<table>
<thead>
<tr>
<th>Required Course:</th>
<th>ECE 51000 Introduction to Biometrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit and contact hours:</td>
<td>(3 cr.) Class 3</td>
</tr>
<tr>
<td>2008-10 IUPUI Campus Bulletin description:</td>
<td>N/A</td>
</tr>
<tr>
<td>Prerequisite or corequisite:</td>
<td>ECE 301 and ECE 302; or Graduate Standing</td>
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<tr>
<td>Prerequisites by topic:</td>
<td>Probability, random process, and signal processing</td>
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<tr>
<td>Coordinator:</td>
<td>Yingzi Du, Assistant Professor of Electrical and Computer Engineering</td>
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<tr>
<td>Goals:</td>
<td>To teach students the basic concepts of biometrics, biometrics systems, and fundamental theories in biometrics; help student learn how to design and develop a biometric system for multi-level security applications.</td>
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<td>Outcomes:</td>
<td>Upon successful completion of the course, students should be able to</td>
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<tr>
<td></td>
<td>1. Understand the scope and options for biometrics [a, c, g, k]</td>
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<tr>
<td></td>
<td>2. Familiar with various biometric technologies and systems [a,c]</td>
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<td></td>
<td>3. Select and preliminary design of a biometric system for positive human identification for specific application scenario. This biometric system can be unimodal or multimodal [a,b,c, e, g,k]</td>
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<td>4. Evaluate of various biometric systems[a,c,j,k]</td>
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<td>5. Have working knowledge of each of the biometric technologies covered in lectures [a,c,i,k]</td>
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<tr>
<td>Topics:</td>
<td>1. Introduction to Biometrics (1 class)</td>
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<td></td>
<td>2. Brief introduction of digital image processing and Matlab in biometric image/signal processing (3 classes)</td>
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<td></td>
<td>3. Face recognition algorithms and systems (5 classes)</td>
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<td></td>
<td>4. Fingerprint recognition algorithms and systems (3 classes)</td>
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<td>5. Iris recognition algorithms and systems (6 classes)</td>
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<td>6. Speech &amp; speaker recognition algorithms and systems (4 classes)</td>
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<td>7. Brief introduction of other biometrics (2 classes):</td>
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<tr>
<td></td>
<td>a. Vein recognition</td>
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<td></td>
<td>b. Hand Geometry</td>
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<td></td>
<td>c. Palm recognition</td>
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<td>d. Gait recognition</td>
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<td>e. Other biometrics</td>
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<td>8. Multimodal biometrics (2 classes)</td>
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<td>9. Privacy issues and other aspects of biometrics (1 class)</td>
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<td>10. Applications of biometrics &amp; future trends (1 class)</td>
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<td></td>
<td>11. Exams and quizzes (2 classes and Final exam period)</td>
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<td>Computer usage:</td>
<td>frequently</td>
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<td>Laboratory projects:</td>
<td>None.</td>
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<tr>
<td>Evaluation methods:</td>
<td>One midterm project and one final project, several homework assignments, and 2 quizzes.</td>
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<td>ABET category:</td>
<td>Engineering science 50%, engineering design 50%.</td>
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<tr>
<td>Prepared by:</td>
<td>Yingzi Du</td>
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<td>Date:</td>
<td>April 20, 2010</td>
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