**REQUEST FOR ADDITION OF NEW COURSE**

<table>
<thead>
<tr>
<th>Department: Civil and Environmental Engineering</th>
<th>College: Engineering</th>
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<tbody>
<tr>
<td>Date: 10/19/2017</td>
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</table>

**PROPOSED COURSE DESCRIPTION**

<table>
<thead>
<tr>
<th>Rubric &amp; No.</th>
<th>Title</th>
<th>Short Title (≤ 19 characters)</th>
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</thead>
<tbody>
<tr>
<td>CE 7425</td>
<td>Advanced Bridge Engineering</td>
<td>ADVANCED BRIDGE ENGR</td>
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<table>
<thead>
<tr>
<th>Semester Hours of Credit</th>
<th>Lecture:</th>
<th>Lab/Sem/Rec:</th>
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<tr>
<td>3</td>
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If combination course type, # hms. of credit for:

<table>
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<tr>
<th>Repeat Credit Max. (if repeatable):</th>
<th>credit hours</th>
<th>Graduate Credit?</th>
<th>Yes/No</th>
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Credit will not be given for this course and:

**Course Type (Indicate hours in the appropriate course type.)**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Recitation</th>
<th>Lec/Rec</th>
<th>Lec/Sem</th>
<th>Lec/Lab</th>
<th>Res/Ind</th>
<th>Clin/Pract</th>
<th>Intern</th>
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Maximum enrollment per section: (use integer, e.g. 25 not 20-30) 25

Grading System: Letter Grade X Pass/Fail Final Exam:** Yes X No

***(Attach justification if the proposed course will not hold a final exam during examination week.)***

**Course Description:**

CE7425 Advanced Bridge Engineering (3)

Recent advancement in bridge engineering in terms of analysis, design, and performance assessment, including both practice and research aspects.

**BUDGET IMPACT (IF ANSWER TO ANY QUESTION IS "YES", ATTACH EXPLANATION).**

If this course is approved, will additional staff be needed? Yes No X

Will additional space, equipment, special library materials or other major expense be involved? Yes No X

**Academic Affairs Approval:**

(Date)

**ATTACHMENTS (ATTACH THE FOLLOWING TO YOUR PROPOSAL)**

**JUSTIFICATION:** Justification must explain why this course is needed and how it fits into the curriculum. Will the course duplicate other courses?

**SYLLABUS:** Including 14 week outline of the subject matter; titles of text, lab manual, and/or required readings; grading scale and criteria

**APPROVALS**

Department Faculty Approval Date: 12/7/2017

Department Chair Signature: [Signature]

(Date)

College Faculty Approval Date: 11/12/2018

College Dean Signature: [Signature]

(Date)

Graduate Dean Signature: [Signature]

(Date)

Academic Affairs Approval: [Signature]

(Date)
RE: Justification for adding CE 7425: Advanced Bridge Engineering to the LSU catalog

To whom it may concern:

I am writing this letter to justify the addition of CE 7425 (Advanced Bridge Engineering) into the LSU catalog. Since I have joined the Structures Group of the Civil and Environmental Engineering at LSU, I have taught this graduate course as a special topics course six times: in Fall 2004 (10 students), Spring 2008 (6 students), Spring 2011 (12 students), Spring 2013 (12 students), Spring 2015 (10 students) and Spring 2017 (5 students). The students' evaluations have been always very positive and it is clear that our structural engineering graduate students have a strong interest for such a course.

Adding CE 7425 will not infringe on any existing course and will not require new faculty or any significant expense to be offered. This course has been taught every two years in the last ten years. Resilient civil infrastructures such as bridges is a very import topic for the safety and economy development of the nation. Such an advanced course has provided and will continue to provide a competitive edge to our graduate students in Structural Engineering when they deal with the national infrastructures issues in both practice and research. There is no other course in the College of Engineering at LSU that teaches Advanced Bridge Engineering. This course synergizes well with existing courses such as CE7409 (advanced Concrete Design), CE 7410 (Structural Reliability) and CE 7430 (Structural Design for Dynamic Loading).

The syllabus for the proposed CE 7425: Advanced Bridge Engineering is attached to this letter. If you have any questions or require any additional information, please contact me at cscai@lsu.edu and Tel: 225-578-8898

Sincerely,

Steve C.S. Cai
Edwin B. and Norma S. McNeil Distinguished Professor
Dept. of Civil and Environmental Engineering
Department of Civil and Environmental Engineering, Louisiana State University

CE 7701 Advanced Bridge Engineering

Spring 2017, 900-1020 M W 0125 TUREAUD HALL

Instructor: Dr. Steve Cai, P.E., Professor
Office: 3505B Patrick Taylor Hall
Phone: 578-8898, E-mail: CSCai@lsu.edu

Course Web Site: Moodle
Office Hours: open door policy or by appointment

Prerequisite: graduate standing

Course Catalog Description: Recent advancement in bridge engineering in terms of analysis, design, and performance assessment, including both practice and research aspects

This course will focus on the recent advancement in bridge engineering in terms of analysis, design, and performance assessment, including both practice and research aspects. While some theoretical background behind the design codes will be explained, the step-by-step applications of the design codes will not be emphasized in this graduate level course. Instead, the bridge performance, general bridge design and analysis procedure, state-of-the-art in bridge research, and complicated bridge systems will be discussed.

* Each student will be expected to lead discussions of selected topics.
* Presentation and individual report of a special research topic are required.
* Active discussion and interaction are expected.

Student Outcome Objectives:
1. Understand the general picture of bridge engineering.
2. Understand complicated bridge system performance.
3. Understand the general procedures of bridge performance evaluation.
4. Be able to conduct analysis for design of complicated structure system.
5. Develop fundamental skills in bridge research.
6. Understand state-of-the-art of bridge engineering

Assessment Methods:
1. Homework will be mainly literature reading and discussion preparation. Each student will be expected to lead discussions of selected topics.
2. Mid-term and final examinations.
3. Presentation and individual report of a special research topic is required.

Continual Improvement Methods:
1. At the end of the semester, a standard evaluation system will be used to improve future instruction and evaluate the efficiency of instruction.
2. At any time, students are welcome to give their opinions and suggestions directly to the instructor to improve the teaching. To your benefit, do not wait to the end of the semester to do so.

References:
2. Design of Modern Highway Bridge by Narendra Taly, McGraw-Hill.
4. AASHTO LRFD Bridge Design Specifications
5. AASHTO Standard Specifications for Highway Bridges

Grading:  

Mid-term and Final, 20% each; Homework and/or report, 20%; Classroom Presentation and Discussion 40%

Topics

Week 1:
  Part 1: Introduction to bridges

Weeks 2-3:
  Part 2: New material applications in bridges
  - Fiber reinforced polymers (FRP)
  - Smart materials (Piezo-electric, SMA and MR)
  - High performance materials, self-healing, Nano materials, etc.

Weeks 4-5:
  Part 3: Multi hazards effects on transportation infrastructures
  - Wave action on bridges
  - Wind action on bridges
  - Wind and vehicle combined effects on bridges
  - Bridge vibration reduction/control
  - Blast, fire, extreme temperature effect, etc.

Weeks 6-7
  Part 4: Bridge Instrumentation and Non Destructive Testing
  - Basics of instrumentation
  - Acoustic emission
  - Fiber optic system
  - Bridge field instrumentation and testing
  - Wireless monitoring

Weeks 8-9:
  Part 5: Bridge analysis and modeling
  - Finite element modeling
  - Prediction of bridge load distribution in finite element method
  - Prediction of bridge impact factor in finite element method

Weeks 10-11:
  Part 6: Bridge Capacity Rating and Maintenance
  - Bridge rating criteria
  - Analytical rating
  - Bridge rating through load testing
  - WIM and BWIM technologies
- Bridge damage detection

Weeks 12-14:
- Part 7: Bridge Performance and Design
  - Truss bridges
  - Curved bridges
  - Arch bridges
  - Cable-supported bridges
  - Suspension bridges
  - Segmental bridges

Description of Activities that will be Graded:
Mid-term Exams: A mid-term exam will be taken in class to test students’ both conceptual understanding of the state-of-the-art and the fundamental knowledge of bridge engineering. The exam grade will be computed as 20% correct.
Final Exam: A comprehensive final exam will be taken at the time and date published in the LSU scheduling book. The exam grade will be computed as 20% correct.
Homework: The homework grade is calculated as an average of the individual percent grades and will be computed as 20% correct. Due dates will be announced by emails and can be found on the course Moodle site.
Participation and presentation/report: Students are expected to actively participate in classroom discussion and conduct an independent project study, which will be computed as 40% correct. Each student will deliver an individual presentation to the whole class and submit a report to the instructor in the end of the semester. Students will suggest a topic related to bridge engineering and the instructor will approve it before proceed it. The presentation will be about 20 minutes and the report will be about 30 pages documenting the students’ understanding of the selected topic. The project will be graded based on the thoroughness and clarity of both the report and oral presentation. Excused absences will be handled following LSU Policy Statement on “Student Absence from Class” (PS-22) (https://sites01.lsu.edu/wp/policiesprocedures/policies-procedures/22/).

Disabilities Statement
Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities. The syllabus is available in alternate formats upon request. If you have a disability that may have some impact on your work in this class and for which you may require accommodations, please see a staff member in Disability Services so that such accommodations can be considered. Students that receive accommodation letters, please meet with me to discuss the provisions of those accommodations as soon as possible.

LSU student code of conduct
The LSU student code of conduct explains student rights and what is expected of student behavior. Students are expected to understand this code as described here: http://students.lsu.edu/saa/students/code. Any violations of the LSU student code will be duly reported to the Dean of Students.
### REQUEST FOR ADDITION OF NEW COURSE

**Department:** Civil and Environmental Engineering  
**College:** Engineering  
**Date:** 10/19/2017

**PROPOSED COURSE DESCRIPTION**

<table>
<thead>
<tr>
<th>Rubric &amp; No.</th>
<th>CE 7435</th>
<th>Title</th>
<th>Random Vibrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Title (&lt; 19 characters)</td>
<td>RANDOM VIBRATIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester Hours of Credit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If combination course type, # hrs. of credit for</td>
<td>Lecture: 3</td>
<td></td>
<td></td>
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<tr>
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<td>Lecture</td>
<td>Lab</td>
<td>Seminar</td>
</tr>
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<td>25</td>
<td></td>
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</tr>
<tr>
<td>Grading System:</td>
<td>Letter Grade</td>
<td>Pass/Fail</td>
<td>Final Exam:**</td>
</tr>
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</table>

**(Attach justification if the proposed course will not hold a final exam during examination week.)**

**Course Description:**

CE7435 Random Vibrations (3)

Description and characterization of stochastic processes and random fields; classical random vibrations; response of linear elastic structural systems subject to stochastic excitations; structural design of random systems with applications to earthquake engineering and wind engineering.

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**BUDGET IMPACT (IF ANSWER TO ANY QUESTION IS "YES", ATTACH EXPLANATION.)**

<table>
<thead>
<tr>
<th>If this course is approved, will additional staff be needed?</th>
<th>Yes</th>
<th>No</th>
<th>x</th>
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<td>Will additional space, equipment, special library materials or other major expense be involved?</td>
<td>Yes</td>
<td>No</td>
<td>x</td>
</tr>
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</table>

**Academic Affairs Approval:** (Date)

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**ATTACHMENTS (ATTACH THE FOLLOWING TO YOUR PROPOSAL)**

**JUSTIFICATION:** Justification must explain why this course is needed and how it fits into the curriculum. Will the course duplicate other courses?

**SYLLABUS:** Including 14 week outline of the subject matter; titles of text, lab manual, and/or required readings; grading scale and criteria

(For 4000-level, specify graduate student grading criteria if requirements differ for graduate and undergraduate students.)

**APPROVALS**

| Department Faculty Approval Date | 12/7/2017 |
| College Faculty Approval Date | 12/12/18 |

**Department Chair Signature** (date)

**Graduate Dean Signature** (date)

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**College Contact**

**E-mail**
October 16, 2017

RE: Justification for adding CE 7435: Random Vibrations to the LSU catalog

To whom it may concern:

I am writing this letter to justify the addition of CE 7435 (Random Vibrations) into the LSU catalog. I became an Assistant Professor in the Structures Group of the Civil and Environmental Engineering at LSU on October 15, 2007. Since then, I taught this course as a special topics course five times: in Spring 2008 (5 students), Spring 2010 (5 students), Spring 2013 (7 students), Spring 2015 (7 students), and Spring 2017 (6 students). The students’ evaluations have been always very positive and it is clear that our structural engineering graduate students have a strong interest for such a course.

Adding CE 7435 will not infringe on any existing course and will not require new faculty or any significant expense to be offered. It is noted that only few of the top Civil Engineering graduate programs in the nation offer such an advanced course and that this course has provided and will continue to provide a competitive edge to our graduate students in Structural Engineering. There is no other course in the College of Engineering at LSU that teaches stochastic dynamics. This course synergizes well with existing courses such as CE 7410 (Structural Reliability) and CE 7430 (Structural Design for Dynamic Loading) and may benefit even graduate students from other departments besides Civil and Environmental Engineering, e.g., from Mechanical Engineering, which also does not have a course that covers random vibrations.

The syllabus for CE 7435: Random Vibrations is attached to this letter. If you have any questions or require any additional information, please contact me at mbarbato@lsu.edu.

Sincerely,

Michele Barbato
Ph.D., P.E.
Associate Professor
Civil & Environmental Engineering
Louisiana State University and A&M College
3230B Patrick F. Taylor Hall
Baton Rouge, LA 70803
Ph.: 225-578-8719
E-mail: mbarbato@lsu.edu
CE 7435 Random Vibrations
Spring Semester 2017
Instructor: Michele Barbato, Ph.D., P.E.
1278 Patrick F. Taylor Hall, Mon-Wed 4:30 – 5:50PM

Catalog Description
Description and characterization of stochastic processes and random fields; classical random vibrations; response of linear elastic structural systems subject to stochastic excitations; structural design of random systems with applications to earthquake engineering and wind engineering.

Course credits: 3

Prerequisites
A background in Probability Theory and Deterministic Structural Dynamics is highly beneficial but not required, since the basic material necessary to understand Stochastic Processes and Random Vibrations of Structural Systems will be reviewed as part of the course. For any additional information, reading suggestions, and references, please contact the instructor.

Instructor & Contact Information
Dr. Michele Barbato
Office: 3230B Patrick F. Taylor Hall
Email: mbarbato@lsu.edu
Phone: 225-578-8719

Text & Reference Materials
1) Random Vibrations: Analysis of Structural and Mechanical Systems (REQUIRED)
Authors: Loren D. Lutes & Shahram Sarkani
Publisher: Elsevier
2) Reader CE 7700: Random Vibrations; Barbato M.

Office Hours
Hours: Mon - Wed 11:00AM-noon
Specific changes will be communicated in advance during the lectures.

Expectations
LSU’s general policy states that for each credit hour, you (the student) should plan to spend at least two hours working on course related activities outside of class. Since this course is for three credit hours, you should expect to spend a minimum of six hours outside of class each week working on assignments for this course. For more information see:
http://catalog.lsu.edu/content.php?catoid=12&navoid=822

Course Objectives
This course presents the main concepts used in describing and modeling Stochastic Processes and the analysis methods of classical Random Vibration Theory (i.e., linear elastic structural models with deterministic parameters subjected to stochastic excitations). The main objectives of this course are:

1. Developing students’ understanding of uncertainties of dynamic loading (earthquake, wind, blast, etc.) and providing the students with the necessary tools (i.e., random process theory) for describing, defining and analyzing these uncertain loadings.

2. Introducing random vibration methods for the determination of the probability structure of the response given the probability structure of the excitation and the dynamic properties of the structural and/or mechanical system.

3. Studying the effects of the uncertainties of dynamic loadings on the safety of structural/mechanical systems.

4. Presenting some applications in structural engineering (e.g., earthquake engineering and wind engineering).

At the end of the course, the students will have the necessary background for doctoral research in the field and the means for application of the theory to relevant engineering problems. The course is appropriate for both Master’s level and Ph.D. students.

Random vibration theory has applications in earthquake engineering, wind engineering, ocean/offshore engineering, coastal engineering, aerospace engineering (e.g., jet/rocket engine vibration, atmospheric turbulence), mechanical engineering (e.g., rotating machinery design, micro-electro-mechanical systems design, vehicle dynamics), transportation engineering (airport noise control, ground transportation effects, etc.) and many other engineering fields and sub-fields.

Grading Policy
The course final grade is based on a 100-point scale.
The points are accumulated in the following manner:

<table>
<thead>
<tr>
<th>Examinations:</th>
<th>Midterm test</th>
<th>Final Exam</th>
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<tbody>
<tr>
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<td>30</td>
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<tr>
<td>Homework</td>
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<td>Participation</td>
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<tr>
<td>Total</td>
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</table>

Additional factors affecting your final grade will be on-time completion of your home assignments, your instructor’s evaluation of the quality of work you have done, attendance &
participation in class discussions, and overall performance improvement as the semester progresses.

Midterm Test
The midterm test will be taken in class. Exam content will address both conceptual understanding and numerical problem solving. It will cover: (1) Basic Topics in Probability Theory, (2) Introduction to Random Processes, and (3) Some Important Random Processes.

Final Exam
The midterm test will be taken in class. Exam content will address both conceptual understanding and numerical problem solving. It will cover: (1) Linear Random Vibration of Structures, (2) Design of Structures for Random Excitation, and (3) Applications in Earthquake Engineering and Wind Engineering. Note that, even though the final exam focuses only the second part of the semester lectures, this material heavily builds on the material covered in the first part of the semester (i.e., before the midterm). Thus, the students will need to review comprehensively all material covered during the entire course.

Homework
Homework will be assigned approximately every other week. Due dates are listed on the Moodle website. The homework grade is calculated as an average of the individual percent grades. Further instructions will be given on the course Moodle site and in class.

Participation
The class participation grade will be used to access participation in classroom activities but not to access attendance. Students will solve in-class problems using a think-pair-share approach (i.e., solve the problem individually, compare their results with one of their colleagues, and then sharing their results to the entire class). These solutions will be collected at the end of the lectures. Missed in-class problems will be excluded from the grade for excused absences. For a list of excused absences, check LSU Policy Statement on “Student Absence from Class” (PS-22) (https://sites01.lsu.edu/wp/policiesprocedures/policies-procedures/22/).

Grading Scale
The final grade for the course will be assigned on the basis of the following scale:

- 100-97: A+
- 96-93: A
- 92-90: A-
- 89-87: B+
- 86-83: B
- 82-80: B-
- 79-77: C+
- 76-73: C
- 72-70: C-
- 69-67: D+
- 66-63: D
- 62-60: D-
- <59: F
Regrade Policy

All questions regarding the grading of any assignment/exam (other than points being summed incorrectly) are handled exclusively through written request and will only be accepted within the first week after grading is completed, announced in class and the assignment is made available. To submit a regrade request, print/type your name on a separate sheet of paper and include a concise explanation of all your concerns/questions and JUSTIFY why you think you deserve additional credit. Staple this sheet to the front of your graded assignment/exam and resubmit it to your instructor during office hours. The assignment/exam will be regraded in its entirety and returned to you. If you continue to have concerns, arrange for an appointment with your instructor to discuss the issue.

Academic Dishonesty

Unless otherwise stated, classroom assignments and examinations are to be completed on an individual basis. Sharing of segments of computer code, homework or reports is not allowed without obtaining prior written approval of your instructor and giving credit to the appropriate source. Group discussions are permitted but the actual engineering analyses, making design choices, writing computer programs and preparation of reports/assignments is the responsibility of each individual. Plagiarism and cheating will not be tolerated. You will be asked to sign a statement indicating you understand and agree to abide by the policies explained in class materials and detailed in the Code of Student Conduct (http://students.lsu.edu/saa/students/code). In accordance with the Code of Student Conduct, all matters concerning academic dishonesty or computer abuse may be turned over to the Dean of Students Office.

Accommodations for Students with Disabilities

Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities. The syllabus is available in alternate formats upon request. Any student with a documented disability needing academic adjustments is requested to speak with Disability Services and the instructor, as early in the semester as possible. All discussions will remain confidential. This publication/material is available in alternative formats upon request. Please contact Disability Services in 115 Johnston Hall, 225-578-5919 or www.lsu.edu/disability.
Tentative Schedule

1. Review of Basic Topics in Probability Theory (weeks 1 and 2)
   • random variables
   • probability distribution function and probability density function
   • jointly distributed random variables
   • conditional distribution
   • function of random variables
   • characteristic functions

2. Introduction to Random Processes (weeks 3, 4, and 5)
   • definition
   • specification of random processes
   • stationary and nonstationary processes
   • modes of convergence
   • differentiation of a random process
   • integration of a random process
   • spectral decomposition of a random process
   • ergodicity
   • multi-variate random processes (vector processes)
   • cross-correlation and cross-spectral analysis
   • multi-dimensional random processes (stochastic fields)
   • spatial random variability

3. Some Important Random Processes (week 6)
   • Gaussian or normal processes
   • Poisson processes
   • Markov processes

(Midterm)

4. Review of Basic Topics in Dynamics of Structural Systems (weeks 7 and 8)
   • second-order differential equation of motion: linear SDOF and MDOF systems
   • free vibrations
   • response to impulsive and transient loading
   • frequency domain methods
   • state-space methods [if time permits]

5. Linear Random Vibration of Structures (weeks 9, 10, 11)
   • single-degree-of-freedom (SDOF) oscillators
   • multi-degree-of-freedom (MDOF) systems
   • response to stationary excitation
   • response to nonstationary excitation
   • frequency domain approach
• state-space approach [if time permits]

6. Design of Structures for Random Excitation (weeks 12 and 13)
   • failure mechanisms due to random vibrations
   • level crossings
   • distribution of peaks
   • envelope crossings
   • first-excursion failures (first-passage problem)
   • fatigue failures [if time permits]

6. Applications in Earthquake Engineering (week 14)
   • modeling and simulation of earthquake ground motion
   • response spectrum method

7. Applications in Wind Engineering (week 14)
   • modeling and simulation of wind loading
   • distribution of extreme wind speeds

(Final exam)
POLICY STATEMENT on
Academic Honesty in All Credit Assignments*

It is the function of universities to educate professionals. During your tenure at LSU, it is expected that you adopt professional standards, which you will retain for the remainder of your professional life. Historically, all work represented as original work has been protected by a code of professional behavior (ethics) which holds that one may not borrow from the work of others without permission, nor even refer to their work without a full and complete reference to them as the authors. To do so is essentially an act of intellectual theft. Plagiarism is a violation of this ancient concept. A degree awarded by LSU is a statement to others that an individual has achieved a level of professionalism and has demonstrated a belief in the ethical standards demanded of all professions.

Another tenet of the code of ethics is that professionals assume full responsibility for the integrity and authenticity of their work. It is therefore incumbent upon each individual to be cautious to insure the security, authenticity, and accuracy of his or her professional work. Unless otherwise specifically stated, software, models, visual imagery, written assignments, etc. submitted for credit are expected to be solely the work of the individual student submitting the assignment and are thereby covered by this code of ethics.

If, in the view of the instructor, problem solutions were not developed independently, the students involved will be charged with violation of the Code of Student Conduct. According to University policy, both the giver and the receiver of information, if such distinction exists, are equally guilty and receive like sanctions. The sanctions prescribed for these offenses may also be found in the Code of Student Conduct. Copies of this document are available from the office of the Dean of Students or from the LSU website. Your instructor does not object to general discussion of concepts and methodologies, but the sharing of programs, sections of programs, written derivations or descriptions of algorithms or documentation without prior written approval is considered unacceptable collaboration and is strictly prohibited. If in doubt, ask your instructor.

Assignments do not have to be identical line for line or word for word to be considered evidence of unacceptable collaboration between students. Merely changing variable names, labels, comments or spacing should not be expected to disguise, from either the instructor or members of a Student Conduct Hearing Panel, the fact that unacceptable collaboration has occurred. It is also the responsibility of each student, insofar as the student has control, to ensure that his or her work does not fall into the hands of other students (e.g. program listings should not be left in places that are easily accessible to other students). Students are encouraged to keep dated copies of partially worked problems in order to be able to document their progress on the assignments. In addition to the above, any alteration of output, in any manner (such as changing the date, changing program results, etc.) is also considered a misrepresentation of one's professional work and is thereby academic dishonesty.

The preceding statements pertain only to assignments that are submitted for credit and are not intended to discourage students from studying or working extra problems together to increase their understanding of the material.

* Reproduced with permission by Prof. W.N. Waggenspack and paraphrased from a similar document used by the LSU Computer Science Department
REQUEST FOR ADDING, CHANGING, SUSPENDING OR DROPPING UNDERGRADUATE MINOR

Department: Civil & Environmental Engr.  College: Engineering  Date: 12/15/17
Name of Minor: Structural Engineering

Has this change been discussed with and approved by all departments/colleges affected? Yes (X)  No ( )  N/A ( )

ATTACH JUSTIFICATION for all actions: Use separate sheet.
ATTACH RESPONSE from any departments affected (i.e. any department whose course(s) are to be added).

ACTION (check appropriate box):
(X) ADDING: Show the entire new minor using catalog format. Use plain sheets and attach.
( ) CHANGING: List present catalog description which is to be changed (left column) and the changes proposed (right column). In proposed column use italics and bold to indicate deletions and additions. Explain all changes adequately on attachment.
( ) SUSPENDING: Provide an adequate explanation for suspending the minor on plain sheets and attach.
( ) DROPPING: Provide an adequate explanation for dropping the minor on plain sheets and attach.

### MINOR

<table>
<thead>
<tr>
<th>PRESENT</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total semester hours in current minor:</strong> 27</td>
<td><strong>Total semester hours in proposed minor:</strong> 21</td>
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<tr>
<td>To earn a minor in structural engineering, a student must complete CE 3415, CE 4400, CE 4410, CE4430 or CE 4460, CE 4435, and four additional courses chosen from an approved list (CE4300, CE4310, CE4420, CE4425, CE4440, CE4445, CE4450, CE4460). Only one maybe selected: CM3000 or CE3740, CE4780 or CE4781.) of technical/design/analysis electives available in the dean’s office. A grade of “C” or better in each course is required,</td>
<td>To earn a minor in structural engineering, a student must complete CE 3415, CE 4400, CE 4410, CE4430 or CE 4460, CE 4435, and two four additional courses chosen from an approved list (CE4300, CE4310, CE4420, CE4425, CE4440, CE4445, CE4450, CE4460) and no more than one of CE4300/CE4310/CE4660. Only one maybe selected: CM3000 or CE3740, CE4780 or CE4781.) The additional technical/design/analysis electives are available in the dean’s office. A grade of “C” or better in each course is required,</td>
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### APPROVALS

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<tr>
<th>Department Faculty Approval Date</th>
<th>12/15/17</th>
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<tr>
<td>Department Chair’s Signature</td>
<td>12/15/2017</td>
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<tr>
<td>Chair, FS C &amp; C Committee</td>
<td>12/15/17</td>
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<tr>
<td>College/Division/Department</td>
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<td>Contact Email</td>
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<th>College Faculty Approval Date</th>
<th>1/2/18</th>
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<tr>
<td>College Dean’s Signature</td>
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<tr>
<td>Academic Affairs Approval</td>
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( )
Justification

1. The current requirement of 27 credit hours is excessive when compared to the requirements for other minors in the college. The required courses for the minor and an additional two electives provide sufficient breadth in the structural engineering sub-discipline.
2. Removal of CM3000, CE4445 and CE 4425 was necessitated as these courses are no longer offered by the respective departments.
3. CE 4460 is one of the possible capstone design classes in the required list and was therefore removed from the electives list.
4. CE 3740, CE 4780, and CE 4781 are independent studies/special topics classes that do not add additional scope to the structural engineering minor with the reduced number of elective hours.
5. The addition of CE 4660 (Infrastructure Condition Assessment) is a new course that has been included to update the list of elective courses. CE4300/CE4310/CE4660 are from the Geotechnical and Transportation sub-disciplines and it was therefore felt that only one of these classes should be applicable in a two elective structural engineering minor.