**Department:** Electrical and Computer Engineering  
**Effective Session:** Fall 2004

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

1. New course with supporting documents  
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

**Proposed:**

- **Subject Abbreviation:** ECE  
- **Course Number:** 517  
- **Long Title:** Visualization Techniques  
- **Short Title:** Visualization Techniques  

**Existing:**

- **Subject Abbreviation:**  
- **Course Number:**  

**Terms Offered:**

- Summer  
- Fall  
- Spring  

**Campus(ES) Involved:**

- Calumet  
- Indianapolis  
- W. Lafayette  
- Tech Statewide  

**Credit Type:**

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

**Course Attributes:**

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

**Course Description (Include Requisites):**

Prerequisites: ECE 368 and ECE 369.

Topics in and algorithms for visualization: scientific visualization, medical visualization, information visualization, and volume rendering techniques. Fundamental algorithms, advanced techniques, design criteria, and application specific issues will be explored.

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**Calumet Undergrad Curriculum Committee:**
- **Date:**  
- **Calumet Department Head:**
- **Date:**  
- **Calumet School Dean:**
- **Date:**  

**Fort Wayne Department Head:**
- **Date:**  
- **Fort Wayne School Dean:**
- **Date:**  

**Indianapolis Department Head:**
- **Date:**  
- **Indianapolis School Dean:**
- **Date:**  

**North Central Department Head:**
- **Date:**  
- **North Central Chancellor:**
- **Date:**  

**West Lafayette Department Head:**
- **Date:**  
- **West Lafayette School Dean:**
- **Date:**  

**Graduate Area Committee Convener:**
- **Date:**  
- **Graduate Dean:**
- **Date:**  

**Undergrad Curriculum Committee:**
- **Date:**  
- **Graduate Council:**
- **Date:**  

**Office of the Registrar**
TO: The Engineering Faculty
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: New Dual-Level Course

The faculty of the School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ECE 517 Visualization Techniques
Sem. I. Class 3, cr. 3. (Offered in alternate years.)
Prerequisites: ECE 368 and ECE 369.

Topics in and algorithms for visualization: scientific visualization, medical visualization, information visualization, and volume rendering techniques. Fundamental algorithms, advanced techniques, design criteria, and application specific issues will be explored.

Reason:
Visualization has become a fundamental tool for engineering and science. This course will prepare computer engineering students, as well as engineering and science students to effectively use, evaluate, design, and develop visualizations and visualization software. Computer graphics and visualization are important, fundamental components of modern computer engineering. Therefore, we need this course to educate our students on the basic algorithms, techniques, and tools of this field. This course was offered in Fall 2001 and Fall 2002 with 13 and 18 students, respectively.

Mark J. T. Smith
Professor and Head

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE COMMITTEE ON
FACULTY RELATIONS

CFR Minutes 991
Date 5-7-04
Chairman CFR
Supporting Documentation:

1. Level: Dual Level

2. Course Instructor: David S. Ebert

3. Course Outline:

<table>
<thead>
<tr>
<th>Topics</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to visualization and course material</td>
<td>1</td>
</tr>
<tr>
<td>2. Fundamental graphics techniques and capabilities</td>
<td>2</td>
</tr>
<tr>
<td>3. Data characteristics and scalar techniques</td>
<td>3</td>
</tr>
<tr>
<td>4. Volume visualization techniques</td>
<td>6</td>
</tr>
<tr>
<td>5. Fundamentals of perception</td>
<td>3</td>
</tr>
<tr>
<td>6. Visualization design principles</td>
<td>3</td>
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<tr>
<td>7. Flow visualization</td>
<td>6</td>
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<tr>
<td>8. Review of the latest visualization research</td>
<td>3</td>
</tr>
<tr>
<td>9. Medical visualization</td>
<td>6</td>
</tr>
<tr>
<td>10. Information visualization techniques and applications</td>
<td>6</td>
</tr>
<tr>
<td>11. Advanced display techniques and virtual reality</td>
<td>3</td>
</tr>
<tr>
<td>12. Future trends and project results</td>
<td>2</td>
</tr>
</tbody>
</table>

Total 44
