



Curriculum and Course Change System - Print Major Form


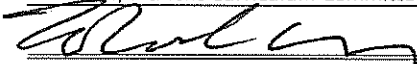
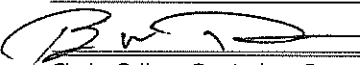

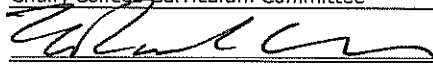

000024

Add Major Name: International Engineering and Science Certificate**Degree:** CERT**Effective Catalog Year:** 2012

Explanation: Our goal is to enhance the international and linguistic experience of Engineering and Science Majors at Clemson, improve contact between Clemson and the international community of the upstate and beyond, and inaugurate an innovative program in International Engineering that should receive nationwide recognition. Additionally, this program would give students an opportunity to work abroad for a multinational employer, who then would be able to evaluate the student for permanent employment. Though we propose to begin the program with a French track, we envision additional lines in other languages (such as German, Chinese, etc.) as resources become available. Funding from multinational companies would help launch the program by providing scholarship and internship opportunities and help make it sustainable over the long term. By providing incentives, student recruiting could begin in high school, where students who engage early in a foreign language would be tracked to enter this program at an advanced stage. This would stimulate students to attend Clemson, choose an engineering or science major, and gain the attributes needed by industry to work in for a multinational company or in an international setting.

The Certificate Program in International Engineering and Science is designed to produce technically, culturally, and linguistically competent engineers and scientists for the international employment market. The program will include a set of coursework and an international study abroad or internship experience, and should create a favorable path to post-degree employment. To document their completion of the program, participating students will receive a Certificate in International Engineering and Science.

Form Originator: EBRAD, Elizabeth Gbisch **Date Form Created:** 3/13/2012**Form Last Updated by:** , **Date Form Last Updated:** 3/13/2012**Form Number:** 4953**Approval**

			4/6/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum Committee	Date
	3/20/12		
Department Chair	Date	Chair, Graduate Curriculum Committee	Date
	3/27/12		6/11/12
Chair, College Curriculum Committee	Date	Provost	Date
	3/20/12		6/11/12
College Dean	Date	President	Date

International Engineering and Science Proposed Certificate Program

Introduction and Motivation: Our goal is to enhance the international and linguistic experience of Engineering and Science Majors at Clemson, improve contact between Clemson and the international community of the upstate and beyond, and inaugurate an innovative program in International Engineering that should receive nationwide recognition. Additionally, this program would give students an opportunity to work abroad for a multinational employer, who then would be able to evaluate the student for permanent employment. Though we propose to begin the program with a French track, we envision additional lines in other languages (such as German, Chinese, etc.) as resources become available. Funding from multinational companies would help launch the program by providing scholarship and internship opportunities and help make it sustainable over the long term. By providing incentives, student recruiting could begin in high school, where students who engage early in a foreign language would be tracked to enter this program at an advanced stage. This would stimulate students to attend Clemson, choose an engineering or science major, and gain the attributes needed by industry to work in for a multinational company or in an international setting.

The Certificate Program in International Engineering and Science is designed to produce technically, culturally, and linguistically competent engineers and scientists for the international employment market. The program will include a set of coursework and an international study abroad or internship experience, and should create to a favorable path to post-degree employment. To document their completion of the program, participating students will receive a Certificate in International Engineering and Science.

The Certificate can be completed with less requirements than a minor. Students earning the Certificate can complete the additional requirements and earn a Minor. The Minor is listed on the student's transcript. Requirements for the completion of the proposed certificate program include:

1. Completion of credits through the 202 level of a second language (fourth semester, e.g., FR 202).
2. An additional course chosen in conversational language in the second language (e.g., FR 305) before commencing a study abroad or international internship.
3. One minimum three-month study or work abroad experience consisting of course work, internship or research. Opportunities for study abroad can be provided through the Global E3 Consortium and through other direct enrollment programs like the ENSEA FAME program in Electrical Engineering. Internships abroad will be provided in part by international business partners. For example, these could include Michelin, Schneider Electric and Schlumberger. The internship could be a culmination of a series of co-operative education work assignments in the US.
4. The completion of degree requirements for a College of Engineering and Science baccalaureate program.

Enrollment and completion:

Students will apply for the certificate program through an online request form. Decisions on credit equivalencies will be made by the IES coordinator in consultation with the student's major engineering or science department. The IES coordinator and the student's academic advisor will work in consultation to advise the student in study abroad or international internship matters. They will also work in consultation to affirm the completion of the requirements for the IES certificate or minor.

The students completing this program will be among the best Engineers and Scientists produced at Clemson; they will also be highly competent in a foreign language and culture. They will therefore be excellent candidates for career placement in international positions or multinational companies.

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Proposed
**International Engineering and
 Science Certificate**

- Foreign Language through the 202-Level (e.g., French shown)

FR 101

FR 102

FR 201

FR 202

- International Experience:

- Study Abroad Program (transfer back to Clemson at least 9 credits)

or

- International Internship (minimum 3 months)

- Foreign Language Conversation (e.g., French shown)

FR 305

Existing
**International Engineering and
 Science Minor**

- Foreign Language through the 202-Level

FR 101

FR 102

FR 201

FR 202

- International Experience:

- Study Abroad Program (transfer back to Clemson at least 9 of *Engineering* and/or *Science* credits)

or

- International Internship (minimum 3 months)

plus

3 courses (9 credits) from this list:
 300-level or higher foreign language courses; ECON 310, 412, 413; and PO SC 361, 362, 371, 375, 472, 477, 478.

Note: Many 300- and 400-level to choose from, including FR 305 for example. On this list in French:

FR 305: *French Conversation and Composition*

FR 307: *French Civilization*

FR 316: *French for Int'l Trade I*

FR 317: *Contemporary French Civilization*

FR 416: *French for Int'l Trade II*

FR 3XX: *French for Engineers and Scientists (technical French)* – could be developed.

000031

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Curriculum and Course Change System - Print Change/Delete**Course Form****X Change a Course - Abbrev & Number: C E- 447**

Corresponding Lab Course: --

Corresponding Honors course: --

.. Add Honors course: --

Corresponding Graduate course: C E- -647

.. Add Graduate course: --**Course Title: STORMWATER MANAGEMNT****Brief Statement of Change:**

Change the prerequisite of the course to include EE&S 202.

Last Term taught: 1108

.. Change Abbrev to:

Effective Term: 05/2012

.. Change Number to:**.. Change Catalog Title:****.. Change Transcript Title:**

from:

from: STORMWATER MANAGEMNT

to:

to:

.. From: Fixed Credit: 3 (3,) To: Fixed Credit: (,)**Change of Credit** Variable Credit: - (-), (-) Variable Credit: - (-),(-)**.. Add cross-listing with the following child course(s):****.. Delete cross-listing with the following child course(s):****.. Reverse Parent/Child relationship with:****.. Change Method
of Instruction****.. Change Course
Modifier****.. Change General Education
Designation**

from:

from:

from:

to:

to:

to:

X A-Lecture Only

.. Pass/Fail Only

.. English Composition

..

..

X Graded

.. Oral Communication

..

..

.. Variable Title

.. Mathematics

..

.. B-Lab (w/fee)

.. Creative Inquiry

.. Natural Science w/Lab

..

..

.. Repeatable

.. Math or Science

..

.. D-Seminar

maximum credits

.. A&H (Literature)

..

..

from:

.. A&H (Non-Literature)

..

.. E-Independent Study

to:

.. Social Science

..

..

to:

.. CCA

..

.. F-Tutorial (w/fee)

.. STS

..

..

.. G-Studio

..

.. H-Field course

..

.. I-Study Abroad

..

.. L-Lab (no/fee)

..

.. N/B-Lecture/Lab(w/fee)

..

.. N/L-Lecture/Lab(no fee)

..

.. Change Catalog Description:**from:****to:**

000032

X Change Prerequisite(s):**from:** Prereq: CE 342; Coreq: EE&S 401 or consent of instructor.**to:** Prereq: CE 342; Coreq: EE&S 202 or EE&S 401; or consent of instructor.**Learning Objectives:** The main objective of this course is to introduce students to storm water management methods and procedures.

Topical Outline: 1. Methods for peak discharge calculations (urban and rural) (4 hours)
 2. Highway drainage systems: culverts, inlets, and junctions (8 hours)
 3. Stormwater quality: event concentrations, non-point sources, loadings, and runoff quality (6 hours)
 4. Receiving water quality: evaluation and modeling (6 hours)
 5. Stormwater management alternatives and best management practices (6 hours)
 6. Detention and retention ponds (6 hours)
 7. Erosion and sediment control (5 hours)
 8. Hour-tests (2 hours)

Evaluation: Homework - 7%

In-class questions - 8%

Lab work - 15%

Tests - 45%

Final Exam - 25%

Duplication (if applicable): n/a**Add course requirements for honors and/or 600-level courses (if applicable):**

Homework - 7%

In-class questions - 8%


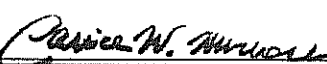
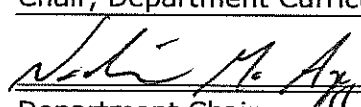
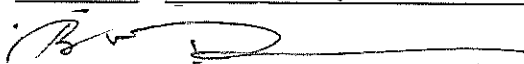
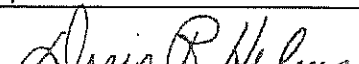
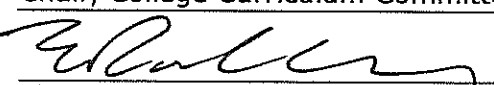
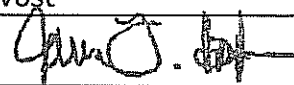
Lab work - 15%

Tests - 36%

Final Exam - 24%

Project - 10%

Learning Activities associated with General Education competencies (if applicable): n/a**Form Originator:** KRISTI, Kristin Baker **Date Form Created:** 3/5/2012**Form Last Updated by:** KRISTI, Kristin Baker **Date Form Last Updated:** 3/5/2012**Form Number:** 4937**Approval**

	3/5/2012	 4/6/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum
	3/6/2012	
Department Chair	Date	Chair, Graduate Curriculum Committee
	3/19/12	 6/11/12
Chair, College Curriculum Committee	Date	Provost
	3/20/12	 6/11/12
College Dean	Date	President
Director, Calhoun Honors College	Date	

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Curriculum and Course Change System - Print Change/Delete**Course Form****X Change a Course - Abbrev & Number: C E- 482**

Corresponding Lab Course: --

Corresponding Honors course: --

.. Add Honors course: --

Corresponding Graduate course: C E- -682

.. Add Graduate course: --**Course Title: GRNDWATER & CONTAM****Brief Statement of Change:**

Change the corequisite of the course to include EE&S 202.

Last Term taught: 1108

.. Change Abbrev to:

Effective Term: 05/2012

.. Change Number to:**.. Change Catalog Title:****.. Change Transcript Title:**

from:

from: GRNDWATER & CONTAM

to:

to:

.. From: Fixed Credit: 3 (3,) To: Fixed Credit: (,)**Change of Credit** Variable Credit: - (-), (-) Variable Credit: - (-),(-)**.. Add cross-listing with the following child course(s):****.. Delete cross-listing with the following child course(s):****.. Reverse Parent/Child relationship with:****.. Change Method
of Instruction****.. Change Course
Modifier****.. Change General Education
Designation**

from:

from:

from:

to:

to:

to:

X A-Lecture Only

.. Pass/Fail Only

.. English Composition

..

..

X Graded

.. Oral Communication

..

.. B-Lab (w/fee)

.. Variable Title

.. Mathematics

..

..

.. Creative Inquiry

.. Natural Science w/Lab

..

.. D-Seminar

.. Repeatable

.. Math or Science

..

..

maximum credits

.. A&H (Literature)

..

.. E-Independent Study

from:

.. A&H (Non-Literature)

..

..

to:

.. Social Science

..

.. F-Tutorial (w/fee)

.. CCA

..

..

.. STS

..

.. G-Studio

..

.. H-Field course

..

.. I-Study Abroad

..

.. L-Lab (no/fee)

..

.. N/B-Lecture/Lab(w/fee)

..

.. N/L-Lecture/Lab(no fee)

..






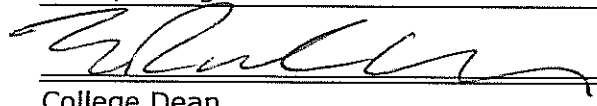
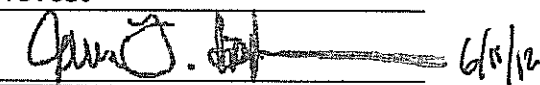
.. Change Catalog Description:

from:

to:

000034

X Change Prerequisite(s):**from:** Prereq: CE 341; Coreq: EE&S 401.**to:** Prereq: CE 341, Coreq: EE&S 202 or EE&S 401 or consent of instructor.**Learning Objectives:** To introduce students to the basic concepts in hydrogeology and contaminant transport. To understand the scope and approaches used in groundwater resource, contamination, and remediation studies. To consider some of the techniques used in quantifying groundwater resource and contamination problems.**Topical Outline:** 1.Principles of groundwater flow (5 hours)
2.Saturated and unsaturated flow (6 hours)
3.Flow nets and well hydraulics (7 hours)
4.Groundwater resources, pumping (6 hours)
5.Contaminant transport process (6 hours)
6.Contaminant transport modeling (7 hours)
7.Groundwater remediation (5 hours)
8. Tests (3 hours)**Evaluation:** Tests: 40%
Homework and Quizzes - 35%
Final Exam - 25%**Duplication (if applicable):** n/a**Add course requirements for honors and/or 600-level courses (if applicable):** Tests: 40%
Homework and Quizzes - 35%
Final Exam - 25%**Learning Activities associated with General Education competencies (if applicable):** n/a**Form Originator:** KRISTI, Kristin Baker **Date Form Created:** 3/5/2012**Form Last Updated by:** KRISTI, Kristin Baker **Date Form Last Updated:** 3/5/2012**Form Number:** 4938**Approval**

	3/5/2012	 4/6/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum
	3/6/2012	
Department Chair	Date	Chair, Graduate Curriculum Committee
	3/27/2012	 6/11/12
Chair, College Curriculum Committee	Date	Provost
	3/19/12	 6/15/12
College Dean	Date	President
Director, Calhoun Honors College	Date	



Curriculum and Course Change System - Print Change/Delete Course Form

000035

X Change a Course - Abbrev & Number: CH- 403

Corresponding Lab Course: --

Corresponding Honors course: CH-H-403

.. Add Honors course: --

Corresponding Graduate course: ~~CH-683~~

.. Add Graduate course: --

Course Title: ADV SYNTH TECH

Brief Statement of Change:

CH 205 replaces CH 402 - content from CH 205 (Introduction to Inorganic Chemistry) is adequate preparation for this course. CH 402 also is same semester as CH 403, so it cannot be a prerequisite (typo). Adding CH 315 as prerequisite - in addition to doing organic/inorganic syntheses, students are performing quantitative analyses on compounds & solutions, and the preparation of solutions with precise concentrations as well as use of analytical instruments taught in CH 315 is essential for CH 403. All students who took CH 403 in Term 1108 had already taken CH 315, and it is listed one year earlier than CH 403 in the curriculum map. CH 317 would also count instead of CH 315.

Last Term taught: 1108

.. Change Abbrev to:

Effective Term: 08/2012

.. Change Number to:

.. Change Catalog Title:

.. Change Transcript Title:

from:

from: ADV SYNTH TECH

to:

to:

.. From: Fixed Credit: 2 (0,)

To: Fixed Credit: (,)

Change of Credit Variable Credit: - (-), (-) Variable Credit: - (-),(-)

.. Add cross-listing with the following child course(s):

.. Delete cross-listing with the following child course(s):

.. Reverse Parent/Child relationship with:

.. Change Method of Instruction

.. Change Course Modifier

.. Change General Education Designation

from:

to:

from:

to:

.. A-Lecture Only

.. Pass/Fail Only

..

.. English Composition

..

X B-Lab (w/fee)

.. X Graded

..

.. Oral Communication

..

.. D-Seminar

.. Variable Title

..

.. Mathematics

..

.. E-Independent Study

.. Creative Inquiry

..

.. Natural Science w/Lab

..

.. F-Tutorial (w/fee)

.. Repeatable

..

.. Math or Science

..

.. G-Studio

.. maximum credits

..

.. A&H (Literature)

..

.. H-Field course

.. from:

..

.. A&H (Non-Literature)

..

.. I-Study Abroad

.. to:

..

.. Social Science

..

.. L-Lab (no/fee)

..

..

.. CCA

..

.. N/B-Lecture/Lab(w/fee)

..

..

.. STS

..

.. N/L-Lecture/Lab(no fee)

..

..

.. Change Catalog Description:

from:

to:

X Change Prerequisite(s):

from: CH 227, 228, 402 or permission of instructor.

to: CH 205, 227, 228, 315/317 or permission of instructor

Learning Objectives:

Topical Outline:


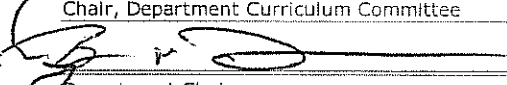

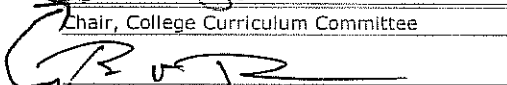

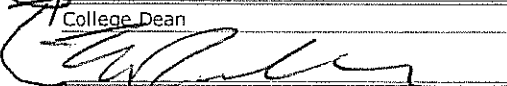
Evaluation:

Form Originator: ATENNYS, Andrew Tennyson Date Form Created: 2/6/2012

Form Last Updated by: , Date Form Last Updated: 2/8/2012

Form Number: 4865

Approval

Chair, Department Curriculum Committee	Date		4/6/2012
Department Chair	Date	Chair, Graduate Curriculum Committee	Date
	2/10/2012		6/11/12
Chair, College Curriculum Committee	Date	Provost	Date
	3-27-12		6/11/12
College Dean	Date	President	Date
	3/19/12		
Director, Calhoun Honors College	Date		



Curriculum and Course Change System - Print Change/Delete Course Form

000038

X Change a Course - Abbrev & Number: E G- 208

Corresponding Lab Course: E G-L-208

Corresponding Honors course: E G-H-208

.. Add Honors course: --

Corresponding Graduate course: --

.. Add Graduate course: --

Course Title: ENGR GR & DESIGN

Brief Statement of Change:

Removing the co-req for non-honors E G 208. Leaving co-reqs for E G H 208.

Approximately 20% of students taking course are not engineering majors so current co-req is not required for those students and allows more scheduling flexibility for transfer and "off track" engineering students.

Last Term taught: 1108

.. Change Abbrev to:

Effective Term: 01/2012

.. Change Number to:

.. Change Catalog Title:

.. Change Transcript Title:

from:

from: ENGR GR & DESIGN

to:

to:

.. From: Fixed Credit: 2 (1,2) To: Fixed Credit: (,)

Change of Credit Variable Credit: - (-), (-) Variable Credit: - (-), (-)

.. Add cross-listing with the following child course(s):

.. Delete cross-listing with the following child course(s):

.. Reverse Parent/Child relationship with:

.. Change Method of Instruction

.. Change Course Modifier

.. Change General Education Designation

from:

to:

.. Pass/Fail Only

from:

to:

.. English Composition

.. A-Lecture Only

.. X Graded

..

.. Oral Communication

.. B-Lab (w/fee)

.. Variable Title

..

.. Mathematics

.. D-Seminar

.. Creative Inquiry

..

.. Natural Science w/Lab

.. E-Independent Study

.. Repeatable

..

.. Math or Science

.. F-Tutorial (w/fee)

.. maximum credits

..

.. A&H (Literature)

.. G-Studio

.. from:

..

.. A&H (Non-Literature)

.. H-Field course

.. to:

..

.. Social Science

.. I-Study Abroad

..

..

.. CCA

.. L-Lab (no/fee)

..

..

.. STS

X N/B-Lecture/Lab(w/fee)

.. N/L-Lecture/Lab(no fee)

.. Change Catalog Description:

from:

to:

X Change Prerequisite(s):

from: Co-req ENGR 141; for honors students, MTHSC 108

to: for honors students co-req of ENGR 141 and MTHSC 108

Learning Objectives:

Topical Outline:


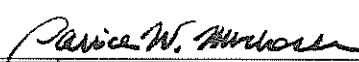
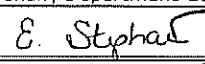
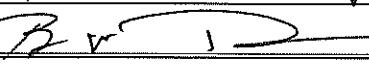
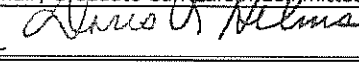
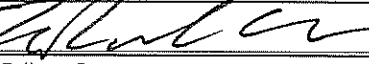

Evaluation:

Form Originator: JMINOR, John Minor Date Form Created: 11/3/2011

Form Last Updated by: JMINOR, John Minor Date Form Last Updated: 11/3/2011

Form Number: 4643

Approval

	3/7/12		4/6/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum Committee	Date
	3/10/12		
Department Chair	Date	Chair, Graduate Curriculum Committee	Date
	3/27/2012		6/11/12
Chair, College Curriculum Committee	Date	Provost	Date
	3/20/12		6/11/12
College Dean	Date	President	Date
Director, Calhoun Honors College	Date		

000037



Curriculum and Course Change System - Print Change/Delete Course Form

X Change a Course - Abbrev & Number: E G- 210

Corresponding Lab Course: E G-L-210

Corresponding Honors course: E G-H-210

.. Add Honors course: --

Corresponding Graduate course: --

.. Add Graduate course: --

Course Title: CAD & ENGR APP

Brief Statement of Change:

Remove Co-requisites from course. This change will allow more flexibility in scheduling for transfer and "off-track" students.

Last Term taught: 1201

.. Change Abbrev to:

Effective Term: 05/2012

.. Change Number to:

.. Change Catalog Title:

.. Change Transcript Title:

from:

from: CAD & ENGR APP

to:

to:

.. From: Fixed Credit: 2 (1,2) To: Fixed Credit: (,)

Change of Credit Variable Credit: - (-), (-) Variable Credit: - (-),(-)

.. Add cross-listing with the following child course(s):

.. Delete cross-listing with the following child course(s):

.. Reverse Parent/Child relationship with:

.. Change Method of Instruction	X Change Course Modifier	.. Change General Education Designation
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from:	to:	from:	to:	from:	to:
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.. A-Lecture Only Pass/Fail Only English Composition	..	
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.. B-Lab (w/fee)	.. X Graded	X	.. Oral Communication	..	
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.. D-Seminar Variable Title Mathematics	..	
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.. E-Independent Study Creative Inquiry Natural Science w/Lab	..	
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.. F-Tutorial (w/fee) Repeatable Math or Science	..	
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.. G-Studio	.. maximum credits		.. A&H (Literature)	..	
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.. H-Field course	.. from:		.. A&H (Non-Literature)	..	
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.. I-Study Abroad	.. to:		.. Social Science	..	
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.. L-Lab (no/fee) CCA	..	
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X N/B-Lecture/Lab(w/fee) STS	..	
--------------------------	----	--	--------	----	--

.. N/L-Lecture/Lab(no fee)	..				
----------------------------	----	--	--	--	--

.. Change Catalog Description:

from:

to:

X Change Prerequisite(s):

from: Co-req ENGR 130; for honors students, MTHSC 108 also

to: for honors students co-req of ENGR 130 and MTHSC 108

Learning Objectives: Apply basic drawing principles to visually represent engineering problems

Identify and accurately express drawings in any units required

Demonstrate proficiency in basic drawing skills

Demonstrate an understanding of process associated with a drawing editing

Demonstrate an understanding of the previously developed drawings

Appropriate use of graphical techniques to develop 2D and 3D objects

Appropriate use of dimension to enhance the understanding of a drawing

Demonstrate an understanding of professional and ethical responsibility

Demonstrate ability to effectively communicate using soft and hard copies

Topical Outline: Basics of 2-D Drawings

Land Survey

Hydrology

Road Design

Architectural Drawing

Family of Working Drawings

Evaluation: Individual Projects

Team Project

Homework

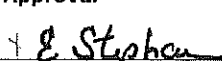
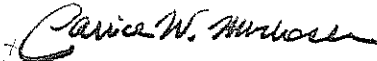
In Class Activities

Form Originator: JMINOR, John Minor Date Form Created: 11/4/2011

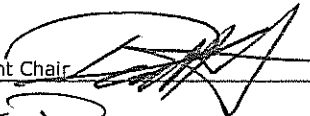
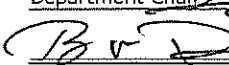

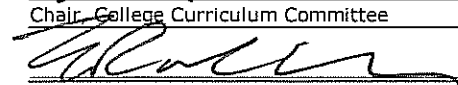

Form Last Updated by: , Date Form Last Updated: 3/7/2012

Form Number: 4660

Approval

	3/7/12		4/6/2012
Chair, Department Curriculum Committee	Date	Chair, Undergraduate Curriculum Committee	Date

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Department Chair		Date	3/16/12	Chair, Graduate Curriculum Committee		Date	
			3/27/2012				6/11/12
Chair, College Curriculum Committee		Date		Provost		Date	
			3/20/12				6/11/12
College Dean		Date		President		Date	
Director, Calhoun Honors College		Date					