PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(60000-60999 LEVEL)

DEPARTMENT: Engineering
EFFECTIVE SESSION: Fall 2014

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- 1. New course with supporting documents (complete proposal form)
- 2. Add existing course offered at another campus
- 3. Expiration of a course
- 4. Change in course number
- 5. Change in course title
- 6. Change in course credit/term
- 7. Change in course attributes
- 8. Change in Instructional hours
- 9. Change in course description
- 10. Change in course requisites
- 11. Change in semesters offered
- 12. Transfer from one department to another

PROPOSED: 

<table>
<thead>
<tr>
<th>Subject Abbreviation: CE</th>
<th>Course Number: 51800</th>
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<tbody>
<tr>
<td>Long Title: Bridge Design</td>
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<tr>
<td>Short Title: Bridge Design</td>
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EXISTING: 

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<tr>
<th>Subject Abbreviation:</th>
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TERMS OFFERED: Check All That Apply:
- Fall
- Spring
- Summer

CAMPUS(ES) INVOLVED:
- Calumet
- Cont Ed
- Ft. Wayne
- Indiana School
- Tech Statewide
- W. Lafayette

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range: Minimum Cr. Hrs. (Check One) To Maximum Cr. Hrs.
3. Equivalent Credit: Yes
4. Thesis Credit: Yes

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable Minimum Repeatable Credit: Maximum Repeatable Credit:
4. Credit by Examination
5. Fees: √ Cooperated Lab Rate Request
   Include comment to explain fee

SCHEDULE TYPE
- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- Pract/Observ

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
P: CE 47500 and CE 47800 or equivalent or permission from instructor. Graduate Standing or Senior in Engineering. This course introduces the fundamentals of steel bridge theory, analysis, and design, including single and continuous span bridge structures according to the AASHTO LRFD. Other topics covered in the course include connection design and modeling, failure analysis, deck design, and bearing design. Industry-accepted software is used for project work.

*COURSE LEARNING OUTCOMES

Calumet Department Head: Date
Fort Wayne Department Head: Date
Indiana Department Head: Date
North Central Department Head: Date
West Lafayette Department Head: Date
Graduate Area Committee Convener: Date
Calumet School Dean: Date
Fort Wayne School Dean: Date
Indiana School Dean: Date
North Central School Dean: Date
West Lafayette College/School Dean: Date
Graduate Dean: Date
Calumet Director of Graduate Studies: Date
Fort Wayne Director of Graduate Studies: Date
IUPUI Associate Dean for Graduate Education: Date
North Central Director of Graduate Studies: Date
Date Approved by Graduate Council: Date
Graduate Council Secretary: Date
West Lafayette Registrar: Date

OFFICE OF THE REGISTRAR
Supporting Document
to accompany the Registrar's FORM 40G when:

1. Requesting a New Graduate Course (Complete Section I)
or

2. Adding Distance as an Additional Schedule Type (Complete Section II)

To: Purdue University Graduate Council
From: Faculty Member: Mohammad Alhassan
Department: Engineering
Campus: Fort Wayne
Date: 24 November 2013
Subject: Supporting Document to the Registrar's Form 40G

Contact for information if questions arise:
Name: Mohammad Alhassan
Phone Number: 260-481-6389
E-mail: alhassan@engr.pfw.edu
Campus Address: ETC5, 321A
Course Subject Abbreviation and Number: CE.5xx00
Course Title: Bridge Design

SECTION I

A. Justification for the Course:

- Provide a complete and detailed explanation of the need for the course (e.g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing majors and/or concentrations, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.

The Department of Engineering has approved a new civil engineering concentration to its Master in Engineering Degree. This course will be used to provide to provide new knowledge in bridge analysis and Design.

- Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

The target audience are graduate and undergraduate senior students. It is anticipate to have more than five students at the beginning of the offering and steadily increase to have more that 10 students in the class. The course rigor will be at a level of graduate courses and include but limited to an independent project or research work submitted, presented, and defended by the end of the semester.
B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

Students who successfully complete this course will be able to:
1. Distinguish between the various types of bridges and their major components.
2. Understand the major requirements for bridge design and evaluation.
3. Calculate the self-weight of all the components of the bridge and calculate their resulting moments and shears in the bridge slab and girders.
4. Evaluate the live load effects on the various components of the bridge according to the AASHTO LRFD code.
5. Use the various load combinations to calculate the maximum internal forces in each member according to the dead and live loads.

- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)

The assessment of the courses will be based on:
1) Direct measures include homework, quizzes, exams, term paper/project.
2) Indirect measure include class participation and student survey at the end of semester to evaluate to what degree students believe they master the learning outcomes of the course.

- Grading criteria (select from drop down boxes); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

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<thead>
<tr>
<th>Criteria</th>
<th>Exams and Quizzes</th>
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<th>Homework</th>
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- Identify the method(s) of instruction (select from drop down box) and describe how the methods promote the likely success of the desired student learning outcomes.

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<th>Method of Instruction</th>
<th>Lecture</th>
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<th>Method of Instruction</th>
<th>Presentation</th>
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<th>Lecture</th>
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C. Prerequisite(s):

- List prerequisite courses by subject abbreviation, number, and title.

CE 478 Concrete Design & CE 475 Steel Design or equivalent.

- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

Graduate standing or senior in engineering.

D. Course Instructor(s):

- Provide the name, rank, and department/program affiliation of the instructor(s).

Dr. Mohammad Alhassan, Associate Professor of Civil Engineering, Civil Engineering program

- Is the instructor currently a member of the Graduate Faculty?  ☒ Yes — No

(If the answer is no, indicate when it is expected that a request will be submitted.)
E. Course Outline:

- Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

1. Bridge Types
2. Requirements for Bridge Design and Evaluation
3. Loads, Load Effects, and Load Combinations
4. Superstructure Design
5. Bearing Design
6. Substructure Design
7. Highway Bridge Evaluation

F. Reading List (including course text):

- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.

Text Book:

References
3. Bridge Design Manual, Precast/Prestressed Concrete Institute (PCI)

G. Library Resources

- Describe the library resources that are currently available or the resources needed to support this proposed course.

1) Access to several research databases including ERIC and Academic Search Premier (EBSCO).
2) Bridge design & engineering, Journal/Periodical.
4) Chavel, Brandon W., Framework for improving resilience of bridge design.
6) Culmo, Michael P. Accelerated bridge construction experience in design, fabrication and erection of prefabricated bridge elements and systems : final manual, 2011.

H. Example of a Course Syllabus (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs. See Appendix K.)


(Revised and Approved by the Graduate Council 2/13)
SECTION II

New graduate degree program policies and guidelines, approved by the Indiana Commission for Higher Education on August 10, 2012, require additional documentation regarding modes of delivery. Please complete Section II when adding an additional mode of delivery to an existing graduate course.

A. Justification for New Proposed Mode of Delivery (Complete)

B. Learning Outcomes and Method of Evaluation or Assessment:
(Complete if different from approved mode of delivery)

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)
• Grading criteria (select from drop down boxes); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

Criteria

Criteria

Criteria

• Identify the method(s) of instruction (select from drop down box) and describe how the methods promote the likely success of the desired student learning outcomes.

Method of Instruction

Method of Instruction

Method of Instruction

Method of Instruction

Method of Instruction

Method of Instruction

Method of Instruction

Method of Instruction

C. Prerequisite(s):
(Complete if different from approved mode of delivery)

• List prerequisite courses by subject abbreviation, number, and title.

D. Course Instructor(s):

• Provide the name, rank, and department/program affiliation of the instructor(s).

• Is the instructor currently a member of the Graduate Faculty?  — Yes  — No
(If the answer is no, indicate when it is expected that a request will be submitted.)
E. Course Outline:
(Complete if different from approved mode of delivery)
- Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory of field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For specials topic courses, include a sample outline of a course that would be offered under the proposed course.

F. Reading List (including course text):
(Complete if different from approved mode of delivery)
- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.

- A secondary reading list or bibliography should include material students may use as background information.
G. Library Resources
(Complete if different from approved mode of delivery)

- Describe the library resources that are currently available or the resources needed to support this proposed course.
1. Instructor Information

Name and Title: Mohammad Alhassan, Associate Professor of Civil Engineering.
Office: ET 327A
Office Hours: TBD
Contacts: Phone: (260) 481-6389.
E-mail: alhassan@engr.ipfw.edu

2. Course Information

Course title and number: CE 5xx00 "Bridge Design"
Number of credit hours: 3
Course description: This course introduces the fundamentals of steel bridge theory, analysis, and design, including single and continuous span bridge structures according to the AASHTO LRFD. Other topics covered in the course include connection design and construction, fatigue analysis, deck design and bearing design. Industry-appropriate software is used for project work.
Course prerequisites: CE 47800 Concrete Design and CE 47500 Steel Design or equivalent or permission from instructor.
Description of students for whom the course was designed: Graduate or Senior Engineering students.
References:
3. Bridge Design Manual, Precast/Prestressed Concrete Institute (PCI)

Course Outline
1. Bridge Types
2. Requirements for Bridge Design and Evaluation
3. Loads, Load Effects, and Load Combinations
4. Superstructure Design
5. Bearing Design
6. Substructure Design
7. Highway Bridge Evaluation
3. Goals and Course Outcomes

1. Course Goals:
   To introduce the students to and prepare them to design new bridges and evaluate existing bridges according to the latest AASHTO design Code.

2. Course Outcome:
   Upon successful completion of the course, students should be able to:
   1. Distinguish between the various types of bridges and their major components.
   2. Understand the major requirements for bridge design and evaluation.
   3. Calculate the self-weight of all the components of the bridge and calculate their resulting moments and shears in the bridge slab and girders.
   4. Evaluate the live loads effects on the various components of the bridge according to the AASHTO LRFD code.
   5. Use the various load combinations to calculate the maximum internal forces in each member according to the dead and live loads.
   6. Design the bridge deck concrete slab.
   7. Design the bridge girders; prestressed concrete girders or steel stringers.
   8. Basic knowledge of bearing design and substructure design
   9. Evaluate the condition of highway bridges through inspection.
   10. Apply relevant AASHTO LRFD Code provisions to ensure safety and serviceability of structural elements of the bridge.
   11. Utilize advanced computer software packages (SAP2000) for the analysis and design of steel structures.
   12. Learn about signature bridges and contemporary issues in bridge design

4. Course Policies

Quizzes
   Pop Quizzes will be given to help you follow consistently with the course materials. There will be no make-up quizzes. In each lecture; each student is expected to know the basic information about the lecture’s topic and the previous lecture.

Homework
   You are expected to work the assigned homework problems individually, although you are encouraged to discuss the problems with me or the students. Homework is due at the beginning of class on the date specified (usually one week from the assigned date). Late homework will not be accepted for credit, except as approved by the instructor.

SAP2000/ETABS
   Learning the basic principles of SAP2000/ETABS will be very beneficial in your future career. There will be basic structural systems to be modeled and analyzed using the SAP2000/ETABS.

Exams & Grades
   - Midterm Exam .................................................. 25%
   - Quizzes & Homework...................................... 25%
   - SAP2000 Project.......................................... 20%
   - Final Exam .................................................. 30%
Policies

- I expect that you will receive any emails I send to your IPFW email account. Check this account daily or forward the messages to another account you do check daily.

- As a courtesy to the instructor and other students, do not be late for class and turn off your cell phone.

- You are expected to attend all classes. If you miss a class for any reason you are responsible for determining what material was covered, what assignments were made, and what announcements were made. You may be dropped from the course or have your grade penalized for lateness or absence exceeding 3 hours of class time without acceptable reason such as illness or emergencies.

- No make-up exams or quizzes are allowed. However, documented special circumstances such as illness or emergencies will be considered. Please notify me by email or by phone as early as possible.

- Use 8½ x 11 paper size for the homework. Provide a cover page on your homework and show your name, course and assignment number. Staple all pages together. Final answers shall be clearly identified by an arrow-head, circle, underline, etc. If the numerical answer has units, such as feet, pounds, etc., show these units. Points may be lost for unspecified units and for units specified wrong.

- As engineering students, you are expected to give attention to the presentation of your work so that it will be neat and concise and adequately demonstrate your knowledge of the subject. Sloppy or carelessly presented work may be penalized by the loss of grade points or may be returned to you to be done over again.

- Do not give 8 and 10 place readouts. Do not make unnecessary subtotal computations. Round off final answer to 3 significant figures.

- When data used in homework or tests is obtained from reference material, show the reference page number in parentheses beside the data.

- Instructor reserves the right to raise the resultant grade when, in his opinion it is proper to do so. Factors being considered will be attendance, lateness, class participation, and attentiveness.

- Many students have found an advantage in studying together in small groups. In this way, the resources of each student are used to benefit all members of the group. Each individual student is expected to actually do his own work, using his preference as a format and detail.

- Students with a disability should contact the SSD office at Walb 113 (481-6657) or visit the SSD website at www.ipfw.edu/ssd for a description of services available.

- Students are expected to above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the
possibility of failure in the course. Scholastic dishonesty included but not limited to
submission for credit of any work or materials that are attributable in whole or in part to another person. For more information about academic honesty rules and regulations, you may visit IPFW regulations at:
http://www.ipfw.edu/academics/regulations/honesty.shtml

<table>
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<tr>
<th>Important Dates</th>
<th>August 29</th>
<th>Last day for full refund</th>
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<tbody>
<tr>
<td></td>
<td>Pass/Not Pass and Audit-to-Credit Deadline</td>
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<tr>
<td>September 1</td>
<td>Labor Day Holiday</td>
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<td>October 6</td>
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<td>October 20</td>
<td>Midterm Exam</td>
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<tr>
<td>October 13-14</td>
<td>Fall Recess</td>
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<td>November 26-28</td>
<td>Thanksgiving Recess</td>
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<tr>
<td>Week of December 8</td>
<td>Project due, presentations</td>
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<tr>
<td>December 15-22</td>
<td>Last Week of Classes and Final Exam</td>
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“In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. You should receive an e-mail with the details, an updated printed calendar in the class, and information will be posted on Blackboard.”