REQUEST FOR ADDITION OF NEW COURSE

Department: School of Human Resource Education & Workforce Development
Date: 10/5/12

College: Human Sciences and Education

PROPOSED COURSE
Short Title: MEAS & MODULE'S HRE (≤ 19 characters)
Rubric & No.: HRE 7911
Title: Measures and Models of Human Resource Education

COURSE CREDIT
Graduate Credit: X YES __ NO

Semester Hours of Credit: 3
(For combination course types only: Lecture Hrs. Lab/Sem/Rec Hrs.
If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ___ credit hours.
Credit will not be given for this course and:

(Indicate rubrics and course numbers)

GRADING
Final Exam: X YES __ NO Grading System: x Letter Grade Pass/Fail
(Attach justification if the proposed course will not hold a final exam during examination week.)

COURSE TYPE
(Indicate hours in the appropriate course type)

/ LEC/REC / LEC/SEM 3 LEC ___ LAB ___ LEC/LAB ___ SEM ___ CLIN/PRACT ___ RES/IND

Maximum enrollment per section: 50 (use integer, e.g. 25 not 20-30)

CATALOG TEXT
(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

7911 Measures and Models of Human Resource Education (3) Prereq.: ELRC 7006 and 7016 or equivalent. Field-based psychological measurement and multivariate analysis techniques; exploring several measurement and multivariate statistical techniques used widely in the behavioral sciences; emphasizes understanding the measures and models from a practical perspective.

BUDGET IMPACT
If this course is approved, will additional staff be needed? X YES __ NO
Will additional space, equipment, special library materials or other major expense be involved? X YES __ NO
(if answer to either question above is ‘yes’ attach explanation.)

ATTACHMENTS
ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 9/26/12
College Faculty Approval 11-14-12

Department Chair’s Signature

Graduate Dean’s Signature (for 4000 level and above)

College Contact: cbenne5@lsu.edu

College Contact E-mail: cbenne5@lsu.edu

Academic Affairs Approval 
Justification for HRE 7911 Measures and Models of Human Resource Education

SHREWD wishes to institute a graduate-level Measures and Models course. The need for this course was established by the faculty through an extensive review of the curriculum during which a decision was made to change curriculum requirements to include this course. SHREWD views the course as essential for graduate training in human resource education. Currently, no such course exists in our department and our doctoral students need this course because most are now conducting some type of multivariate research, often including development of new measures. The proposed HRE 7911 course would be offered on an annual basis to graduate students as a required Human Resource and Leadership Development curriculum component for the Ph.D. degree programs beginning in the spring semester of 2013.
Course Objectives: This course covers current and emerging tools, measures, and models used by human resource professionals including HR construct analysis, HR modeling and advanced research techniques and interpretations of empirical results. The goal is for students to understand, conduct, and critically evaluate the use of field-based procedures for assessing and interpreting common models of human behavior. Students will learn to apply these HR measures and modeling concepts using SPSS, among other analytic tools that are common in HR practices.

Course Prerequisites: Students must have completed and passed Statistical Principles I (ELRC 7006 or equivalent) and Statistical Principles II (ELRC 7016 or equivalent)

Required Assigned Readings:

Student Responsibilities:
- Attendance is not required, but it is strongly encouraged. Students are responsible for all materials covered in lecture and in-class handouts or exercises, in addition to assigned reading from the text.
- Each week, students will submit at least one comment or question on the assigned readings. Students are encouraged to think about the topics prior to meeting and to participate in class discussions.
- Each student will be responsible for one lecture discussion consisting of approximately 30 minutes of presentation material.
- Five to seven homework assignments that will involve analyzing a set of data using SPSS and interpreting the findings will be assigned. Typically, each homework assignment will involve critical analysis, annotation of your output, and a one-two page summary of the results as appropriate for a journal article. Note: All write ups must be in APA format (this includes statistical notation). Specific instructions will be provided in advance of each assignment.

Peer-advising among students is encouraged, but students must work separately on the write-up portion. In other words, the write-up must demonstrate your understanding of the output and must be written one’s own words. Homework that is the same or highly similar will be flagged for review!
Mid-term and Final Exams
The mid-term exam will cover all material reviewed up to mid-term, and will be worth 30% of your final grade. The final exam will cover all material reviewed post the mid-term, and will be worth 25% of your final grade. The final exam WILL NOT be cumulative. Each exam will consist of multiple choice and True/False questions, short answer questions, quantitative problems, and short essay questions. No make-up exams will be given without a valid written excuse. Students wishing to take a make-up exam should contact me as soon as possible after missing an exam (i.e., within 24 hours), or if you anticipate missing an exam. If an exam is missed and no make-up is taken, a zero will be given for that exam.

Grading:
Two Exams 55%
Homework Assignments 35%
Discussion Leader & Participation 10%

Grading Table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 - 90</td>
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<tr>
<td>B</td>
<td>89 - 80</td>
</tr>
<tr>
<td>C</td>
<td>79 - 70</td>
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<tr>
<td>D</td>
<td>69 - 60</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 59</td>
</tr>
</tbody>
</table>

*All grades >0.5 will be rounded up.

Academic Integrity:
Academic integrity is a fundamental expectation of all students in this course. Cheating (for example copying answers from another student’s exam sheet, allowing another student to take an examination in your place, making use of notes during a closed book/closed notebook examination, etc.), plagiarism (representing the work of another individual as your own), and other forms of academic misconduct will not be tolerated. Suspected cases of academic dishonesty will be forwarded to the Dean of Students office. A grade will not be recorded until the issue is resolved. Please remember that assisting another student to cheat on an examination or assignment also constitutes academic misconduct and you will be accountable for knowingly providing such assistance.

For more information please review the LSU Student Code of Conduct:

Additional Course Resources
Center for Advanced Research Methods and Assessment (CARMA)
To access library: http://www.pubinfo.vcu.edu/carma/login.asp?lo=1
log-in: iopsyc@lsu.edu password: testsarefun

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Lecture Title</th>
<th>Speaker 1</th>
<th>Speaker 2</th>
<th>Speaker 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 29, 11</td>
<td>11 a.m. – 12:30 p.m.</td>
<td>The Use and Misuse of Ratios Measures</td>
<td>Dr. Robert Wiseman (Michigan State)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 26, 11</td>
<td>11 a.m. – 12:30 p.m.</td>
<td>Simple Models for Analyzing Network Change</td>
<td>Dr. Stephen Borgatti (Univ. of Kentucky)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 16, 11</td>
<td>11 a.m. – 3:15 p.m.</td>
<td>Cultivating the Discovery Process in Field Research</td>
<td>Dr. Karen Golden-Biddle (Boston Univ.)</td>
<td></td>
<td>Dr. Fran Yammarino (SUNY Binghamton)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multi-Level issues and WABA</td>
<td>Dr. Fran Yammarino (SUNY Binghamton)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Missing Data: Problems and Prospects</td>
<td>Dr. Dan Newman (Univ of Illinois)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Course Outline

General Schedule of HR Topics by Week
For each topic, select three readings per week from the corresponding list.

Weeks 1 - 3 How to tell is a test is valid for personnel selection and/performance prediction?


Harrison, D.A., & Klein, K.J. (2007). What’s the difference? Diversity constructs as separation, variety, or disparity in organizations. Academy of Management, 32. 1199-1228.


**Week 4 Catch-up**

**Week 5 -7 How to design a test to assess metrics of interest**


**Week 8 – Catch up**

**Week 9 – 11 Social implications of assessment and detecting adverse impact in HR decisions**


**Week 12 – Catch up**

**Week 13-15 Modeling social behaviors, cultures, and relationships in HR**
(SEM, and Hierarchical Linear Modeling or Social Network Analysis) Readings to be assigned.
I finally got the ok from EXST for this course (see below)! I think this is all you need to approve it.

Thanks!

Ed Holton, Ed.D.
Director, School of Human Resource Education & Workforce Development
Jones S. Davis Distinguished Professor of Human Resource, Leadership & Organization Development
298 Coates Hall
(225) 578-5748
www.lsu.edu/shrewd

Interim Associate Dean, Distance Learning & Leadership Programs
Dean’s Office | 221 Peabody Hall | Baton Rouge, LA 70803
(225) 578-7024 | F: (225) 578-2267
Email: chotlon2@lsu.edu | Website: www.lsu.edu/chse

From: Jay Geaghan
Sent: Thursday, May 29, 2014 2:46 PM
To: Ed Holton
Subject: RE: HRE 7911

Ed,
My faculty met and discussed your redesign of HRE 7911. We decided that it no longer overlaps with our multivariate course.

Good luck with that course in the future.

Jay Geaghan
Professor and Head
Dept of Experimental Statistics
Louisiana State University

From: Ed Holton
Sent: Tuesday, May 14, 2013 9:18 AM
To: Jay Geaghan
Subject: HRE 7911

Hi Jay

Just wondering if you all have had a chance to review the revised HRE 7911....and hopefully support it.

Thanks
Faculty Senate Courses and Curricula Committee

From: Lawrence Rouse, Chair, Courses and Curricula Committee
To: Michael Burnett, Director, School of Human Resource Education & Workforce Development

At their November 20th, 2012 meeting, the Faculty Senate Courses and Curriculum Committee took the following action regarding the HRE proposals:

**HRE 4581**
- The Committee conditionally approved the proposal to add HRE 4581: Advanced Organizational Psychology & Work Behavior pending a letter of support from the Rucks Department of Management. The content of the course seems similar in nature to a management course. Additionally, the syllabus must be revised to show the correct percentage amount for each grading criterion. This must be reflected throughout the entire syllabus.

**HRE 7577**
- The Committee conditionally approved the proposal to add HRE 7577: Training and Development in Organizations pending a more defined justification on how the course will fit into the curriculum and what is its cohort of students. How many graduate students does the Training and Development graduate concentration have? Explain why this course should not be taught as a special topics course first. Additionally, the grading criteria needs to be well defined; the participation and guided discussion should be described in detail. Note: The syllabus is a contract between the student and the instructor and must be thorough and clear.

**HRE 7727**
- The Committee conditionally approved the proposal to add HRE 7727: Advanced Leadership Theory and Practice pending a more defined justification on how the course will fit into the curriculum and what is its cohort of students. How many graduate students does the Training and Development graduate concentration have? Explain why this course should not be taught as a special topics course first.

**HRE 7911**
- The Committee conditionally approved the proposal to add HRE 7911: Advanced Measures & Multivariate Statistics pending a letter of support from the Department of Experimental Statistics. The content of the course seems similar in nature to an experimental statistics course. Additionally, the committee requests a more defined justification on how the course will fit into the curriculum and what is its cohort of students. How many graduate students does the Training and Development graduate concentration have? Explain why this course should not be taught as a special topics course first.

Please submit the requested documentation to Anna Castrillo in the Office of the University Registrar at 112 Thomas Boyd Hall or by email at castrl@lsu.edu.
If you have any questions regarding the request, please feel free to contact me at lrouse@lsu.edu.
REQUEST FOR ADDITION OF NEW COURSE

Department: Civil and Environmental Engineering
College: _

PROPOSED COURSE
Rubric & No.: CE3401
Title: HONORS: MECHANICS OF MATERIALS

COURSE CREDIT
Graduate Credit: YES x NO (complete for 4000 level courses only)
Semester Hours of Credit: 4
If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ___ credit hours.
Credit will not be given for this course and: CE3400

GRADING
Final Exam: YES x NO Grading System: Letter Grade Pass/Fail

CATALOG TEXT
(Convise catalog statement exactly as you wish it to appear in the LSU General Catalog)
3401 HONORS: Mechanics of Materials (Prereq.: Grade of “C” or better in CE 2450 or CE 2451. Credit will not be given for this course and CE 3400. Stress and strain, torsion, bending, deflections of beams, columns, statically indeterminate problems, combined stress.)

BUDGET IMPACT
If this course is approved, will additional staff be needed? YES x NO
Will additional space, equipment, special library materials or other major expense be involved? YES x NO

ATTACHMENTS
ATTACH THE FOLLOWING TO YOUR PROPOSAL.
JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 2/15/2013
College Faculty Approval 9/19/13
Department Chair’s Signature 9/27/13
College Dean’s Signature 9/27/13
Graduate Dean’s Signature (for 4000 level and above) (date)
Chair, FS C&C Committee (date)
Academic Affairs Approval (date)
HONORS: MECHANICS OF MATERIALS (CE3401)

Justification for course: The proposed course is honors level class of the currently available MECHANICS OF MATERIALS (CE3400) class. As per Honors college requirements, the new course introduces students to additional material in the form of a 3 hour lecture + 1 hour recitation.

While the 3 hour lecture follows the material taught in the regular class, the additional one hour recitation introduces students, in the form of group assignments, to solution to complex problems that students may encounter in engineering practice. The theoretical background and its application to simpler problems will be covered in the lecture class and homework assignments. However the group assignments would require students to use computational software, which will also be introduced in the recitation class. The complete list of homework/group assignments, for the first offering of the honors’ class, are listed in the proposed syllabus. It is expected that some of the group assignments would introduce material from higher level classes, and student feedback will be used to update the list of the problems used in future offerings of the honors level class.
**CE 3401 HONORS MECHANICS OF MATERIALS**  
**Fall 2013**

**INSTRUCTOR:**  
Suresh Moorthy  
Office: 3418E Patrick Taylor  
Phone: 578-8549  
E-mail: moorthy@lsu.edu  
Office Hours: MWF 11:30pm – 12:30pm & T-Th, 11am-1pm (Other times by appointment)


**PREREQUISITE:** Statics (CE2450 or equivalent)

**COURSE DESCRIPTION**
Mechanics of Materials Honors (CE 3401), which is also called as the “Strength of Materials” in some other institutions, is the basis for engineering classes in structural analysis. This class is the second level introductory class for the real structures for Civil Engineering, Mechanical Engineering, Engineering Mechanics, etc. Comparing to the introductory class, Static (CE 2450), this class deals with the deformation of structural members undergoing fundamental loading conditions, stress-strain relations, principles of stress transformation and stability of structural members. These considerations are essential for the design of real structures. Even though this class is at the introductory level, the knowledge acquired in this class can be used for the basic design and analysis of the real structures.

At the Honors level, an additional one hour of recitation per week will be used to augment material in the regular class period with additional numerical examples that would require students to solve more complex problems encountered in engineering practice using computational software available through the college of engineering.

**BASIC COURSE OBJECTIVES**
During this course the students will be trained to deal with structural components and systems from a mechanical point of view which is based on the logical way of thinking and to apply the derived analysis and design to a few, well-understood, structural components.

**STUDENT OUTCOME OBJECTIVES**
1. By knowing the procedures, methods, and requirements of the strength, deformation and stability analysis of structural components the student will be able to study the integrity of the structural components.
2. Given the combination or change in loading patterns the students should be able to access the strength and deformation pattern of the structural components.
3. To formulate and analyze the mathematics of the boundary value problem for the analysis of structural components.
4. To be able to relate the physics of the strength, deformation, and stability of a structural component to the mathematical formulation of these problems.
5. To introduce students to the basic ideas of computational methods used to solve complex problems in modern engineering practice.

**ASSESSMENT OF STUDENT OUTCOMES**
1. **Homework** will be assigned each class period from the textbook. Homework is **due at the beginning of the next class day**. No homework is accepted at the end of the lecture. If you come in late please turn in homework before you are seated. All homework must be submitted on engineering paper and neatly in order to obtain fullest credit. Students are encouraged to work together but **copying is not allowed**. Some of the homework problems will be graded for credit (in its entirety), while others will be graded for attempt
Solutions and grades to assignments will be available in Moodle shortly after graded homeworks are returned. Any changes to the grade should be made within 5 days of grade being posted. Note that missed HWs will be excused under instructors discretion. For example, in case of a medical emergency, students should provide a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse. It is expected that most students will require a minimum of 3-4 hours of study/hwk outside of class for every 50-minutes of lecture to adequately prepare for the next class. See item 4) in section ‘IMPORTANT NOTES’ for more details in the class.

2. **Quizzes** will be approximately 15 minutes duration and cover material from the previous week and will be given on designated days in class as stated in the course outline. No makeup quizzes will be given, as this also encompasses part of the attendance requirements of the course. Solutions and grades to quizzes will be available in Moodle shortly after graded quizzes are returned. Any changes to the grade should be made within 5 days of grade being posted. Note that missed quizzes will be excused under instructors discretion. For example, in case of a medical emergency, students should provide a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse.

3. **Assignments** Computational assignments that illustrate numerical methods used to solve the problems demonstrated in the lecture class will be discussed in the recitation classes. These methods will be used to solve complex problems which while being practically applicable do not lend themselves to an easy pencil/paper solution. Assignments will be collected by the next recitation period and will encompass additional material honors level students will have to demonstrate.

4. **Exams** will be used to determine the students' ability to apply several concepts to a single problem in order to obtain the desired solution. No makeup exams will be given without a minimum of 24 hours advance notice and adequate proof of an emergency situation. If advance notice is not possible in the emergency situation, the instructor must be notified no later than 3 days after the scheduled day of the exam in order to be eligible for a makeup exam. For example, in case of a medical emergency, the written excuse should include a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse. Any changes to the grade should be made within 5 days of grade being posted on Moodle.

5. A comprehensive **final exam** of two hours duration will test the ability of the student to synthesize related concepts from course topics and to demonstrate their assimilation of the course material.

6. **Bonus:** One component of the student assessment is class participation. Bonus points will be given for answering questions and additional homework assignments. The bonus points will be added into the final grade and cannot exceed 1% of the course grade

**Note:** Any student who has been tested eligible for extra time on exams/quizzes by the Office of Disability Services (ODS) must take their exams/quizzes at ODS and comply with their rules and time schedules. (See instructor for details as well as: www.lsu.edu/disability)

**Note:** If you have more than two exams on that day or another exam scheduled for the exact same time frame, make sure you fill out a form from the College of Engineering office and give it to your instructor (along with the rest of your final exam schedule) one month before final exam date, so that an appropriate makeup exam date can be established.

5. **Grading Policy**

The grade distribution adopted in this course is the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three-one-hour exams (3 x 50)</td>
<td>150 pts</td>
<td>(30%)</td>
</tr>
<tr>
<td>Two-hour final exam</td>
<td>150 pts</td>
<td>(30%)</td>
</tr>
<tr>
<td>Quizzes &amp; assignments</td>
<td>150 pts</td>
<td>(30%)</td>
</tr>
<tr>
<td>Homeworks</td>
<td>50 pts</td>
<td>(10%)</td>
</tr>
</tbody>
</table>
Total
500 pts. (100%)

The final grade will be based on the following point scale:

- **A** 450 - 500 pts. \((\geq 90\%)\)
- **B** 400 - 449 \((\geq 80\% \& < 90\%)\)
- **C** 350 - 399 \((\geq 70\% \& < 80\%)\)
- **D** 300 - 350 \((\geq 60\% \& < 70\%)\)
- **F** < 300 \(< 60\%)\)

Any grade change you see justified should be brought to the attention of the instructor within five days of receiving the grade. This includes exams, quizzes assignments and homework. Note that this grading scale does not reflect requirements for honors college credit.

**OTHER REQUIREMENTS**

1. **Blue books (BBs):** Students must submit four full-sized blue books \((8 \frac{1}{2}'' \times 11'' \text{ and minimum of 8 leaves - 16 pages})\) to the instructor the first week of class. **No student will be allowed to bring their own blue book for the exams.** The student's name must be on the back upper left corner to be properly credited.

2. **Attendance:** Attendance is mandatory. After three consecutive absences or 5+ absences in any one month, the student's name may be turned in to the Dean of Engineering office for appropriate action.

**IMPORTANT NOTES**

1. **Exams' Time:** Methods presented in the lecture usually consist of a faster way of solving a problem. Many students may have learned a certain way in other courses and are reluctant to let go of the old method and learn a "new" method. Due to the time factor on the exams, the problems are designed to test the students' ability to ascertain what the problem requires and the best method for achieving its solution. However, the instructor is at liberty to test a particular method. Furthermore, the students will, throughout their academic and professional careers, be required to perform optimally.

2. **Grading Policy:** No curves; you must know the material in order to pass the course. Moreover, seniors expected to graduate will be graded the same as everyone else.

3. **Regrade Policy:** All questions regarding the grading of any assignment/exam 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 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. Any excuses for missed HWs/quizzes should be provided to the instructor, in written form, within 3 days of missed HW/quiz. For example, in case of a medical emergency, the written excuse should include a doctor's note (with doctor's name and phone number) which can be used to ascertain the excuse. All excused HWs/quizzes will not be included in the final grade calculation. However, note that exams cannot be excused.

4. **Moodle:** Class notes, solution sets for HWs/Quizzes/Exams and grades obtained thereof will be periodically posted through Moodle. Note that class notes posted on Moodle will be incomplete (i.e. instructor will complete the notes in class) and students are expected to bring a copy of the class notes. Students are expected to verify their grades and make any changes within 5 days of the grade being posted on Moodle. No correction of grades, past the instructor specified dates, will be permitted. **NOTE that the grades in Moodle does not necessarily give the correct final grade.** It is only to verify that the instructor has the correct information pertaining to the student. Students can access the Moodle website through (a) moodle2.lsu.edu and (b) entering their PAWS userid\&password in the website.
5. **Classroom Courtesy:** It is expected that each student will treat all members of the class with courtesy and respect. Any disrespect on the basis of race, religion, gender, or special needs will not be tolerated. All students are expected to adhere to the LSU Code of Student Conduct (at www.lsu.edu/judicialaffairs). Disruptive behavior in the classroom is not tolerated and includes, but is not limited to: talking while instructor is talking, studying for another exam or doing homework for another class with a partner, passing food, drink, or notes around to others, sleeping or reading the newspaper during the lecture, listening to CD's or anything with headsets, taking phone calls, arriving to or leaving class during the lecture, packing book bags while lecture is still in progress. If you know you must leave early, inform the instructor in advance and sit as close to the exit door as possible.

6. **Academic Integrity:** The Code of Student Conduct includes LSU's standards of academic integrity. It is expected that each student will embrace the standards of the University and not tolerate liars, cheaters, thieves. Confront them. Don't ignore them, and if necessary report them. The Code requires instructors to report ALL academic misconduct violations to the Office of Judicial Affairs (OJA). Some specific examples of academic misconduct are, but not limited to: copying, using unauthorized materials during a quiz or exam, failing to follow instructor's instructions, submitting work of another or providing work to another student for copying, misrepresenting identity, and attempting to commit an act of academic misconduct. Anyone who engages in academic dishonesty can expect to receive a permanent grade of "F" for the course and other sanctions as determined by OJA. Please see "LSU College of Engineering Policy Statement" regarding Academic Integrity in page 7 and "Pledge of Professional Conduct" (POPC) posted on Moodle.

**Best of luck to all of you**

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**TENTATIVE SYLLABUS AND ASSIGNMENTS**

(Subject to change, please refer to Moodle for daily HW/quiz/assignment schedule)

<table>
<thead>
<tr>
<th>Week #</th>
<th>Text section</th>
<th>Topic</th>
<th>Hw/Assn #</th>
<th>Tentative HW</th>
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</thead>
<tbody>
<tr>
<td>1, lecture 1</td>
<td>1.1–1.4</td>
<td>Introduction, statics, stress concept., Normal stress, shearing stress</td>
<td>HW1</td>
<td>1.3, 1.7, 1.8, 1.9</td>
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<tr>
<td>lecture 2</td>
<td>1.5–1.7</td>
<td>Bearing stress, Design, factor of safety</td>
<td>HW2</td>
<td>1.11, 1.15, 1.19, 1.40, 1.55</td>
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<td></td>
<td>Introduction to Maple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, lecture 1</td>
<td>2.1–2.3, 2.5</td>
<td>Strain, stress-strain diagram, Hooke’s law, Axial deformation</td>
<td>HW3</td>
<td>2.2, 2.4, 2.8, 2.13</td>
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<td>lecture 2</td>
<td>2.6–2.8</td>
<td>Axial deformation (contd.), Statically indeterminate.</td>
<td>HW4</td>
<td>2.14, 2.21, 2.28, 2.35, 2.42</td>
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<tr>
<td>recitation</td>
<td></td>
<td>Introduction to Matlab</td>
<td></td>
<td></td>
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<tr>
<td>3, lecture 1</td>
<td>2.9–2.13</td>
<td>Thermal probems. Poisson’s ratio,</td>
<td>HW5</td>
<td>2.46, 2.49, 2.53</td>
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<tr>
<td>lecture 2</td>
<td>2.14–2.15</td>
<td>Generalized Hooke’s law, shear strain</td>
<td>HW6</td>
<td>2.60, 2.68, 2.79 Skills test is due</td>
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<tr>
<td>recitation</td>
<td></td>
<td>Computational problems for axially loaded struct. (Matlab)</td>
<td>Assn1</td>
<td>1.6C, 2.2C</td>
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<tr>
<td>Week #</td>
<td>Text section</td>
<td>Topic</td>
<td>HW/Assn #</td>
<td>Tentative HW</td>
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</tr>
<tr>
<td>4, lecture 1</td>
<td>3.1-3.4 Quiz (1)</td>
<td>Torsion of circular shafts, Shear stress, angle of twist</td>
<td>HW7</td>
<td>3.1, 3.11, 3.17, 3.32</td>
</tr>
<tr>
<td>lecture 2</td>
<td>3.4-3.6 Angle of twist (contd.), Statically indeterminate</td>
<td></td>
<td>HW8</td>
<td>3.37, 3.41, 3.51, 3.54, 3.57 (In P3.41 calculate max. shear stress in AB and EF) Bils are due</td>
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<tr>
<td>recitation</td>
<td>Computational problems for torsionally loaded structure (Matlab)</td>
<td></td>
<td>Assn2</td>
<td>3.2, 3.6</td>
</tr>
<tr>
<td>5, lecture 1</td>
<td>3.7, 3.13 Quiz (2)</td>
<td>Design, thin wall</td>
<td>HW9</td>
<td>3.64, 3.65, 3.142, 3.144</td>
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<tr>
<td>lecture 2</td>
<td>4.1-4.4 Bending</td>
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<td>HW10</td>
<td>4.2, 4.9, 4.15</td>
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<td>6, lecture 1</td>
<td>4.6</td>
<td>Bending of members made of several materials, Exam 1 review</td>
<td>HW11</td>
<td>4.40, 4.41, 4.42, 4.51, 4.54</td>
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<tr>
<td>lecture 2</td>
<td>4.6, 4.12-4.14 Bending of members made of several materials (contd.), Eccentric axial loading, unsymmetric bending</td>
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<td>HW12</td>
<td>4.105, 4.132, 4.136, 4.138, 4.144</td>
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<tr>
<td>recitation</td>
<td>Bending resistance and of functionally graded composites (Maple)</td>
<td></td>
<td>Assn3</td>
<td>Problems posted on Moodle</td>
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<tr>
<td>7, lecture 1</td>
<td>5.1, 5.2 Shear Force Diagram (SFD), and Bending Moment Diagram (SFD) by method of sections</td>
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<td>HW13</td>
<td>5.6, 5.9, 5.16</td>
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<tr>
<td>lecture 2</td>
<td>5.2 (contd.), 5.3 Method of sections (contd.), Relations among load, shear, bending-moment (graphical method for SFD and BMD)</td>
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<td>HW14</td>
<td>5.24, 5.59, 5.39</td>
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<tr>
<td>recitation</td>
<td>Direct integration for SFD&amp;BMD (Maple)</td>
<td></td>
<td>Assn4</td>
<td>5.118, 5.2, 5.4</td>
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<th>Topic</th>
<th>HW/Assn #</th>
<th>Tentative HW</th>
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<tr>
<td>8, lecture 1</td>
<td>5.4, Quiz (3) Design of prismatic beams</td>
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<td>HW15</td>
<td>5.9, 5.24, 5.59, 5.157</td>
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<td>lecture 2</td>
<td>6.1-6.2 Shear stresses in beams</td>
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<td>HW16</td>
<td>6.2, 6.3, 6.5, 6.9</td>
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<td>9, lecture 1</td>
<td>6.3-6.4, 6.6-6.7, Quiz (4) Shear stresses in beams (contd.), thin-walled members</td>
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<td>HW17</td>
<td>6.10, 6.29, 6.33, 36</td>
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<td>lecture 2</td>
<td>19-Mar Transformation of stress, principal stresses</td>
<td></td>
<td>HW18</td>
<td>7.1, 7.5, 7.9, 7.15</td>
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<tr>
<td>recitation</td>
<td>Plotting of SFD&amp;BMD (Matlab)</td>
<td></td>
<td>Assn4 (cont.)</td>
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<tr>
<td>10, lecture 1</td>
<td>21-Mar Mohr's circle for stress</td>
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<td>HW19</td>
<td>7.18, 7.32, 7.37</td>
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<td>11, lecture 1</td>
<td>7.4 Mohr's circle for stress (contd.)</td>
<td></td>
<td>HW20</td>
<td>7.54, 7.59</td>
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<tr>
<td>lecture 2</td>
<td>7.5, 7.6 3D Mohr's circle, Transformation of strain</td>
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<td>HW21</td>
<td>7.68, 7.73, 7.78</td>
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<tr>
<td>recitation</td>
<td>3D stress transformation using matrices (Matlab)</td>
<td></td>
<td>Assn5</td>
<td>Problems posted on Moodle</td>
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<td>13, lecture 1</td>
<td>9.5 Indeterminate beams</td>
<td>HW24</td>
<td>9.20, 9.30, 9.84</td>
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<td>9.7 Superposition, Exam 3 review</td>
<td>HW25</td>
<td>9.65, 9.69, 9.75</td>
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<tr>
<td>14, lecture 1</td>
<td>9.7, 10.1-10.2 Superposition (Contd.), Stability of Structures—Introduction</td>
<td>HW26</td>
<td>9.79, 9.81, 9.84</td>
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<td>10.1-10.4 Euler Buckling, Final exam review</td>
<td>HW27</td>
<td>10.2, 10.4, 10.5, 10.13, 10.25, 10.27</td>
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</tr>
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</table>
Faculty Senate Courses and Curricula Committee

From: Lawrence Rouse, Chair, Courses and Curricula Committee

October 16, 2013

At their October 15th, 2013 meeting, the Faculty Senate Courses and Curriculum Committee took the following actions regarding the CE proposals.

**CE CURRICULUM**
- The Committee approved the changes to the CE curriculum.

**CE 2451, 2461, AND 3401**
- The Committee returned the proposals to add CE 2451, 2461, and 3401. The lab/recitation format of these HONORS courses increases the total credit hours to 4, not the proposed 3 credit hours. The Committee believes these courses to be four credit hour courses. The department may also opt to drop a lecture hour from each course to keep the proposed three credit hour.

**CE 2450, 2460, and 3400**
- The Committee tabled these proposals pending the submission and approval of their HONORS counterparts.

Please submit the requested documentation to Anna Castrillo in the Office of the University Registrar at 112 Thomas Boyd Hall or by email at acastril@lsu.edu.

If you have any questions regarding the request, please feel free to contact me at rouse@lsu.edu.
For the CE HONORS courses, are they lecture/lab courses, or lecture/recitation courses?

Lecture Recitation
REQUEST FOR ADDITION of NEW COURSE

Department: Civil and Environmental Engineering

College: 

PROPOSED COURSE

Short Title: HNRS: DYNAMICS & VIBR

Rubric & No.: CE2461

Title: HONORS: DYNAMICS and VIBRATION

COURSE CREDIT

Graduate Credit: YES NO (complete for 4000 level courses only)

Semester Hours of Credit: 4 (For "Lecture/Lab" type courses only: Lecture Hrs. Lecture Hrs).

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of credit hours.

Credit will not be given for this course and: CE2460, ME 3133

GRADING

Final Exam: YES NO Grading System: Letter Grade Pass/Fail

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

COURSE TYPE

Check one type: LEC LAB LEC/LAB SEM CLIN/PRACT RES/IND

Maximum enrollment per section: 35

Total weekly contact hours: 4 (use integer, e.g. 25 not 20-30)

CATALOG TEXT

2461 HONORS: Dynamics and Vibration (4) Prereq.: grade of "C" or better in CE 2450 or CE 2451 and credit or registration in MATH 2065. Credit will not be given for this course and ME 3133 and CE 2460. Treatment of kinematics and kinetics of particles and rigid bodies; force, movement, velocity, acceleration; impulse and momentum; work and energy; dynamics and vibration; concepts applied to structural and machine components.

BUDGET IMPACT

If this course is approved, will additional staff be needed? YES

Will additional space, equipment, special library materials or other major expense be involved? YES

ATTACHMENTS

ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 2/15/2013 College Faculty Approval 9/19/13

Department Chair's Signature 9/17/13 College Dean's Signature 9/23/13

Graduate Dean's Signature (for 4000 level and above) Chair, FS C&C Committee 6/18/2014

Academic Affairs Approval
HONORS: DYNAMICS AND VIBRATIONS (CE2461)

**Justification for course:** The proposed course is honors level class of the currently available DYNAMICS AND VIBRATIONS (CE2460) class. As per Honors college requirements, the new course introduces students to additional material in the form of a 3 hour lecture + 1 hour recitation.

While the 3 hour lecture follows the material taught in the regular class, the additional one hour recitation introduces students, in the form of group assignments, to solution to complex problems that students may encounter in engineering practice. The theoretical background and its application to simpler problems will be covered in the lecture class and homework assignments. However the group assignments would require students to use computational software, which will also be introduced in the recitation class. The complete list of homework/group assignments, for the first offering of the honors' class, are listed in the proposed syllabus. It is expected that some of the group assignments would introduce material from higher level classes, and student feedback will be used to update the list of the problems used in future offerings of the honors level class.
INSTRUCTOR: Dr. Suresh Moorthy  
Office: 3418E Patrick Taylor, Phone 578-8549, E-mail: moorthy@lsu.edu  
Office Hours: M., W., F. 11:30am-12:30pm & T.,Th. 11am-1pm  
(Other times by appt.)  
You are welcome at any time if my office door is open.


PREREQUISITE: STATICS (CE2450 or equivalent)  
COREQUISITE: ELEMENTARY DIFFERENTIAL EQUATIONS (MATH2065 or equivalent)

COURSE DESCRIPTION

Dynamics and Vibration Honors (CE 2461) is the first course in dynamics. This course presents a treatment of kinematics and kinetics of particles and rigid bodies, impulse-momentum and work-energy for particles and rigid bodies and dynamics and vibration for particles and rigid bodies as applied to structural and machine components.  
At the Honors level, an additional one hour of recitation per week will be used to augment material in the regular class period with additional numerical examples that would require students to solve more complex problems encountered in engineering practice using computational software available through the college of engineering.

BASIC COURSE OBJECTIVES

During this course the students will be trained to deal with structural components and systems from a mechanical point of view which is based on the logical way of thinking and to apply to its analysis and design a few, well-understood, basic principles.

STUDENT OUTCOME OBJECTIVES

1. Understanding kinematics of particles and rigid bodies such as the relationship among position, velocity, and acceleration.
2. Understanding the kinetics of particles and rigid bodies and use of force equilibrium and moment equilibrium to solve problems of motion (Newton's second law).
3. Use energy and momentum methods to solve problems of motion.
4. Be able to understand the fundamentals of mechanical vibration.
5. Be able to numerically simulate solutions to linear/nonlinear numerical differential equations generated for system discussed in the above topics.

ASSESSMENT OF STUDENT OUTCOMES

1. Homework will be assigned each class period from the textbook. Homework is due at the beginning of the next class day. No homework is accepted at the end of the lecture, if you come in late please turn in homework before you are seated. All homework must be submitted on engineering paper and neatly in order to obtain fullest credit. The problems assigned to turn in will be graded on the basis of completion (3 pts), partially done (2 or 1 pt), or 0 if not turned in.
or is sloppily done. Students are encouraged to work together but copying is not allowed, neither from each other or from the solution manual or previously released solution from another semester. Solutions and grades to assignments will be available in Moodle shortly after graded homeworks are returned. **It is your responsibility to check your returned homeworks for correctness (both in procedure and final answer) regardless of the grade you get.** Changes to homework grade should be made within five days of the grade being posted. There will be no makeup homeworks, but they may be excused under the instructors discretion. For example, in case of a medical emergency, the written excuse should include a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse.

It is expected that most students will require a minimum of 3-4 hours of study/hwk outside of class for every 50-minutes of lecture to adequately prepare for the next class.

2. **Quizzes** will be approximately 15-25 minutes duration and cover material from the previous homeworks and will be given on designated days in class as stated in the course outline. Solutions and grades to quizzes will be available in Moodle shortly after they are graded. **It is your responsibility to check your returned quizzes for correctness (both in procedure and final answer) regardless of the grade you get.** Changes to quiz grade should be made within five days of the grade being posted. No makeup quizzes will be given, but they may be excused under the instructors discretion. For example, in case of a medical emergency, the written excuse should include a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse.

3. **Assignments** Computational assignments that illustrate numerical methods used to solve the problems demonstrated in the lecture class will be discussed in the recitation classes. These methods will be used to solve complex problems which while being practically applicable do not lend themselves to an easy pencil/paper solution. Assignments will be collected by the next recitation period and will encompass additional material honors level students will have to demonstrate.

4. **Exams** will be used to determine the students’ ability to apply several concepts to a single problem in order to obtain the desired solution. There will be **three exams** throughout the semester each on one hour duration and will be given in the class on designated days as stated in the course outline. Solutions and grades to exams will be available in Moodle shortly after they are graded. **It is your responsibility to check your returned exams for correctness (both in procedure and final answer) regardless of the grade you get.** Changes to exam grade should be made within five days of the grade being posted. No makeup exams will be given without a minimum of 24 hours advance notice and adequate proof of an emergency situation. If advance notice is not possible in the emergency situation, the instructor must be notified no later than one week after the scheduled day of the exam in order to be eligible for a makeup exam. For example, in case of a medical emergency, the written excuse should include a doctor’s note (with doctor’s name and phone number) which can be used to ascertain the excuse. **Note that exams cannot be excused, you will have to schedule a makeup.**

5. A comprehensive **final exam** of two hours duration will test the ability of the student to synthesize related concepts from course topics and to demonstrate their assimilation of the course material.

6. **BONUS:** One component of the student assessment is in the form of extra credit assignments or problems in exams. Bonus points will also be given for answering questions, asking questions in class and after class, and showing great interest in the subject. **The bonus points will be added into the final total grade, not to exceed 1%.**
NOTE:
1) If you have more than two exams on that day or another exam scheduled for the exact same time frame, make sure you fill out a form from the College of Engineering office (3304 CEBA) and give to your instructor, by the first week of April, with the rest of your exam schedule so that an appropriate makeup exam date can be established.
2) Any student who has been tested eligible for extra time on exams by the Office of Disability Services (ODS) must take their exams at ODS and comply with their rules and time schedules. (See instructor for details as well as: www.lsu.edu/disability)

GRADING POLICY
The grade distribution adopted in this course is the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three-one-hour exams (3 x 75)</td>
<td>150</td>
<td>30%</td>
</tr>
<tr>
<td>Two-hour final exam</td>
<td>150</td>
<td>30%</td>
</tr>
<tr>
<td>Quizzes and assignment</td>
<td>150</td>
<td>30%</td>
</tr>
<tr>
<td>Homework</td>
<td>50</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>500</td>
<td>100%</td>
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</table>

The final grade will be based on the following point scale:

- A  450 – 500 pts.  (≥ 90%)
- B  400 – 449      (≥ 80% & < 90%)
- C  350 – 399      (≥ 70% & < 80%)
- D  300 – 349      (≥ 60% & < 70%)
- F  < 300          (< 60%)

Any grade change you see justified should be brought to the attention of the instructor within five days of the grade being posted on Moodle. This includes exams, quizzes, assignments and homework. Note that this grading scale does not reflect requirements for honors college credit.

OTHER REQUIREMENTS
1. **Blue books**: Students must submit four full-sized blue books (8 ½” x 11” and minimum of 8 leaves – 16 pages) to the instructor the first week of class. No student will be allowed to bring their own blue book for the exams. The student’s name must be on the back upper left corner to be properly credited.

2. **Attendance**: Attendance is mandatory. After three consecutive absences or 5+ absences in any one month, the student’s name may be turned in to the Dean of Engineering office for appropriate action.

IMPORTANT NOTES
1. **Exams' Time:** Methods presented in the lecture usually consist of a faster way of solving a problem. Many students may have learned a certain way in other courses and are reluctant to let go of the old method and learn a "new" method. Due to the time factor on the exams, the problems are designed to test the students' ability to ascertain what the problem requires and the best method for achieving its solution. However, the instructor is at liberty to test a particular method. Furthermore, the students will, throughout their academic and professional careers, be required to perform optimally.

2. **Grading Policy:** No curves; you must know the material in order to pass the course. Moreover, seniors expected to graduate will be graded the same as everyone else.

3. **Regrade Policy:** All questions regarding the grading of any assignment/exam 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 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.

4. **Moodle:** Class notes, solution sets for HWs/Quizzes/Exams and grades obtained thereof will be periodically posted through Moodle. Note that class notes posted on Moodle will be incomplete (i.e. instructor will complete the notes in class) and students are expected to bring a copy of the class notes. Students are expected to verify their grades by instructor within 5 days of grade being posted. No correction of grades will be permitted past after this date. **Note that the grades in Moodle does not necessarily give the correct final grade.** It is only to verify that the instructor has the correct information pertaining to the student. Students can access the Moodle website through (a) moodle2.lsu.edu and (b) entering their PAWS userid&password.

5. **Classroom Courtesy:** It is expected that each student will treat all members of the class with courtesy and respect. Any disrespect on the basis of race, religion, gender, or special needs will not be tolerated. All students are expected to adhere to the LSU Code of Student Conduct (at www.lsu.edu/judicialaffairs). Disruptive behavior in the classroom is not tolerated and includes, but is not limited to: talking while instructor is talking, studying for another exam or doing homework for another class with a partner, passing food, drink, or notes around to others, sleeping or reading the newspaper during the lecture, listening to CD’s or anything with headsets, taking phone calls, arriving to or leaving class during the lecture, packing book bags while lecture is still in progress. If you know you must leave early, inform the instructor in advance and sit as close to the exit door as possible.

6. **Academic Integrity:** The Code of Student Conduct includes LSU’s standards of academic integrity. It is expected that each student will embrace the standards of the University and not tolerate liars, cheaters, thieves. Confront them. Don’t ignore them, and if necessary report them. The Code requires instructors to report ALL academic misconduct violations to the Office of Judicial Affairs (OJA). Some specific examples of academic misconduct are, but not limited to: copying, using unauthorized materials during a quiz or exam, failing to follow instructor’s instructions, submitting work of another or providing work to another student for copying, misrepresenting identity, and attempting to commit an act of academic misconduct. Anyone who engages in academic dishonesty can expect to receive a permanent grade of "F" for the course and other sanctions as determined by OJA. Please see "LSU College of Engineering Policy..."
Statement" regarding Academic Integrity in page 7 and "Pledge of Professional Conduct" (POPC) posted on Moodle.

SYLLABUS AND ASSIGNMENTS

<table>
<thead>
<tr>
<th>Week #</th>
<th>Text Section</th>
<th>Content</th>
<th>Hwk/Assn#</th>
<th>Tentative Problems</th>
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<tbody>
<tr>
<td>lecture</td>
<td>11.4, 11.5</td>
<td>Uniform velocity &amp; acceleration</td>
<td>Hwk3</td>
<td>11.124, 11.141, 11.162</td>
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<tr>
<td>recitation</td>
<td></td>
<td>Introduction to Matlab and numerical solution to ODEs</td>
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<td>11.25, problem posted on Moodle</td>
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<tr>
<td>2, lecture</td>
<td>11.6</td>
<td>Relative/dependent motion</td>
<td>Hwk4</td>
<td>11.47, 11.50, 11.56</td>
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<tr>
<td>lecture</td>
<td>11.9, 11.11, 11.12</td>
<td>Curvilinear motion: rectangular components of velocity &amp; acceleration (Projectile Motion)</td>
<td>Hwk5</td>
<td>In P11.98 also calculate max. vertical distance of ball from incline</td>
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<tr>
<td>recitation</td>
<td></td>
<td>Solution projectile motion with air drag (Matlab)</td>
<td>Asn. 1</td>
<td>11.25, problem posted on Moodle</td>
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<td>3, lecture</td>
<td>12.1-12.6</td>
<td>Kinetics of Particles: Newton’s second law</td>
<td>Hwk7</td>
<td>12.7, 12.11, 12.15</td>
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<td>lecture</td>
<td>12.1-12.6</td>
<td>Kinetics of Particles: Newton’s second law, Equations of motion (contd.)</td>
<td>Hwk9</td>
<td>12.14, 12.69, 12.73</td>
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<td>recitation</td>
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<td>Numerical simulation of dynamic motion of a system of particles (Matlab)</td>
<td>Asn. 2</td>
<td>12C1, 12C3</td>
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<td>12.1-12.6</td>
<td>Kinetics of Particles: Newton’s second law, Equations of motion (contd.)</td>
<td>Hwk10</td>
<td>12.11, 12.14, 12.18</td>
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<tr>
<td>lecture</td>
<td>13.3-13.5</td>
<td>Principle of Work and Energy (contd.), conservation of energy</td>
<td>Hwk12</td>
<td>13.59, 13.60</td>
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<tr>
<td>lecture</td>
<td>13.6-13.8</td>
<td>Work, kinetic energy, potential energy, power, efficiency, Principle of Work and Energy</td>
<td>Hwk13</td>
<td>13.21, 13.23</td>
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<tr>
<td>recitation</td>
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<td>Numerical simulation of work-energy for particles in motion (Matlab)</td>
<td>Asn 3</td>
<td>13.23, 13.24</td>
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<tr>
<td>6, lecture</td>
<td>13.6-13.8</td>
<td>Conservation of energy (contd.)</td>
<td>Hwk14</td>
<td>13.123, 13.132, 13.139</td>
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<tr>
<td>lecture</td>
<td>14.1-14.6</td>
<td>Concept of summation: Newton’s law, energy,</td>
<td>Hwk17</td>
<td>14.5, 14.6, 14.23</td>
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<tr>
<td>lecture</td>
<td>14.1-14.6</td>
<td>and momentum for a system of particles</td>
<td>Hwk18</td>
<td>14.45, 14.52</td>
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<tr>
<td>recitation</td>
<td></td>
<td>Numerical simulation of impact between randomly colliding particles (Matlab)</td>
<td>Asn 4</td>
<td>Problems posted on Moodle</td>
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<tr>
<td>8, lecture</td>
<td>15.1-15.4</td>
<td>Rigid body: translation &amp; fixed axis rotation</td>
<td>Hwk19</td>
<td>15.5, 15.10</td>
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<tr>
<td>Week #</td>
<td>Lecture</td>
<td>Recitation</td>
<td>Text Section</td>
<td>Content</td>
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<tr>
<td>9, lecture</td>
<td>Planar motion, absolute &amp; relative motion</td>
<td>Introduction to Maple</td>
<td>15.5, 15.6</td>
<td>Hwk20</td>
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<tr>
<td>9, lecture</td>
<td>Planar motion, absolute &amp; relative motion (cont'd.)</td>
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<td>15.5, 15.6</td>
<td>Hwk21</td>
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<td>10, lecture</td>
<td></td>
<td></td>
<td>15.7</td>
<td>Hwk22</td>
</tr>
<tr>
<td>11, lecture</td>
<td>Numerical simulation of kinematic motion of a system of rigid bodies (Velocities)(Matlab)</td>
<td>Assn 6</td>
<td>16.1-16.3 Quiz (5)</td>
<td>Hwk23</td>
</tr>
<tr>
<td>11, lecture</td>
<td>Equations of motion &amp; momentum of rigid bodies</td>
<td>Assn 5</td>
<td>16.1-16.3</td>
<td>Hwk24</td>
</tr>
<tr>
<td>11, lecture</td>
<td>Equations of motion for rigid bodies (contd.)</td>
<td></td>
<td>16.1</td>
<td>Hwk25</td>
</tr>
<tr>
<td>11, lecture</td>
<td>Numerical simulation of kinematic motion of a system of rigid bodies (Accln.) (Matlab)</td>
<td></td>
<td>16.4</td>
<td>Hwk26</td>
</tr>
<tr>
<td>11, lecture</td>
<td>d'Alembert's principle for rigid bodies</td>
<td></td>
<td>16.4</td>
<td>Hwk27</td>
</tr>
<tr>
<td>11, lecture</td>
<td>d'Alembert's principle for rigid bodies (contd.)</td>
<td></td>
<td>16.8</td>
<td>Hwk28</td>
</tr>
<tr>
<td>12, lecture</td>
<td>Constrained plane motion</td>
<td></td>
<td>16.8</td>
<td></td>
</tr>
<tr>
<td>12, lecture</td>
<td>Numerical simulation of kinetic motion of a system of rigid bodies(Maple+Matlab)</td>
<td></td>
<td>16.9</td>
<td></td>
</tr>
<tr>
<td>13, lecture</td>
<td>Principle of work &amp; energy for rigid bodies</td>
<td></td>
<td>17.1-17.5</td>
<td>Hwk29</td>
</tr>
<tr>
<td>13, lecture</td>
<td>Conservation of energy for rigid bodies</td>
<td></td>
<td>17.5, 17.6</td>
<td>Hwk30</td>
</tr>
<tr>
<td>14, lecture</td>
<td>Rigid body vibration (using kinetics)</td>
<td></td>
<td>19.5, 19.6</td>
<td>Hwk32</td>
</tr>
<tr>
<td>14, lecture</td>
<td>Numerical simulation of free vibration of rigid body undergoing (non simple) harmonic motion (Maple+Matlab)</td>
<td></td>
<td></td>
<td>Assn 8</td>
</tr>
<tr>
<td>14, lecture</td>
<td>Forced vibrations</td>
<td></td>
<td>19.7</td>
<td>Hwk33</td>
</tr>
</tbody>
</table>

**Comprehensive Exam Review**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Recitation</th>
<th>Homework</th>
<th>Tentative Homework Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>15, Final Exam</td>
<td>Numerical simulation of forced vibration of rigid body undergoing (non simple) harmonic motion (Maple+Matlab)</td>
<td>Assn 8</td>
<td>Comprehensive</td>
</tr>
</tbody>
</table>
At their October 15th, 2013 meeting, the Faculty Senate Courses and Curriculum Committee took the following actions regarding the CE proposals.

**CE CURRICULUM**
- The Committee approved the changes to the CE curriculum.

**CE 2451, 2461, AND 3401**
- The Committee returned the proposals to add CE 2451, 2461, and 3401. The lab/recitation format of these HONORS courses increases the total credit hours to 4, not the proposed 3 credit hours. The Committee believes these courses to be **four** credit hour courses. The department may also opt to drop a lecture hour from each course to keep the proposed three credit hour.

**CE 2450, 2460, and 3400**
- The Committee tabled these proposals pending the submission and approval of their HONORS counterparts.

Please submit the requested documentation to Anna Castrillo in the Office of the University Registrar at 112 Thomas Boyd Hall or by email at acastr1@lsu.edu.

If you have any questions regarding the request, please feel free to contact me at lrouse@lsu.edu.
2. For the CE HONORS courses, are they lecture/lab courses or lecture/recitation courses?

Lecture Recitation
REQUEST FOR ADDITION OF NEW COURSE

Department: Civil Engineering
College: Engineering
Date: 9-12-11

PROPOSED COURSE
Rubric & No.: CE2451
Title: HONORS: Statics

COURSE CREDIT
Graduate Credit: YES x NO (complete for 4000 level courses only)
Semester Hours of Credit: 
(For "Lecture/Lab" type courses only: Lecture Hrs. 
If course may be repeated for credit (i.e. special topics), course may be taken for a max. of credit hours.
Credit will not be given for this course and: CE 2450

GRADING
Final Exam: x YES NO Grading System: x Letter Grade Pass/Fail
(Attach justification if the proposed course will not hold a final exam during examination week.)

COURSE TYPE
Check one type: LEC LAB LEC/LAB X SEM CLIN/PRACT RES/IND
Maximum enrollment per section: 35
Total weekly contact hours: 
(If lecture/lab, contact hours of: 

CATALOG TEXT
(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)
2451 HONORS: Statics (4) Prereq.: grade of "C" or better in MATH 1550, 1552 and PHYS 211C. Credit will not be given for both this course and CE 2450. Vectorial treatment of resultants and equilibrium of force systems, centroids and centers of gravity, fluid statics, friction.

BUDGET IMPACT
If this course is approved, will additional staff be needed? 
Will additional space, equipment, special library materials or other major expense be involved? 
(If answer to either question above is "yes" attach explanation.)

ATTACHMENTS
ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 10-17-11
College Faculty Approval 9/19/13

Department Chair's Signature 9/27/13
College Dean's Signature 9/29/13
Graduate Dean's Signature (for 4000 level and above) 6/18/2014
Chair, FS C&C Committee 6/20/19

Academic Affairs Approval
Justification of CE 2451 – Honors Statics

The Department of Civil and Environmental Engineering proposes the creation of a new course, CE 2451: Honors Statics.

Statics is the study of the effect of forces on rigid bodies in equilibrium. It introduces the use of the principles of equilibrium to determine unknown forces from known forces. More fundamentally, it introduces the approach to solving engineering mechanics problems: identify a sub-system of focus from the original system, represent the forces acting on the subsystem, combine these forces, and study the effects.

Statics provides a foundation for engineering design. Subsequently it is required by seven of the nine engineering degree programs offered by LSU’s College of Engineering. As a result, more than 300 students are enrolled in statics each semester. Creation of an honors course in statics will provide a great number of engineering students enrolled in the Honors College an engineering course that will apply toward both their degree and their honors requirements.

In addition, the LSU Honors College seeks to promote academic excellence, foster community and develop leadership among students. This course will promote all three by the addition of weekly Peer-Led Team Learning (PLTL) workshops.

CE 2450, Statics, is delivered in three hours of lecture each week. CE 2451, Honors Statics, proposes the addition of weekly Peer-Led Team Learning (PLTL) Workshops to the traditional lecture format. Students in CE 2451 will attend three hours of lecture and a 2-hour collaborative learning workshop each week. During these workshops students work in teams of six to eight on challenging problems related to material covered in that week’s lecture. Workshops are led by specially trained peer leaders who guide each team’s efforts by keeping all team members engaged with the material and each other by encouraging debate and discussion.

PLTL facilitates student understanding by requiring students to work as a team to obtain a common goal. Each team member must be able to articulate his or her ideas, requiring a thorough understanding of the material. In addition they must comprehend the ideas offered by their teammates, analyze them and evaluate their validity. Students also benefit from the different learning styles of their teammates as they are exposed to alternative approaches to solving the problems. Students become a learning community that continues beyond the confines of the course.

Peer leaders are recruited from students who have completed the course, done well, and demonstrate an eagerness to help their classmates. Since team leaders are chosen from previous classes, students in CE 2451 may serve as peer leaders for later classes. Students who become peer leaders benefit from an increased understanding of the subject matter, increased confidence, an appreciation of learning types, and improved soft skills.

In conclusion, the creation of a new Honors Statics course that adds PLTL at weekly collaborative learning workshops to the lecture format of a traditional statics class will offer students a variety of skills that will help them throughout their collegiate career and beyond.
Syllabus

LSU Department of Civil and Environmental Engineering
CE 2451: Honors Statics

Instructor:
Office Hours:

Peer Leaders:


Other Required Materials: 4 – Full-size Bluebooks & 4 – Full-size Scantron sheets.
Place one unmarked Scantron sheet in each bluebook, write your name on the back of each Bluebook and turn into me by the last day to add classes.

Course Prerequisites: C or better in MATH 1550, MATH 1552 & PHYS 2.C

Course purpose: Statics is the study of the effect of forces on rigid bodies in equilibrium. It introduces the use of the principles of equilibrium to determine unknown forces from known forces. More fundamentally, it introduces the approach to solving engineering mechanics problems: identify a subsystem of focus from the original system, represent the forces acting on the subsystem, combine these forces, and study the effects.

Course Objectives: By the end of the course, you should be able to do the following things:
• Reason about physical systems. Recognize distinct parts making up a system, discern how they are connected to one another.
• Translate the interactions between parts of a system into the symbols and variables of statics. Forces are always in equal and opposite pairs acting between bodies, which are usually in contact; distinctions must be drawn between a force, a moment due to a force about a point, and a couple; two combinations of forces and couples are statically equivalent to one another if they have the same net force and moment; the possibilities of forces between bodies that are connected to, or contact, one another can be reduced by virtue of the bodies themselves, the geometry of the connection and/or assumptions on friction.
• Derive meaningful relations between the variables based on the principle of equilibrium. Equilibrium conditions always pertain to the external forces acting directly on a chosen body; a body is in equilibrium if the summation of forces on it is zero and the summation of moments on it is zero.
• Carry out the mathematical operations. Resolving or combining forces; finding moments due to forces.
CE 2451: Statics

Policies and procedures

- **Academic integrity.** Students should refer to the University policy on academic integrity found in the Code of Student Conduct, (http://saa.lsu.edu/Code%20of%20Student%20Conduct%20August%2009.pf). It is the instructors understanding and expectation that the student's signature on any test or assignment means that the students contributed to the assignment in question (if a group assignment) and that they neither gave nor received unauthorized aid (if an individual assignment). Authorized aid on an individual assignment includes discussing the interpretation of the problem statement, sharing ideas or approaches for solving the problem, and explaining concepts involved in the problem. Any other aid would be unauthorized and a violation of the academic integrity policy. Examples of academic misconduct are, but not limited to copying, using unauthorized materials during a quiz or exam, submitting work of another or providing work to another student for copying, misrepresenting identity, and attempting to commit an act of academic misconduct. All cases of academic misconduct will be submitted to the Office of Judicial Affairs (OJA). If you are found guilty of academic misconduct in the course you will receive an F for the course and other sanctions as determined by OJA.

- **Homework.** Students will be assigned homework each lecture period from the textbook. Assignments are due at the beginning of the next lecture and should be submitted on Mastering Engineering (ME).

- **Homework format.** For written assignments, use engineering paper (available in the bookstore), one side of each page (clear side, not grid side); begin each problem on a new page; and box all final answers. The problems should be submitted in the same order as the assignment. Staple the pages and fold them vertically with the fold on the left hand side when you hand them in. Put your name and the problem set number (individual assignments) or the names and problem set number (team assignment) on the outside. If a students name appears on a solution set, it certifies that he/she has participated in solving the problems. In order to encourage you to follow the instructions given above, standard point deductions will be assigned for not stapling, no name, etc.

- **Late homework.** Completed assignments should be turned in at the beginning of the class period. Late homework will only be accepted under the instructor's discretion and documentation of an excuse may be required.

- **Posted solutions.** Homework solutions will be posted on Moodle once the assignment has been collected.

- **Exams.** There will be three exams during the semester and a comprehensive final exam. Tests will be given as a common exam on scheduled Mondays from 4-5PM (see detailed course schedule for dates and locations). Students who are unable to take the test at those times (with a documented excuse) will schedule an alternate time to take the exam.

- **Test and homework grading.** If you believe that an error was made in grading the homework, you should write a short justification of your claim and attach it to the original assignment. Return the assignment and the justification (stapled together) to your instructor. The "statute of limitations" for submitting such claims is one week after the assignment is returned.

- **Workshops.** The collaborative learning workshop will be held during class time on Friday. Instructors will designate teams of 6-8 who will work as a team to solve problems related to course material covered that week. Attendance is mandatory. Any student who misses more than two workshops will receive a grade of zero for workshop (20% of your grade).

- **Attendance.** Students who miss class due to an excused absence should work with the instructor or peer leader to make up any missed work. Documented excuses should be presented to the instructor.
• Calculation of course grade. A weighted average will be computed as follows:
  - Exams (3) = 55%
  - Final Examination = 30%
  - Homework = 10%
  - Workshop = 5%

The lowest test grade counts half as much as the other two (lowest exam counts 8%, other two count 16%). The homework and exercise grades will only count if the average grade on class exams and the final exam is 60 or above – in other words, if you can’t pass the individual tests, then you can’t pass the course.

The course grades will be determined as follows:
  - > 90% A
  - 89.9 – 80% B
  - 79.9 – 65% C
  - 64.9 – 60% D
  - < 59.9% F

Note: We do not curve grades in this course. It is theoretically possible for everyone in the class to get an A (or an F). Your performance depends only on how you do, not on how everyone else in the class does. It is therefore in your best interests to help your classmates, while acting within the bounds of the stated academic integrity policy.

Important Note: Students will require a minimum of 2-4 hours of study/homework outside of class for every 50-minutes of lecture to adequately prepare for the next class.

• Instructor’s commitment. You can expect your instructors to be courteous, punctual, well-organized, and prepared for lecture and other class activities; to answer questions clearly; to be available during office hours or to notify you beforehand if they are unable to keep them; to provide a suitable guest lecturer when they are traveling; and to grade uniformly and consistently according to the posted guidelines.

• Consulting with faculty. We strongly encourage you to discuss academic or personal questions with the instructor during their office hours or by email.

• Students with disabilities. Any student who has been tested eligible for extra time on exams/quizzes by the Office of Disability Services (ODS) must take their exams/quizzes at ODS and comply with the ODS’s rules and time schedules. Students will not be given extra time if they take exams with the regular class (See instructor for details as well as: www.lsu.edu/disability)
Course Topics

Introduction to Statics
Vector Math: Addition and Subtraction
Resultant Forces
Rectangular Components of a Force
Forces Written as Cartesian Vectors
Direction Angles
Vector Math: Dot Product
Equilibrium of a Concurrent Force System
Vector Math: Cross Products
Moment of a Force About a Point
Vector Math: Mixed Triple Product
Moment of a Force About a Line
Couples
Equivalent Force – Couple system
Distributed Load
Non-concurrent Equilibrium
Supports
Two Force and Three Force Members
Proper & Improper supports
Analyzing a Truss by the Method of Joints
Analyzing a Truss by the Method of Sections
Analyzing Rigid & Non-rigid Frames
Analyzing Machines
Determining Centroids of Areas and Lines
Pappus-Guldinus theorems
Analyzing Hydrostatic Structures
Moment of Inertia
Product of inertia
Friction
From: Lawrence Rouse, Chair, Courses and Curricula Committee

At their October 15th, 2013 meeting, the Faculty Senate Courses and Curriculum Committee took the following actions regarding the CE proposals.

CE CURRICULUM

• The Committee approved the changes to the CE curriculum.

CE 2451, 2461, AND 3401

• The Committee returned the proposals to add CE 2451, 2461, and 3401. The lab/recitation format of these HONORS courses increases the total credit hours to 4, not the proposed 3 credit hours. The Committee believes these courses to be four credit hour courses. The department may also opt to drop a lecture hour from each course to keep the proposed three credit hour.

CE 2450, 2460, and 3400

• The Committee tabled these proposals pending the submission and approval of their HONORS counterparts.

Please submit the requested documentation to Anna Castrillo in the Office of the University Registrar at 112 Thomas Boyd Hall or by email at acastrl@lsu.edu.

If you have any questions regarding the request, please feel free to contact me at lrouse@lsu.edu.
The workshop is a recitation with active learning strategies....
So yes, make all three recitations....

W

I just want to make sure.

I see that the first course Statics states that the format is three hours lecture and two hours of collaborative learning workshops. The other two courses state lecture/recitation. But the first one seems to be a lecture/lab. I will change it to lecture/recitation, if that is what it should be.

Anna Castrillo, M.A.
Coordinator
Office of the University Registrar
Louisiana State University
112 Thomas Boyd Hall
Phone: (225)578-4111
Fax: (225)578-5991

From: Warren Waggenspack
Sent: Wednesday, June 18, 2014 9:16 AM
To: Anna M Castrillo; Gerald M Knapp
Subject: CE courses

2. For the CE HONORS courses, are they lecture/lab courses or lecture/recitation courses?
REQUEST FOR ADDITION OF NEW COURSE

Department: Mechanical & Industrial Engineering  Date: 1/10/14

College: Engineering

PROPOSED COURSE

Short Title: Ecommerce Engineering II

Rubric & No: IE4428

Title: Ecommerce Engineering II

COURSE CREDIT

Graduate Credit: X YES  NO

Semester Hours of Credit: 3

(For combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ______ credit hours.

Credit will not be given for this course and:

(Indicate rubrics and course numbers)

GRADING

Final Exam: X YES  NO

Grading System: X Letter Grade  Pass/Fail

(Catalog statement exactly as you wish it to appear in the LSU General Catalog)

Prerequisite: IE4427: lecture 2 hrs., lab 3 hrs. Continued coverage of business processes underlying modern commerce and supply chain systems, and the information technologies used to implement them.

BUDGET IMPACT

If this course is approved, will additional staff be needed? YES  X  NO

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

If answer to either question above is “yes” attach explanation.

ATTACHMENTS

ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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  1/10/14

College Faculty Approval  1/18/121

Chair, FS C&C Committee  5/3/14

Graduate Dean’s Signature (for 4000 level and above)  6-11-14

College Contact:  

(Please print name)
JUSTIFICATION
This course will be a core course in the proposed Ecommerce Engineering minor. Please see accompanying Form F for justification, and Form A for IE4427 prerequisite.
Justification

E-commerce, in the form of business-to-consumer or business-to-business commerce, now makes up the majority of commerce in the U.S. Technologies and business practices have evolved rapidly in E-commerce, and there is a high demand for employees with expertise in these systems. The purpose of this minor is to familiarize technically-oriented students with business processes and strategic issues underlying E-commerce systems, and to develop a mastery of the design, development, and implementation of E-commerce software systems.

The primary market for the minor is expected to be students in Computer Science, EE & Computer Engineering, Industrial Engineering, and ISDS.

This minor is supportive of the state economic development initiatives in information technologies, and has been developed in collaboration with representatives from IBM and other local and regional information technology companies, who will be supporting the minor’s implementation through provision of software, case studies, guest lectures, and donations.

Pre co-requisite relations between the minor courses are shown below.

### Initial Elective List (list will be maintained by the Department of Mechanical and Industrial Engineering)

- IE 4466 Human Computer Interaction
- CSC 4343 Interfaces Design & Technology
- ISDS 4141 Intro to Data Mining
- ISDS 4161 Sourcing in China

The minor is not initially expected to require additional faculty resources. The department chair has agreed to offering the core minor courses regularly using current faculty. The College has included this area in its hiring plan, and is seeking to make hires in this area as funding becomes available, which will address any ongoing growth in enrollment. The College of Engineering has provided 6 months of summer salary in Summer 2014 to Dr. Knapp to develop the lab curriculum for the two new courses, IE 4427 and 4428.
IE4428 ECommerce Engineering II (Spring 2015)

Course notes book will be provided electronically on Moodle.

DESCRIPTION: Prerequisite: IE4427: lecture 2 hrs., lab 3 hrs. This course continues from Ecommerce Engineering I, a focus on developing a detailed understanding of the business processes underlying modern commerce and supply chain systems, and the information technologies used to implement them. For each process, typical operations are covered along with alternatives and exceptions/ issues which may need to be considered, and industry case studies. Labs focus on practical implementation, first on related Enterprise Resource Planning (ERP) system functionality from the user’s perspective, and then in business integration technologies relating to commerce systems.

COURSE OBJECTIVES: Students completing this course are expected to be able to:
1. Demonstrate an understanding of commerce and supply chain related payment, shipping transportation, call center, and global commerce business processes, their complexities, and the information systems interfaces and technologies for implementing them.
2. Use an ERP system to perform transactions relating to these commerce business processes.
3. Create a portal system for tracking business process metrics.
4. Develop and implement a simple tiered Ecommerce system software solution using business integration technologies, including web services, web service orchestration and service bus, BPM, and data integration.

TOPICS

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Payment Processes: Credit card payment system, clearing houses, ACH network, merchant banks, credit/debit card payments, PayPal and similar payment services</td>
<td>Payment Gateway APIs: Process purchase authorization, refund (development mode), Setup mobile payment system</td>
</tr>
<tr>
<td>3</td>
<td>Shipping Transportation: Shipping models, alternatives, options - parcel shipments, zone skipping, etc</td>
<td>Carrier APIs: Using FedEx or UPS APIs (development model) to request pickup and get tracking number of label, track delivery status and display (formatted) on website</td>
</tr>
<tr>
<td>4</td>
<td>Shipping Transportation: International shipping options, issues, costs, Delivery, Metrics</td>
<td>Case Study Problem: International container shipping &amp; customs</td>
</tr>
<tr>
<td>5</td>
<td>Call Center: Call tracking monitoring, Call analytics, CRM,</td>
<td>Call Center Technologies - Tour, demos, or case study.</td>
</tr>
<tr>
<td>6</td>
<td>Global International Commerce: Internationalization, Payments, Addresses, Names etc.; Taxes</td>
<td>Global Commerce Case Study Problem</td>
</tr>
<tr>
<td>7</td>
<td>Commerce &amp; Supply Chain Integration Technologies: Overview, Portal services: Concepts, capabilities, and major commercial systems, Portlets, and portlet standards</td>
<td>SharePoint (or similar) and portals, portlets development</td>
</tr>
<tr>
<td>8</td>
<td>Review: MIDTERM.</td>
<td>SharePoint (or similar) and portals, portlets development.</td>
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<tr>
<td>11</td>
<td><strong>Enterprise service buses</strong>: Application servers; Web service directory services; Message queues; message broker services.</td>
<td>Web Service Orchestration &amp; Service Bus Technologies.</td>
</tr>
<tr>
<td>12</td>
<td><strong>Enterprise service buses</strong>: Transformation services; Transaction services.</td>
<td>Web Service Orchestration &amp; Service Bus Technologies.</td>
</tr>
<tr>
<td>14</td>
<td><strong>Data integration (cross ERP - Info Sys integration &amp; warehouse integration)</strong>: Extract, Transform, Load (ETL) concepts; Synchronization replication issues. <strong>Wrap-up and Review</strong>.</td>
<td>Term Project Presentations.</td>
</tr>
</tbody>
</table>

**COURSE POLICIES**

**EVALUATION:**
- Midterm exam 25%
- Final exam 30%
- Semester project 25%
- Pop quizzes & Homework 20%
- Homeworks & Lab Problems 100%

**GRADING:** $0 \leq F \leq 60 \leq D < 70 \leq C < 80 \leq B < 90 \leq A \leq 100$.

**HOMEWORKS & LAB PROBLEMS**
- All assignments must be turned in at the beginning of the class period in which they are due. Late homework & labs will receive a penalty of 20 points (out of 100) for each day overdue, and will not be accepted after solutions are posted.
- Assignments must be printed or neatly written, and stapled or otherwise properly bound (no dog-tagged or paper-clipped assignments will be accepted).
- Most assignments will have a digital component (code or electronic document submission). A Moodle dropbox will be used for these submissions. All documents for an assignment should be zipped into a single file for submission. Include your PAWS ID in the zip file name (e.g., "gknapp_hw1.zip").
SEMESTER PROJECT:
Each student will participate in a team in developing a multi-vendor e-Commerce store-front site. Typical requirements may be found below: detailed requirements will be distributed shortly after the start of the semester. We may have problems presented from industry; students are also welcome to propose problems of similar scope and coverage to the one below.

Teams may include up to 3 people; be cautioned that I expect all members to contribute equally to both technical development (coding) and reports/presentations, sometimes difficult with larger groups. Dates for project technical proposal, design report, final report, and presentation will be announced early in the semester. Requirements for each report will also be discussed in-class near the start of the semester. Late reports will not be accepted, and will be assigned a zero.

Note: Graduate students will be expected to take on semester projects (aspects of projects if in mixed teams) which are significantly more difficult than undergraduate projects.

Term project topics will vary from semester to semester, and an effort will be made to incorporate industry-based or at least realistic industry-type projects. The following description is typical of the type and scale of projects expected for this course:

Students will develop the service-based architecture for a distributor. The distributor handles storing product, picking, and shipping orders for other companies and does not have its own store-front. High level requirements include:

- Develop external facing EDI-related web services for receiving orders and handling external order management functions
  - Inventory query
  - Order placement
  - Order cancellation
  - Order status change notifications
- Develop internal web-services & workflow (BPM) architecture for inventory and order management
  - Product receiving
  - Product return
  - Order pick
  - Ship
- Shipping Carrier interface
  - Place pickup order & generate tracking info
- Create portal for inventory and order analytics

Term projects will have the following requirements. Percentages indicate percentage of total term project grade.

Proposal – Project Selection & Team Statement (5%)
- Due *** Brief description of project to be performed and list of team members.

Design Report (15%)
- Due *** (mid-semester). This document must include a summary of objectives and specifications/requirements for the software (including use case diagrams and descriptions); prototype user-interface designs; and pseudo-code or diagrams detailing logic of all processes.
- Use Word for the report. You must use named styles for all text and headings, and include a table of contents. All figures and tables are to be captioned and referenced/explained in text. External sources are to be properly cited.
- Use Visio for flow diagrams and other diagrammatic figures.
- Additional format & writing guidelines for this report will be provided early in the semester.
- Assessment will be based both on technical content AND professional presentation (grammar, spelling, format, conciseness, clarity, etc).

**Final Presentation (10%)**
- Each team must make an approximately 10 minute oral presentation to the class on their project during the last lab of the semester.
- Assessment will be based on professionalism of presentation; guidelines will be provided later in the semester.

**Final Report & Program (70%)**
- Due ***, you must deliver and demo a completely debugged and well documented code solution for the problem, and submit your final report for the project.
- Final report:
  - The final report follows the same structure and formatting requirements of the design report but includes updates for all modifications made in the design during implementation, and discussion of usability and testing performed and improvements made as a result.
  - Assessment will be based both on technical content AND professional presentation (grammar, spelling, format, conciseness, clarity, etc.).
  - Students must submit the graded design report along with the final report. If you have addressed the comments in the design report, you can improve your design report grade.
- Final code:
  - Code will be assessed on correctness and completeness (against requirements), quality (appropriate approaches used, code well written, properly commented, error handling and validation), and usability.

**EXAMS & QUIZZES:**
A one-hour midterm exam will be administered during a lecture period (tentatively, ***). A comprehensive final exam will be given during finals week, on ***. Quizzes may be given in any lecture or lab period without notice; be sure to keep up with all reading assigned. Only basic calculators are allowed in exams or quizzes, and only if needed. Laptops, cell devices, PDA's, calculators with infrared ports or cellular/wireless/Bluetooth communications, MP3/music players, and similar devices are prohibited.

Missed exams and quizzes will be assigned a grade of 0 unless a legitimate (university-recognized) reason for absence is presented. In the case of legitimately missed exams or quizzes, no make-ups will be given; your other course grades will be re-weighted at the professor’s discretion.
Dr. Knapp and Dr. Waggenspack,

This email should be enough. I will also attach the justification from the minor to the two new course proposals.

Thanks much!

Anna Castrillo, M.A.
Coordinator
Office of the University Registrar
Louisiana State University
112 Thomas Boyd Hall
Phone: (225)578-4111
Fax: (225)578-5991

-----Original Message-----
From: Warren N Waggenspack
Sent: Wednesday, May 28, 2014 5:32 PM
To: Anna M Castrillo
Cc: Gerald M Knapp; Warren N Waggenspack
Subject: Re: Updated E-Commerce Forms w/ Signatures

Anna
Gerry is correct; however, if for archival purposes, the course forms are filed separately, I would suggest attaching a copy of the justification/description with the Form F as it sufficiently addresses your questions.

Thanks
Warren

On 5/28/14 4:27 PM, "Gerald M Knapp" <gknapp@lsu.edu> wrote:

>Hi Anna,
>With respect to your request on the justifications for IE4427 and
>IE4428, the justification (why needed) is explained in the Ecommerce
>Minor Form F (which is referenced in the IE4427/4428 forms). What the
>courses are about is I think quite clearly described in the course
>descriptions and syllabi.
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>two courses. Both CSC and ISDS reviewed not just the minor form but
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> courses due to the prerequisite chain. The College of Engineering Dean
> has committed
> 1.5 months of salary to me this summer to do the initial curriculum
> development that would typically be done within the context of a
> special topics course. This commitment is noted in the Ecommerce minor Form F.
> Please let me know if the above explanation is sufficient, or if
> additional information is needed, and also whether this email if
> sufficient response or if it will be necessary to redo and re-sign the
> course forms.
> Thank you!
> Regards,
> Dr. Gerry Knapp
>

>-----Original Message-----
>>From: Anna M Castrillo
>>Sent: Wednesday, May 28, 2014 11:32 AM
>>To: Tira D Ishikawa
>>Subject: RE: Updated E-Commerce Forms w/ Signatures
>>
>>Tira,
>>
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>>
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>>should explain what these new courses are about, what do they add to
>>the minor that no other course can, if they have ever been offered as
>>special topics courses in the past, etc.
>>
>>Sincerely,
>>Anna Castrillo, M.A.
>>Coordinator
>>Office of the University Registrar
>>Louisiana State University
>>112 Thomas Boyd Hall
>>Phone: (225)578-4111
>>Fax: (225)578-5991
REQUEST FOR ADDITION OF NEW COURSE

Department: Mechanical & Industrial Engineering Date: 1/10/14
College: Engineering

PROPOSED COURSE
Short Title: Ecommerce Engineering
Rubric & No.: IE4427
Title: Ecommerce Engineering

COURSE CREDIT
Graduate Credit: X YES _ NO
Semester Hours of Credit: 3
(FOR combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.
If course may be repeated for credit (i.e. special topics)
course may be taken for a max. of __________ credit hours.
Credit will not be given for this course and:

GRADING Final Exam: X YES _ NO Grading System: X Letter Grade _ Pass/Fail
(Attach justification if the proposed course will not hold a final exam during examination week.)

COURSE TYPE (Indicate hours in the appropriate course type)

<table>
<thead>
<tr>
<th>LEC/REC</th>
<th>LEC/SEM</th>
<th>LEC</th>
<th>LAB</th>
<th>2/3</th>
<th>LEC/LAB</th>
<th>SEM</th>
<th>CLIN PRACT</th>
<th>RES/IND</th>
</tr>
</thead>
</table>

Maximum enrollment per section: 30 (use integer. eg. 25 not 20-30)

CATALOG TEXT (Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

Prerequisite: IE4425 or CSC4402 or ISDS3110, and credit or registration in IE4426; lecture 2 hrs. lab 3 hrs. Business processes underlying modern commerce and supply chain systems, and the information technologies used to implement them.

BUDGET IMPACT
If this course is approved, will additional staff be needed? X YES _ NO
Will additional space, equipment, special library materials or other major expense be involved? X YES _ NO
(If answer to either question above is "yes" attach explanation.)
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 curricula. 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 1/10/14
College Faculty Approval 7/18/14

Graduate Dean's Signature (for 4000 level and above): __________________________ Date: 6/11/14

College Contact: __________________________ (Please print name)
College Contact E-mail: __________________________

Chair FS C&C Committee 5/29/14
Academic Affairs Approval 6/20/14
JUSTIFICATION
This course will be a core course in the proposed Ecommerce Engineering Minor.
Please see accompanying Form F for justification.
Justification

E-commerce, in the form of business-to-consumer or business-to-business commerce, now makes up the majority of commerce in the U.S. Technologies and business practices have evolved rapidly in E-commerce, and there is a high demand for employees with expertise in these systems. The purpose of this minor is to familiarize technically-oriented students with the business processes and strategic issues underlying E-commerce systems, and to develop a mastery of the design, development, and implementation of E-commerce software systems.

The primary market for the minor is expected to be students in Computer Science, EE & Computer Engineering, Industrial Engineering, and ISDS.

This minor is supportive of the state economic development initiatives in information technologies, and has been developed in collaboration with representatives from IBM and other local and regional information technology companies, who will be supporting the minor's implementation through provision of software, case studies, guest lectures, and donations.

Pre co-requisite relations between the minor courses are shown below.

Initial Elective List (list will be maintained by the Department of Mechanical and Industrial Engineering)

- II-4466 Human Computer Interaction
- CSC4343 Interfaces Design & Technology
- ISDS4141 Intro to Data Mining
- ISDS4161 Sourcing in China

The minor is not initially expected to require additional faculty resources. The department chair has agreed to offering the core minor courses regularly using current faculty. The College has included this area in its hiring plan, and is seeking to make hires in this area as funding becomes available, which will address any ongoing growth in enrollment. The College of Engineering has provided 1.5 months of summer salary in Summer 2014 to Dr. Knapp to develop the lab curriculum for the two new courses, II-4427 and 4428.
IE4427 ECommerce Engineering I (Fall 2014)
Credit hours: 3 (2 ch lee / 1 ch lab)
Weekly contact hours: 2 hrs lee, 3 hrs lab

INSTRUCTOR: Dr. Gerald M. Knapp, 2159B PET
Phone: 578-5374; E-mail: gknapp@lsu.edu
Course website: Moodle

TEXT: Course notes book will be provided electronically on Moodle.

DESCRIPTION: Prerequisite IE4425 or CSC4402 or ISDS3110 or equivalent, and credit or registration in IE4426: lecture 2 hrs, lab 3 hrs. This course focuses on developing a detailed understanding of the business processes underlying modern commerce and supply chain systems, and the information technologies used to implement them. For each process, typical operations are covered along with alternatives and exceptions/issues which may need to be considered, and industry case studies. Labs focus on practical implementation, first on related Enterprise Resource Planning (ERP) system functionality from the user’s perspective, and then in business integration technologies relating to commerce systems.

COURSE OBJECTIVES: Students completing this course are expected to be able to:
1. Demonstrate an understanding of commerce and supply chain related inventory management, selling, and order management business processes, their complexities, and the information systems interfaces and technologies for implementing them.
2. Use an ERP system to perform transactions relating to these commerce business processes.
3. Query, collect, analyze, and report data from an ERP system on commerce-related business process metrics.
4. Analyze requirements, design high level architectural solutions, and document design for commerce and supply chain software systems.
5. Utilize Identification Technologies (bar code, radio-frequency identification [RFID]) in a Ecommerce software system design & implementation.
6. Utilize well-known Ecommerce application programming interfaces (API’s) in a software system design & implementation.
7. Develop and implement a simple Ecommerce system software solution.

TOPICS

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction; Inventory management processes; Overview of suppliers, customers, supply chains, and inventory systems, communication &amp; visibility needs, bullwhip effect, Inventory levels and policies.</td>
<td>ERP introduction (overview, login, navigation) ERP Inventory functions in ERP, create update warehouse and distribution centers; create update product master data and BOM.</td>
</tr>
<tr>
<td>2</td>
<td>Inventory management processes: Backorders; Reservations &amp; Available to Promise rules; Purchasing &amp; reordering restocking; Receiving &amp;</td>
<td>ERP Inventory functions in ERP, set initial inventory levels for products; set reorder policies; create reorder; process receiving; process return; process reservation.</td>
</tr>
</tbody>
</table>
3 **Inventory management processes:** Distribution between warehouses, distribution centers, fulfillment centers - options and decisions. Inventory - Metrics - Case Studies.

**ERP Inventory functions:** in ERP, Build reports (using report builder) and a consolidated dashboard view (using dashboard designer) of inventory in various locations and across time.

4 **Inventory management processes:** Inventory data identification technologies, Selling processes: Overview of selling processes and sales channels: Product catalog population & maintenance (types, classification, categorization, product attributes, search).

**Inventory identification technologies (barcode, RFID):** Create a simple inventory book mobile app using barcode reading to confirm picks and update inventory database. Use RFID to locate inventory in a physical space.

5 **Selling processes:** Multi-vendor Multi-business catalogs (e.g., AWS MPS), internal external categorization hierarchies. Pricing: Price rules, discounts.

**ERP Selling functions:** in ERP, Create sales distribution channels: Create ERP catalog: Define pricing, price rules, and discounts.

6 **Selling processes:** Product Inquiry, Sales quotes - budgetary or availability quote. Sales campaigns: types, coupons, advertising. Advertising & recommendation systems: Multi-channel selling. Recurring orders - subscription based orders.

**AWS MPS or similar:** Create B2C product catalog.

7 **Selling processes:** Merchandising selling techniques landing pages, featured product categories, other features like ratings reviews, imaging, etc; Search site search, search engine optimization, type-ahead, common search tools (SOLR). Case studies.

8 **Selling processes:** Multi-variate testing; Metrics - checkout funnel, web analytics analysis & optimizations. MIDTERM

**Commerce App Development:** Design and create a simple web-based catalog system application w/ search (starting point for term project).

9 **Commerce system requirements analysis & definition:** Review of documentation tools; Applying lean concepts & analysis: Evaluating robustness, maintainability of alternative solutions; Cost assessment.

**Case Study Analysis:** Perform analysis of web analytic data from catalog site and develop recommendations for improvement.

**Case Study Analysis:** Analyze checkout flow usability and make improvements.


**ERP Order Management functions:** in ERP, Create update orders, view orders, Change order status: Reports.

11 **Order management processes:** Order processing - pick, pack, ship (Fulfillment).

**Commerce API's - AWS Marketplace Services (or similar):**

12 **Order Management processes:** Order status: Returns exchanges & reverse logistics: Controlled technologies: Metrics and reporting.

**Commerce API's - AWS Marketplace Services**

13 **Commerce system requirements analysis & definition:** Case Studies.

**Commerce App Development:** Develop a mechanism to detect cart abandonments and contact customer.

14 **Commerce system requirements analysis & definition:** Case Studies. Wrap-up & review for final.

**TERM PROJECT WORK.**

**Term Project Presentations.**
COURSE POLICIES

EVALUATION:

- Midterm exam: 25%
- Final exam: 30%
- Semester project: 25%
- Quizzes, In-Class Assignments & Homework: 20%

GRADING: 0 ≤ F ≤ 60 ≤ D ≤ 70 ≤ C ≤ 80 ≤ B ≤ 90 ≤ A ≤ 100

WORKLOAD EXPECTATION

Students can expect to spend 6-8 hours a week outside of lectures and lab times on this course.

Work outside of class includes reading, assignments, and term project development.

HOMEWORKS & LAB PROBLEMS

- All assignments must be turned in at the beginning of the class period in which they are due. Late homework & labs will receive a penalty of 20 points (out of 100) for each day overdue, and will not be accepted after solutions are posted.
- Assignments must be printed or neatly written, and stapled or otherwise properly bound (no dog-tagged or paper-clipped assignments will be accepted).
- Most assignments will have a digital component (code or electronic document submission). A Moodle dropbox will be used for these submissions. All documents for an assignment should be zipped into a single file for submission. Include your PAWS ID in the zip file name (e.g., "knapp_hwl.zip").

TERM PROJECT

Each student will participate in a team in developing a multi-vendor e-Commerce store-front site. Typical requirements may be found below; detailed requirements will be distributed shortly after the start of the semester. We may have problems presented from industry; students are also welcome to propose problems of similar scope and coverage to the one below.

Teams may include up to 3 people; be cautioned that I expect all members to contribute equally to both technical development (coding) and reports/presentations, sometimes difficult with larger groups. Dates for project technical proposal, design report, final report, and presentation will be announced early in the semester. Requirements for each report will also be discussed in-class near the start of the semester. Late reports will not be accepted, and will be assigned a zero.

Note: Graduate students will be assigned more complex requirement of greater difficulty than undergraduate projects.

Term project topics will vary from semester to semester, and an effort will be made to incorporate industry-based or at least realistic industry-type projects. The following project description is typical of the type and scale of projects expected for this course:

Students will develop a web-based e-commerce store-front site that may be used by multiple vendors. High level requirements include:

- Front-End (web application supporting both mobile and standard web-based interfaces):
- A common catalog and search system
- A cart system
- A checkout system
  - A (simulated) payment API will be made available
  - Checkout must handle orders that may span multiple vendors
- A customer-facing order management system
- A customer notification system, to notify customers of order changes (receipt, status change, tracking #)

- Back-End (via web services)
  - A supplier notification system, to notify suppliers of orders and order changes
  - An API
    - Uploads and updates to supplier product catalog
    - Uploads and updates to supplier product inventory
    - Order retrieval (supplier gets order details)
    - Order status updates (supplier updates status – cancel, backorder, processing, shipped), including use of identification technologies.

Term projects will have the following graded requirements. Percentages indicate percentage of total term project grade.

**Proposal – Project Selection & Team Statement (5%)**
- **Due ******, Brief description of project to be performed and list of team members.

**Design Report (15%)**
- **Due *** (mid-semester)**. This document must include a summary of objectives and specifications/requirements for the software (including use case diagrams and descriptions); prototype user-interface designs; and pseudo-code or diagrams detailing logic of all processes.
- Use Word for the report. You must use named styles for all text and headings, and include a table of contents. All figures / tables are to be captioned and referenced/explained in text. External sources are to be properly cited.
- Use Visio for flow diagrams and other diagrammatic figures
- Additional format & writing guidelines for this report will be provided early in the semester.
- Assessment will be based both on technical content AND professional presentation (grammar, spelling, format, conciseness, clarity, etc).

**Final Presentation (10%)**
- Each team must make an approximately 10 minute oral presentation to the class on their project **during the last lab of the semester**.
- Assessment will be based on professionalism of presentation; guidelines will be provided later in the semester.

**Final Report & Program (70%)**
- **Due ******, you must deliver and demo a completely debugged and well documented code solution for the problem, and submit your final report for the project.
- Final report:
• The final report follows the same structure and formatting requirements of the design report but includes updates for all modifications made in the design during implementation, and discussion of usability and testing performed and improvements made as a result.

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Thanks much!

Anna Castrillo, M.A.
Coordinator
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Phone: (225)578-4111
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From: Warren N Waggenspack
Sent: Wednesday, May 28, 2014 5:32 PM
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Cc: Gerald M Knapp; Warren N Waggenspack
Subject: Re: Updated E-Commerce Forms w/ Signatures

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Thanks
Warren

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special topics courses in the past, etc.

> Sincerely,

Anna Castrillo, M.A.
Coordinator
Office of the University Registrar
Louisiana State University
112 Thomas Boyd Hall
Phone: (225)578-4111
Fax: (225)578-5991
REQUEST FOR ADDITION OF NEW COURSE

Department: Engineering
College: 

Date: 03/24/14

PROPOSED COURSE

Short Title: AUTONOMOUS VEHICLES
Rubric & No.: ENGR 4200
Title: Autonomous Vehicles

COURSE CREDIT

Graduate Credit: X YES NO

Semester Hours of Credit: 3

(For combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.)

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ____________ credit hours.

Credit will not be given for this course and:

KIN 4200

(Indicate rubrics and course numbers)

GRADING

Final Exam: X YES NO Grading System: x Letter Grade Pass/Fail

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

COURSE TYPE

(Indicate hours in the appropriate course type)

/ LEC/REC / LEC/SEM / LEC / LAB 2/3 LEC/LAB / SEM / CLIN/PRACT / RES/IND

Maximum enrollment per section: 20 (use integer, e.g. 25 not 20-30)

CATALOG TEXT

(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

ENGR 4200 Autonomous Vehicles (3) Also offered as KIN 4200. Prereq.: ENGR/KIN 3100 or equivalent; experience in MATLAB. 2 hrs. lecture; 3 hrs. lab. Vehicle kinematics, motion control, perception, localization, path planning, and navigation.

BUDGET IMPACT

If this course is approved, will additional staff be needed? X YES NO

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

(If answer to either question above is ‘yes’ attach explanation)

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 curricula. 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

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

APPROVALS

Department Faculty Approval 2/24/14

Department Chair’s Signature 6/13/14

College Faculty Approval 4-8-14

College Dean’s Signature 6-11-14

Graduate Dean’s Signature (for 4000 level and above) 6-14-14

College Contact: Warren Waggenspack

(Please print name)

College Contact E-mail: mewagg@lsu.edu

Academic Affairs Approval 6-20-14

Chair, FS C&C Committee 6-28-14

Academic Affairs Approval 6-26-14
Justification

This course is being developed in support of the Robotics Engineering minor, and will expose students to one of the primary application areas for robots, viz., autonomous vehicles. The course is cross-listed as KIN 420 and does not duplicate other courses.

The College of Engineering has committed to providing funds for initial equipment purchase (~$40k) and to starting a fund-raiser to help with subsequent purchases (~$35k). Lab space will also be made available by the College of Engineering.
ENGR 4200 Autonomous Vehicles

CATALOG DESCRIPTION
ENGR 4200 Autonomous Vehicles (3) Prereq.: ENGR/KIN 3100 or equivalent; experience in MATLAB. 2 hrs. lecture; 3 hrs. lab. Vehicle kinematics, motion control, perception, localization, path planning, and navigation.

TEXT

PRE-REQUISITES BY TOPIC
Linear algebra, differential equations, and MATLAB.

COURSE OBJECTIVES
Students who complete this course will have learned: a) the different types of autonomous vehicles, b) the principles of kinematics, motion and trajectory planning, sensing, localization, and control of autonomous vehicles, and c) the different types of actuators and sensors employed by autonomous vehicles.

GRADING POLICY
Midterm exam 25%
Final exam 35%
Lab reports 30%
Homework 10%

Final grade: F < 60 ≤ D < 70 ≤ C < 80 ≤ B < 90 ≤ A.

TOPICS
1. Introduction
   - History of autonomous vehicles
   - Different types of autonomous vehicles
   - Mobile robot workspace
   - Cognitive architectures
   - Matrix algebra review
2. Vehicle Kinematics
   - Kinematic models and constraints
   - Position representation
   - Forward kinematics
   - Maneuverability
   - Motion control
3. Perception
   - Sensor classification
   - Evaluating sensor performance
   - Wheel/motor sensors and odometry
- Representing uncertainty
- Heading sensors
- Gyroscopes
- Accelerometers
- Inertial measurement unit
- Ground beacons
- Laser range finders/LIDAR
- Cameras
- Computer vision

4. Localization
   - Belief representation
   - Map representation
   - Probability/statistics review
   - Probabilistic map-based localization
   - Kalman filter
   - Simultaneous localization and mapping

5. Path Planning and Navigation
   - Line following
   - Path planning
   - Obstacle avoidance
   - Navigation architectures

LAB ASSIGNMENTS
Lab experiments will be conducted in groups of two or three students, and will involve the use of a computer-controlled mobile robot and various sensors (LIDAR, Microsoft Kinetic, and camera). The experiments will allow students to directly apply the concepts learned throughout the lectures to an autonomous ground vehicle. A written report will be submitted at the completion of each experiment by each group.

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction; Matrix algebra review</td>
<td>Hardware/software introduction</td>
</tr>
<tr>
<td>2</td>
<td>Matrix algebra review; Kinematics</td>
<td>Hardware/software introduction</td>
</tr>
<tr>
<td>3</td>
<td>Vehicle Kinematics</td>
<td>Getting data from odometer and error correction</td>
</tr>
<tr>
<td>4</td>
<td>Vehicle Kinematics</td>
<td>Getting data from odometer and error correction</td>
</tr>
<tr>
<td>5</td>
<td>Vehicle Kinematics; Perception</td>
<td>Motor control</td>
</tr>
<tr>
<td>6</td>
<td>Perception</td>
<td>Implementing a rudimentary object tracker</td>
</tr>
<tr>
<td>7</td>
<td>Perception</td>
<td>Implementing a rudimentary object tracker</td>
</tr>
<tr>
<td>8</td>
<td>Midterm exam; Perception</td>
<td>Combining depth information with tracking</td>
</tr>
<tr>
<td>9</td>
<td>Perception</td>
<td>Localization</td>
</tr>
<tr>
<td>10</td>
<td>Localization</td>
<td>Localization</td>
</tr>
<tr>
<td>11</td>
<td>Localization</td>
<td>Trajectory planning</td>
</tr>
<tr>
<td>12</td>
<td>Localization; Trajectory planning and navigation</td>
<td>Trajectory planning</td>
</tr>
<tr>
<td>13</td>
<td>Trajectory planning and navigation</td>
<td>Obstacle avoidance</td>
</tr>
<tr>
<td>14</td>
<td>Trajectory planning and navigation</td>
<td>Integration</td>
</tr>
<tr>
<td>F.W.</td>
<td>Final Exam</td>
<td></td>
</tr>
</tbody>
</table>
STUDENT RESPONSIBILITY

It is expected that the student has read the assigned topics prior to class for the background necessary to properly participate in the discussions and think critically about the concepts addressed. As a general policy, for each hour the student is in class, the student should expect to spend at least two hours preparing outside of class. That is, since this course is for three credit hours, the student should expect to spend around six hours outside of class each week reading or solving problems.
REQUEST FOR ADDITION OF NEW COURSE

Department: Kinesiology

College: College of Human Sciences and Education

PROPOSED COURSE

Short Title: Autonomous Vehicles

Rubric & No.: KIN 4200

COURSE CREDIT

Graduate Credit: X YES  NO

Semester Hours of Credit: 3

(For combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of credit hours.

Credit will not be given for this course and: ENGR 4200

(Indicate rubrics and course numbers)

GRADING

Final Exam: X YES NO

Grading System: X Letter Grade  Pass/Fail

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

COURSE TYPE

(Indicate hours in the appropriate course type)

/ LEC/REC  / LEC/SEM  / LEC  / LAB  2/3  LEC/LAB  / SEM  / CLIN/PRACT  / RES/IND

Maximum enrollment per section: 20 (use integer, e.g. 25 not 20-30)

CATALOG TEXT

(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

KIN 4200 Autonomous Vehicles (3) See ENGR 4200.

BUDGET IMPACT

If this course is approved, will additional staff be needed? X YES NO

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

(If answer to either question above is "yes" attach explanation.)

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 curricula. 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 4-25-14

College Faculty Approval 5-15-14

Department Chair's Signature

College Dean's Signature

Graduate Dean's Signature (for 4000 level and above)

College Contact: Casey Bennett

College Contact E-mail: Cbenne5@lsu.edu
This course is being developed in support of the Robotics Engineering minor, and will expose students to one of the primary application areas for robots. The course is cross-listed as ENGR 4200 and KIN 4200 and does not duplicate other courses.
ENGR/KIN 4200 Autonomous Vehicles

CATALOG DESCRIPTION
ENGR 4200 Autonomous Vehicles (3) Prereq.: ENGR/KIN 3100 or equivalent; experience in MATLAB. 2 hrs. lecture; 3 hrs. lab. Vehicle kinematics, motion control, perception, localization, path planning, and navigation.

TEXT

PRE-REQUISITES BY TOPIC
Linear algebra, differential equations, and MATLAB.

COURSE OBJECTIVES
Students who complete this course will have learned: a) the different types of autonomous vehicles, b) the principles of kinematics, motion and trajectory planning, sensing, localization, and control of autonomous vehicles, and c) the different types of actuators and sensors employed by autonomous vehicles.

GRADING POLICY
Midterm exam 25%
Final exam 35%
Lab reports 30%
Homework 10%

Final grade: F < 60 ≤ D < 70 ≤ C < 80 ≤ B < 90 ≤ A.

TOPICS
1. Introduction
   - History of autonomous vehicles
   - Different types of autonomous vehicles
   - Mobile robot workspace
   - Cognitive architectures
   - Matrix algebra review
2. Vehicle Kinematics
   - Kinematic models and constraints
   - Position representation
   - Forward kinematics
   - Maneuverability
   - Motion control
3. Perception
   - Sensor classification
   - Evaluating sensor performance
   - Wheel/motor sensors and odometry
   - Representing uncertainty
   - Heading sensors
   - Gyrosopes
   - Accelerometers
   - Inertial measurement unit
   - Ground beacons
   - Laser range finders/LIDAR
   - Cameras
   - Computer vision
4. Localization
   - Belief representation
   - Map representation
   - Probability/statistics review
   - Probabilistic map-based localization
   - Kalman filter
   - Simultaneous localization and mapping

5. Path Planning and Navigation
   - Line following
   - Path planning
   - Obstacle avoidance
   - Navigation architectures

LAB ASSIGNMENTS
Lab experiments will be conducted in groups of two or three students, and will involve the use of a computer-controlled mobile robot and various sensors (LIDAR, Microsoft Kinect, and camera). The experiments will allow students to directly apply the concepts learned throughout the lectures to an autonomous ground vehicle. A written report will be submitted at the completion of each experiment by each group.

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Hardware/software introduction</td>
</tr>
<tr>
<td>2</td>
<td>Matrix algebra review; Kinematics</td>
<td>Hardware/software introduction</td>
</tr>
<tr>
<td>3</td>
<td>Vehicle Kinematics</td>
<td>Getting data from odometer and error correction</td>
</tr>
<tr>
<td>4</td>
<td>Vehicle Kinematics</td>
<td>Getting data from odometer and error correction</td>
</tr>
<tr>
<td>5</td>
<td>Vehicle Kinematics; Perception</td>
<td>Motor control</td>
</tr>
<tr>
<td>6</td>
<td>Perception</td>
<td>Implementing a rudimentary object tracker</td>
</tr>
<tr>
<td>7</td>
<td>Perception</td>
<td>Implementing a rudimentary object tracker</td>
</tr>
<tr>
<td>8</td>
<td>Midterm exam; Perception</td>
<td>Combining depth information with tracking</td>
</tr>
<tr>
<td>9</td>
<td>Perception</td>
<td>Localization</td>
</tr>
<tr>
<td>10</td>
<td>Localization</td>
<td>Localization</td>
</tr>
<tr>
<td>11</td>
<td>Localization</td>
<td>Trajectory planning</td>
</tr>
<tr>
<td>12</td>
<td>Localization; Trajectory planning and navigation</td>
<td>Trajectory planning</td>
</tr>
<tr>
<td>13</td>
<td>Trajectory planning and navigation</td>
<td>Obstacle avoidance</td>
</tr>
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STUDENT RESPONSIBILITY
It is expected that the student has read the assigned topics prior to class for the background necessary to properly participate in the discussions and think critically about the concepts addressed. As a general policy, for each hour the student is in class, the student should expect to spend at least two hours preparing outside of class. That is, since this course is for three credit hours, the student should expect to spend around six hours outside of class each week reading or solving problems.
**REQUEST FOR ADDITION OF NEW COURSE**

Department: Engineering  
College:  

**PROPOSED COURSE**

Short Title: **INDUSTRIAL ROBOTICS**  
Rubric & No: **ENGR 4100**  
Title: Industrial Robotics

**COURSE CREDIT**

Graduate Credit: X YES NO  
Semester Hours of Credit: 3  
(For combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.)

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of credit hours.

Credit will not be given for this course and: KIN 4100  
(Indicate rubrics and course numbers)

**GRADING**

Final Exam: X YES NO  
Grading System: x Letter Grade  
Pass/Fail

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

**COURSE TYPE**

(Indicate hours in the appropriate course type)

<table>
<thead>
<tr>
<th>LEC/REC</th>
<th>LEC/SEM</th>
<th>LEC</th>
<th>LAB</th>
<th>2/3</th>
<th>LEC/LAB</th>
<th>SEM</th>
<th>CLIN/PRACT</th>
<th>RES/IND</th>
</tr>
</thead>
</table>
| Max. enrollment per section: 20  
(use integer, e.g. 25 not 20-30)

**CATALOG TEXT**

(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

ENGR 4100 Industrial Robotics (3) Also offered as KIN 4100. Prereq.: ENGR/KIN 3100 or equivalent; ME 3133 or CE 2460 or equivalent; experience in MATLAB. 2 hrs. lecture; 3 hrs. lab. Robot manipulator kinematics; dynamics; trajectory planning; motion/force control; manipulator actuators and sensors.

**BUDGET IMPACT**

If this course is approved, will additional staff be needed? X YES NO  
Will additional space, equipment, special library materials or other major expense be involved? X YES NO  
(If answer to either question above is ‘yes’ attach explanation.)

Academic Affairs Approval:  

**ATTACHMENTS**

ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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: 2/12/14  
Department Chair’s Signature: 6/13/14  
Graduate Dean’s Signature (for 4000 level and above): 6/11/14  
College Contact: Warren Waggenspack  
College Contact E-mail: mewagg@lsu.edu  
College Faculty Approval: 4/8/14  
College Dean’s Signature: 6/11/14  
Chair, FS C&C Committee: 6/10/14  
Academic Affairs Approval: 6/12/14
Justification

This course is being developed in support of the Robotics Engineering minor, and will expose students to one of the primary application areas for robots, viz., industrial robots. The course is cross-listed as KIN410C and does not duplicate other courses.

The College of Engineering has committed to providing funds for initial equipment purchase (~$40k) and to starting a fund-raiser to help with subsequent purchases (~$35k). Lab space will also be made available by the College of Engineering.
ENGR 4100 Industrial Robotics

CATALOG DESCRIPTION
ENGR 4100 Industrial Robotics (3) Prereq.: ENGR/KIN 3100 or equivalent; ME 3133 or CE 2460 or equivalent; experience in MATLAB. 2 hrs. lecture; 3 hrs. lab. Robot manipulator kinematics, dynamics, trajectory planning, and motion/force control; manipulator actuators and sensors.

TEXT
Laboratory manual will be provided.

PRE-REQUISITES BY TOPIC
Linear algebra, differential equations, statics, dynamics, and MATLAB.

COURSE OBJECTIVES
Students who complete this course will have learned: a) the different types of industrial robot manipulators, b) the principles of kinematics, dynamics, trajectory planning, and control of industrial robots, and c) the different types of actuators and sensors employed by industrial robots.

GRADING POLICY
Midterm exam 25%
Final exam 35%
Lab reports 30%
Homework 10%

Final grade: F < 60 ≤ D < 70 ≤ C < 80 ≤ B < 90 ≤ A.

TOPICS
1. Introduction
   - Robot manipulator classification and terminology
   - Workspace
   - Industrial robot application examples
   - Matrix algebra review
2. Kinematics
   - Rigid body motions
   - Parameterizations of rotations
   - Homogenous transformations
   - Kinematic chains
   - Forward kinematics (Denavit-Hartenberg parameters)
   - Inverse kinematics
   - Velocity kinematics (Jacobian)
   - Manipulability
3. Dynamics
   - Kinetic and potential energy
- Euler-Lagrange formulation
- Properties of robot dynamic equations
- Newton-Euler formulation

4. Trajectory Planning
- Path versus trajectory
- Joint-space planning
- Task-space planning
- Multiple manipulator planning

5. Actuators and Sensors
- Transmissions
- Electric motors
- Power amplifiers
- Hydraulic and pneumatic actuators
- Position and velocity sensors
- Proximity sensors
- Force sensors
- Vision sensors and processing

6. Motion Control
- Independent joint control
- PID control
- Model-based control
- Task-space control

7. Force Control
- Natural and artificial constraints
- Stiffness control
- Impedance control
- Direct force control

LAB ASSIGNMENTS
Lab experiments will be conducted in groups of two or three students, and will involve the use of a computer-controlled robot arm. The experiments will allow students to directly apply the concepts learned throughout the lectures, including kinematics, dynamics, trajectory generation, and control, to an actual industrial-like robot. A written report will be submitted at the completion of each experiment by each group.

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
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<td>Matrix algebra review; Kinematics</td>
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<td>3</td>
<td>Kinematics</td>
<td>Forward kinematics</td>
</tr>
<tr>
<td>4</td>
<td>Kinematics</td>
<td>Inverse kinematics</td>
</tr>
<tr>
<td>5</td>
<td>Kinematics; Dynamics</td>
<td>Jacobian</td>
</tr>
<tr>
<td>6</td>
<td>Dynamics</td>
<td>Force rendering</td>
</tr>
<tr>
<td>7</td>
<td>Dynamics</td>
<td>Dynamics I</td>
</tr>
<tr>
<td>8</td>
<td><strong>Midterm exam</strong>: Trajectory Planning</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Trajectory Planning</td>
<td>Dynamics II</td>
</tr>
<tr>
<td></td>
<td>Actuators and Sensors</td>
<td>Trajectory planning in joint space</td>
</tr>
<tr>
<td>----</td>
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</tr>
<tr>
<td>10</td>
<td>Actuators and Sensors</td>
<td>Trajectory planning in task space</td>
</tr>
<tr>
<td>11</td>
<td>Motion Control</td>
<td>Setpoint control</td>
</tr>
<tr>
<td>12</td>
<td>Motion Control</td>
<td>Tracking control</td>
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<td>13</td>
<td>Force Control</td>
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<tr>
<td>F.W.</td>
<td>Final Exam</td>
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**STUDENT RESPONSIBILITY**

It is expected that the student has read the assigned topics prior to class for the background necessary to properly participate in the discussions and think critically about the concepts addressed. As a general policy, for each hour the student is in class, the student should expect to spend at least two hours preparing outside of class. That is, since this course is for three credit hours, the student should expect to spend around six hours outside of class each week reading or solving problems.
REQUEST FOR ADDITION OF NEW COURSE

PROPOSED COURSE
Rubric & No.: KIN 4100
Title: Industrial Robotics

COURSE CREDIT
Graduate Credit: X YES ___ NO
Semester Hours of Credit: 3
(Lecture Hrs. 2 Lab/Sem/Rec Hrs 1)

If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ___ credit hours.

Credit will not be given for this course and:

GRADING
Final Exam: X YES ___ NO
Grading System: X Letter Grade ___ Pass/Fail

CATALOG TEXT
(KIN 4100 Industrial Robotics (3) See ENGR 4100.

BUDGET IMPACT
If this course is approved, will additional staff be needed? YES X NO
Will additional space, equipment, special library materials or other major expense be involved? YES X NO

ATTACHMENTS
ATTACH THE FOLLOWING TO YOUR PROPOSAL.
JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 4-25-14
College Faculty Approval 5-15-14
Department Chair's Signature 6-11-14
Graduate Dean's Signature (for 4000 level and above) 6-11-14
College Contact: Casey Bennett
College Contact E-mail: Cbenne5@lsu.edu

Academic Affairs Approval 6-20-14
Chair, FS C&C Committee 6-18-14
Academic Affairs Approval 6-20-14
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost/Item</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Robotics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOEbot kit</td>
<td>$191</td>
<td>15</td>
<td>$2,865</td>
</tr>
<tr>
<td>Hexapod robot kit</td>
<td>$1,025</td>
<td>15</td>
<td>$15,375</td>
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<tr>
<td>Drone kit</td>
<td>$500</td>
<td>15</td>
<td>$7,500</td>
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<tr>
<td>Industrial Robotics</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Robot arm</td>
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<tr>
<td>Autonomous Vehicles</td>
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<tr>
<td>Kinetic sensor</td>
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<td>6</td>
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<tr>
<td>Camera</td>
<td>$2,000</td>
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<tr>
<td>LIDAR</td>
<td>$3,000</td>
<td>1</td>
<td>$3,000</td>
</tr>
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<td>iRobot Create</td>
<td>$220</td>
<td>6</td>
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<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td><strong>$75,380</strong></td>
</tr>
</tbody>
</table>
This course is being developed in support of the Robotics Engineering minor, and will expose students to one of the primary application areas for robots. The course is cross-listed as ENGR 4100 and KIN 4100 and does not duplicate other courses.
ENGR/KIN 4100 Industrial Robotics

CATALOG DESCRIPTION
ENGR 4100 Industrial Robotics (3) Prereq.: ENGR/KIN 3100 or equivalent; ME 3133 or CE 2460 or equivalent; experience in MATLAB. 2 hrs. lecture: 3 hrs. lab. Robot manipulator kinematics, dynamics, trajectory planning, and motion/force control; manipulator actuators and sensors.

TEXT

PRE-REQUISITES BY TOPIC
Linear algebra, differential equations, statics, dynamics, and MATLAB.

COURSE OBJECTIVES
Students who complete this course will have learned: a) the different types of industrial robot manipulators, b) the principles of kinematics, dynamics, trajectory planning, and control of industrial robots, and c) the different types of actuators and sensors employed by industrial robots.

GRADING POLICY
Midterm exam 25%
Final exam 35%
Lab reports 30%
Homework 10%

Final grade: F < 60 ≤ D < 70 ≤ C < 80 ≤ B < 90 ≤ A.

TOPICS
1. Introduction
   - Robot manipulator classification and terminology
   - Workspace
   - Industrial robot application examples
   - Matrix algebra review
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7. Force Control
   - Natural and artificial constraints
   - Stiffness control
   - Impedance control
   - Direct force control

LAB ASSIGNMENTS
Lab experiments will be conducted in groups of two or three students, and will involve the use of a computer-controlled robot arm. The experiments will allow students to directly apply the concepts learned throughout the lectures, including kinematics, dynamics, trajectory generation, and control, to an actual industrial-like robot. A written report will be submitted at the completion of each experiment by each group.

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STUDENT RESPONSIBILITY
It is expected that the student has read the assigned topics prior to class for the background necessary to properly participate in the discussions and think critically about the concepts addressed. As a general policy, for each hour the student is in class, the student should expect to spend at least two hours preparing outside of class. That is, since this course is for three credit hours, the student should expect to spend around six hours outside of class each week reading or solving problems.
**REQUEST FOR ADDITION OF NEW COURSE**

**Department:** Engineering  
**College:**  
**Date:** 03/19/14

**PROPOSED COURSE**  
**Short Title:** INTRODUCTION TO ROBOTICS  
**Rubric & No.:** ENGR 3100  
**Title:** Introduction to Robotics

**COURSE CREDIT**  
**Graduate Credit:** YES  
**Semester Hours of Credit:** 3  
If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ___ credit hours.

Credit will not be given for this course and: KIN 3100

**GRADING**  
**Final Exam:** YES  
**Grading System:** Letter Grade

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

**COURSE TYPE**  
**Maximum enrollment per section:** 30 (use integer, e.g. 25 not 20-30)

**CATALOG TEXT**  
(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

**ENGR 3100 Introduction to Robotics (3)** Also offered as KIN 3100. Prereq.: ME 2543 or IE 2060 or CSC 1253 or CSC 1350; MATH 2070 or 2085 or 2090. 2 hrs. lecture; 3 hrs. lab. Introduction to robotics and their applications. Sensors and DAQ; robotic actuators and mobility mechanisms; robot motion control; robot communications; behavioral control; navigation and mapping; robot coordination; human-robot interaction.

**BUDGET IMPACT**  
If this course is approved, will additional staff be needed? YES  
Will additional space, equipment, special library materials or other major expense be involved? YES

(If answer to either question above is "yes" attach explanation.)  
**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 curricula. 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:** 2/12/14  
**College Faculty Approval:** 4-8-14  
**College Dean's Approval:** 6-11-14  
**Chair, FS C&C Committee:** 6-18-14  
**Academic Affairs Approval:** (date)

**College Contact:** Warren Waggenspack  
**College Contact E-mail:** mewagg@lsu.edu
Justification

This course is being developed in support of the Robotics Engineering minor, and will be required for all students who declare the minor since it will provide an overview of the typical elements of a robotic system. The course is cross-listed as KIN 3100 and does not duplicate other courses.

The College of Engineering has committed to providing funds for initial equipment purchase (~$40k) and to starting a fund-raiser to help with subsequent purchases (~$35k). Lab space will also be made available by the College of Engineering.
ENGR 3100 Introduction to Robotics

CATALOG DESCRIPTION
ENGR 3100 Introduction to Robotics (3) Prereq.: ME 2543 or IE 2060 or CS 1253 or 1350; MATH 2070 or 2085 or 2090. 2 hrs. lecture; 3 hrs. lab. Introduction to Robotics and their applications. Sensors and DAQ; Robotic actuators and mobility mechanisms; Robot motion control; Robot communications; Behavioral control; Navigation & mapping; Robot coordination; Human-robot interaction.

TEXT

COURSE OBJECTIVES
Students completing this course should be able to:

• Demonstrate a working knowledge of robot controller programming
• Demonstrate effectively utilizing digital and analog I/O in robot programs
• Demonstrate controlling motion speed, direction, and positioning in robot programs
• Demonstrate using behavioral control in a robot program to solve goals
• Demonstrate using basic navigation and mapping in robot programs
• Demonstrate communicating between robots to coordinate actions
• Demonstrate an understanding of human-robot interaction principles

EVALUATION
Mid semester exam 25%
Final exam 35%
Semester project (team-based) 20%
Homework, quizzes, lab 20%
100%

GRADING 0 ≤ F < 60 ≤ D < 70 ≤ C < 80 ≤ B < 90 ≤ A ≤100.

SEMESTER PROJECT:
A semester term project is required and factors significantly into your grade. The project will involve design and implementation of a robot to accomplish some task(s). Teams will be composed of 3 to 4 people; all members must contribute equally to technical as well as written work. Team member journals, peer reviews, and individual interviews will be used to assess individual contribution to the team, and team members may receive different grades based on the outcome of this assessment. Peer reviews will also be used for presentations and the design report. Deliverables will include progress reports, a design report and presentation, and a final report and presentation (including demonstration). Requirements for each report / deliverable will be discussed in-class when they are assigned.

ASSIGNMENTS, QUIZZES, & IN-CLASS/LAB WORK
• All assignments must be turned in at the beginning of the class period in which they are due. Late homework & lab assignments will receive a penalty of 20 points (out of 100) for each day overdue, and will not be accepted after solutions are posted.
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- Quizzes or in-class/lab assignments may be given at any lecture or lab; no prior notice will be given.

### COURSE OUTLINE

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<th>LAB COVERAGE</th>
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<td>F.W.</td>
<td>FINAL EXAM</td>
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### STUDENT RESPONSIBILITY

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REQUEST FOR ADDITION OF NEW COURSE

Department: Kinesiology
Date: 04/22/14

College: College of Human Sciences and Education

PROPOSED COURSE
Rubric & No.: KIN 3100
Title: Introduction to Robotics

COURSE CREDIT
Graduate Credit: YES X NO
Semester Hours of Credit: 3
(For combination course types only: 2 Lecture Hrs. 1 Lab/Sem/Rec Hrs.
If course may be repeated for credit (i.e. special topics), course may be taken for a max. of ________ credit hours.
Credit will not be given for this course and: ENGR 3100
(Indicate rubrics and course numbers)

GRADING
Final Exam: X YES NO
Grading System: Letter Grade X Pass/Fail
(Attach justification if the proposed course will not hold a final exam during examination week.)

COURSE TYPE
(Indicate hours in the appropriate course type)

___ LEC/REC ___ LEC/SEM ___ LEC ___ LAB 2/3 ___ LEC/LAB ___ SEM ___ CLIN/PRACT ___ RES/IND

Maximum enrollment per section: 30
(Use integer, e.g. 25 not 20-30)

CATALOG TEXT
(Concise catalog statement exactly as you wish it to appear in the LSU General Catalog)

BUDGET IMPACT
If this course is approved, will additional staff be needed? YES X NO
Will additional space, equipment, special library materials or other major expense be involved? YES X NO
(If answer to either question above is "yes" attach explanation.)

ATTACHMENTS
ATTACH THE FOLLOWING TO YOUR PROPOSAL.

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curricula. 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 4-25-14 4-25-14
College Faculty Approval 5-15-14

Melinda Solomon
Department Chair's Signature

Jennifer Curry
College Dean's Signature

Chair, FS C&C Committee

Graduate Dean's Signature (for 4000 level and above)

Casey Bennett
College Contact:

(Casey Bennett)

College Contact E-mail: Cbenne5@lsu.edu

Academic Affairs Approval

(date)

(date)

(date)

(date)
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost/Item</th>
<th>Quantity</th>
<th>Total Cost</th>
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<td>Intro to Robotics</td>
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<tr>
<td>BOEbot kit</td>
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<td>$2,865</td>
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<td>Hexapod robot kit</td>
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<td>Drone kit</td>
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<td>Industrial Robotics</td>
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<tr>
<td>Autonomous Vehicles</td>
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<tr>
<td>Kinetic sensor</td>
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<tr>
<td>Camera</td>
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<td>LIDAR</td>
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<tr>
<td>iRobot Create</td>
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