 643

- International Studies 201, 230, 231, 235, 245, 250
Natural Resources 400
Political Science 100, 101, 165, 210, 245, 367.01
Rural Sociology 105
Sociology 101, 345, H367.01, 367.02, H367.03

C. Human, Natural, & Economic Resources

- Agricultural, Environmental, and Development Economics 200, 280
Economics 110, 200
Family Resource Management 340
Geography 200, 240, H410, 430, History 366.01
International Studies 210, 215, 240, 280
Political Science 145
Sociology 463, 466

HISTORICAL STUDY (5-10 hrs)

- African-American & African Studies 121,122
Economics 515,516
History 111,112, 121,122, 141,142, 151,152, 171,172, 181,182
Philosophy H111, H112

ARTS & HUMANITIES (5-10 hrs, no more than one from a group)**A. Literature**

- African-American and African Studies 154, 251, 254, 271, 345, 367.02, 367.03, 367.04, 551
Arabic 371, 372
Chinese 251, 501, 502, 503, 504
Classics 101, 102, 222
Comparative Studies 100, 201, 202.01, 202.02, 203, 204, 205, H240, 273, 301, 306, 308, 314
English 201, 202, 220, 260, 261, 262, 275, 280, 281, 290, 291, 367.02, 367.03
French 150, 151, 152, 250
German 250, 260.01, 260.02, 260.03, H263, 291, 292, 399
Hebrew 370, 372, 373, 374, 378
Italian 151, 152, 251
Japanese 251, 252
Korean 251
Modern Greek 371
Near Eastern Languages & Cultures 271, 371, 372, 374
Persian 370, 371
Philosophy 215, 301, 302, 303, 304, 305, 306, 307
Russian 250, 251
Scandinavian 222
Slavic Languages and Literatures 245
Spanish 320, 321, 520
Theatre 367.02
Turkish 371, 372
Women's Studies 215, 367.01, 367.02, 367.03, 367.04, 372
Yiddish 371, 399

B. Visual/Performing Arts

- Architecture 271³
Art 205, 206, 300.01, 300.02, 340, H455
Art Education 160, 252, 255, 367.01
Comparative Studies 358
Dance 161, 200
East Asian Languages & Literatures 346
English 263, 269
Film Studies 270
History of Art 210, 211, 212, 213, 216, 260, 300, 301, 305, 315, 316, 340, 345, 350, 360, 505,519, 520, 525, 530, 576, 582
Italian 221
Korean 505
Landscape Architecture 201
Medieval & Renaissance Studies 219
Modern Greek 268
Music 250, 251, 252, 253, 288, 341, 342, 345.01, 347, 348, 349
Philosophy 240, H242
Physics H455
Russian 360
Scandinavian 520
Spanish 322, 330, 380
Theater 100, H101, 161, H230, 271, 280³
Women's Studies 317, 230

C. Cultures and Ideas

- African-American and African Studies 303, 342, 485.01
Allied Medicine 307
Anthropology 241
Arabic 241, 367, 377
Arts and Sciences 500
Chinese 231, 232
Classics 224, 225, 226, 230, 240, 250

- Comparative Studies 234, 241, 242, 264, 270, 272, 274, 275, 305, 315, 335, 336, 339, 345, 367.01, 367.02, 367.03, 376, 377

Dance, 357

- East Asian Languages & Literatures 131, 341
English H167, 264, 270, 271, 276, 277
French 153
German 275, 299
Hebrew 216, 241, 376, 379
History 306, 330.01, 346
History of Art 240
Japanese 231
Jewish Studies 201
Korean 231
Landscape Architecture 367
Linguistics 201, 301, 303
Medieval and Renaissance Studies 210,211 212, 213, 214, 215, 216, 217, 218, 226, 240
Modern Greek 241
Natural Resources 367
Near Eastern Languages and Cultures 241, 244, 311, 314, 341, 344, 345, 351, 360, 370, 379
Persian 241
Philosophy 101, 130, 230, 270, 336
Portuguese 330
Romanian 235
Russian 135, 235
Slavic Languages and Literatures 130
Spanish 150, 151, 331
Turkish 241
Women's Studies 101
Yiddish 241, 367

DIVERSITY EXPERIENCE (Must include one

"diversity experience" course which may be taken from any GEC category. Underlined courses in all categories meet "diversity experience" requirements.)

- African-American & African Studies 230, 243

Biology 597**Comparative Studies 243****Economics 482****Family Resource Management 362****Geography 400****History 325****Political Science 508****Psychology 375, 646****Social Work 300, 301****Sociology 306, 382, 435, 467, 608****Speech and Hearing 310****Women's Studies 370, 510, 520****FOREIGN LANGUAGE** (Waived)

A. Completion through enrollment in a foreign language sequence through 104, or enrollment in a foreign language course with a prerequisite of 104 can be substituted for one GEC course requirement in the Arts and Humanities category, group C.

B. Completion of a foreign language minor can be substituted for two GEC courses, one in Social Sciences category, group A or B, and one in Arts & Humanities category, group A or C.

UNIVERSITY CAPSTONE (Waived – A Social Science 597 may be substituted for a 5 hr Social Science, group A, B, or C; A 5 hr Arts & Humanities 597 may be substituted for a 5 hr Arts & Humanities group B course.)

Social Sciences

- Anthropology 597.01, 597.02, H597.03, 597.04
Evolution, Ecology, and Organismal Biology 597.02
Geography 597.01, 597.02
International Studies 597.01, 597.02
Political Science 597.01, 597.02
Sociology 597.01, 597.02

Arts & Humanities

- Comparative Studies 597.01, 597.02
History 597

¹Comparative Studies 272 can only count as a Culture and Ideas course within the Arts & Humanities Category.

²Psychology 100 is not approved for social diversity when it comes in as a transfer credit.

³Note that this is a three credit hour course and by itself does not meet the minimum credit-hour requirement for the VPA section.

Underlined courses indicate "social diversity" GEC must include one "social diversity" course.