PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

DEPARTMENT: Engineering

EFFECTIVE SESSION: Fall 2010

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/type
☐ 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:

Subject Abbreviation: ECE
Course Number: 60800
Long Title: Computational Models And Methods
Short Title: Computational Models & Methods

EXISTING:

Subject Abbreviation
Course Number
Long Title
Short Title

TERMS OFFERED:

Check all that apply:
☐ Summer
☒ Fall
☒ Spring

CAMPUS(ES) INVOLVED:

☒ Calumet
☐ Cont Ed
☐ N. Central
☐ Tech Statewide
☐ Ft. Wayne
☐ W. Lafayette
☐ Indianapolis

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

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:
   Minimum Cr. Hrs. (Check One) To
   (Check One) Maximum Cr. Hrs.
3. Equivalent Credit: Yes ☐ No ☒
☐ 4. Thesis Credit: Yes ☐ No ☒

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only
☐ 2. Satisfactory/Unsatisfactory Only
☐ 3. Repeatable
☐ 4. Credit by Examination
☐ 5. Special Fees
☐ 6. Registration Approval Type
   ☐ Department
   ☐ Instructor
☐ 7. Variable Title
☐ 8. Honors
☐ 9. Full Time Privilege
☐ 10. Off Campus Experience

Schedule Type

Lecture ☐ Recitation ☐ Presentation ☐ Laboratory ☐
Lab Prep ☐ Studio ☐ Distance ☐ Clinic ☐
Experiential ☐ Research ☐ Ind. Study ☐ Pract/Observe ☐

Minutes Per Min 75 1 2 3 4
Meeting Per Week 2 3 4 5 6
Weeks Offered 15 15 15 15 15
% of Credit Allocated 100 100 100 100 100

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Computation models and techniques for the analysis of algorithm complexity. The design and complexity analysis of recursive and nonrecursive algorithms for searching, sorting, set operations, graph algorithms, matrix multiplication, polynomial evaluation and FFT calculations. NP-complete problems. Prerequisites: Graduate standing.

Calumet Department Head

Calumet School Dean

Calumet Undergrad Curriculum Committee

Fort Wayne Department Head

Fort Wayne School Dean

Fort Wayne Chancellor

Indianapolis Department Head

Indianapolis School Dean

Undergrad Curriculum Committee

North Central Faculty Senate Chair

Vice Chancellor for Academic Affairs

Date Approved by Graduate Council

West Lafayette Department Head

West Lafayette College/School Dean

Graduate Council Secretary

West Lafayette Registrar

OFFICE OF THE REGISTRAR
Supporting Document for a New Graduate Course

To: Purdue University Graduate Council
From: Faculty Member: Carlos Pomalaza-Raez
Department: Engineering
Campus: Fort Wayne
Date: 6/30/2010
Subject: Proposal for New Graduate Course-Documentation Required by the Graduate Council to Accompany Registrar's Form 40G

Contact for information if questions arise:

<table>
<thead>
<tr>
<th>Name</th>
<th>Don Mueller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone Number:</td>
<td>260-481-5707</td>
</tr>
<tr>
<td>E-mail:</td>
<td><a href="mailto:muellerd@ipfw.edu">muellerd@ipfw.edu</a></td>
</tr>
<tr>
<td>Campus Address:</td>
<td>ET 321 (Fort Wayne Campus)</td>
</tr>
</tbody>
</table>

Course Subject Abbreviation and Number: BCE 60800
Course Title: Computational Models And Methods
Supporting Document for a New Graduate Course

To: Purdue University Graduate Council
Reviewer:
From: Faculty Member: Dr. Carlos Pomalaza-Ráez
        Department: Engineering
        Campus: Fort Wayne
Date: June 30, 2010
Subject: Proposal for New Graduate Course-Documentation Required by the Graduate Council to Accompany Registrar’s Form 40G

Contact for information if questions arise: Name: Dr. Don Mueller
Phone Number: (260) 481-5707
E-mail: mullerd@ipfw.edu
Campus Address: ET 321 (Fort Wayne)

Proposed Course Number: ECE 608
Proposed Course Title: Computational Models and Methods
Credits: 3

A. Justification for the Course:

• Need for the course

This course material is critical to graduate students in Electrical Engineering and Computer Engineering areas.

• Level of the course:

Anticipated enrollments of undergraduate and graduate students.
  - Anticipated Percentage of Graduate Student Enrollment: 100%
  - Anticipated Percentage of Undergraduate Student Enrollment: 0%

B. Learning Outcomes and Method of Evaluation or Assessment

• Learning outcomes:

After taking the course, students are expected to be familiar with the following: Computation models and techniques for the analysis of algorithm complexity. The design and complexity analysis of recursive and non-recursive algorithms for searching, sorting, set operations, graph algorithms, matrix multiplication, polynomial evaluation and FFT calculations. NP-complete problems.
• Method of evaluation or assessment

  20% Midterm Exam 1  
  20% Midterm Exam 2  
  20% Midterm Exam 3  
  10% Homework  
  30% Final exam

C. Prerequisite(s):

Graduate Standing

D. Course Instructor(s):

Dr. Chao Chen, Dr. Carlos Pomalaza-Ráez.  
Members of the Gradate Faculty. CVs attached.

E. Course Outline:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Time and space complexity; analysis methods</td>
</tr>
<tr>
<td>2.5</td>
<td>Models of computation Turing mach</td>
</tr>
<tr>
<td>2.5</td>
<td>Recurrence formulas, discrete mathematics</td>
</tr>
<tr>
<td>1.5</td>
<td>Sorting</td>
</tr>
<tr>
<td>1.5</td>
<td>Search; Set Operations</td>
</tr>
<tr>
<td>2</td>
<td>Graph Algorithms</td>
</tr>
<tr>
<td>1</td>
<td>Polynomial, matrix and FFT algorithms</td>
</tr>
<tr>
<td>2</td>
<td>NP-complete problems</td>
</tr>
</tbody>
</table>

F. Reading List:

• Text:


G. Library Resources:

The IPFW Walter E. Helmke Library currently has reference books available for students to borrow in the subject area.
Name: Chao Chen, Ph.D.

Degrees: B.S. in Electronic Engineering, Shanghai Jiao Tong University, China, 1998  
M.S. in Electronic Engineering, Shanghai Jiao Tong University, China, 2001  
M.S. in Electrical and Computer Engineering, Georgia Institute of Technology  
Ph.D. in Electrical and Computer Engineering, Georgia Institute of Technology, 2005  

Appointments:  
2005-present Assistant Professor, Indiana University – Purdue University Fort Wayne  

Selected recent publications related to the proposed courses to be taught (ECE 600 & ECE 608) 


Synergistic Activities

Technical Activities:

- Technical Program Committee (TPC) member for:
  - IEEE International Conference on High Performance Computing and Communications (HPCC 2009 and 2010)
  - International Conference on Network and System Security (NSS 2009 and 2010)
  - International conference on Future Information Technology (FutureTech 2010)
  - International Workshop on Management of Emerging Networks and Services (MENS 2009 and 2010)
  - 2009 World Congress on Computer Science and Information Engineering (CSIE 2009)
  - IASTED International Symposium on Distributed Sensor Networks (DSN 2008)
  - International Conference on Computer Communications and Networks (ICCCN 2008)
  - IEEE Vehicular Technology Conference (VTC 2008 Spring)
  - IASTED International Conference on Sensor Networks (SN 2008)

- Technical Referee for:
  - Conferences: MASS, Mobihoc, Networking, ICC, WCNC, VTC, NSS, ACC, ITRE, QoIS, BroadWISE, CSIE, HPCC, DSN, SN, EUSIPCO, etc.

Member:

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Communications Society
- American Society for Engineering Education (ASEE)

Faculty Advisor:

- IEEE Student Chapter at Indiana University - Purdue University Fort Wayne