New Course Request

School of Engineering and Technology

ECET

Course Number: 351

Course Title: Instrumentation Applications for Technology

Recommended Abbreviation: Inst. Apps for Tech.

First time this course is to be offered (Semester/Year): Fall, 2008

Credit Hours: Fixed at 4 or Variable from ____ to ____

Is this course to be graded S-F (only)? Yes No

Is variable title approval being requested? Yes No

Description (not to exceed 50 words) for Bulletin publication:

Prereq: Math 221 and ECET 116 or ECET 107 (4 cr.) Class 3, Lab 2. Introduction to the basic concepts and terminology of instruments. This course covers the procedures and techniques essential to measurement of physical quantities (such as pressure, flow, temperature, and level measurement) and analysis of that data. Students will use data acquisition systems and computer control software to complete laboratory exercises.

Lecture Contact Hours: Fixed at 3 or Variable from ____ to ____

Non-Lecture Contact Hours: Fixed at 2 or Variable from ____ to ____

Estimated enrollment: 20 of which 0 percent are expected to be graduate students.

Frequency of scheduling: Once/year

Will this course be required for majors? No

Justification for new course: will serve needs of multiple programs within department (rather than separate courses)

Are the necessary reading materials currently available in the appropriate library? Yes

Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by: Richard E. Coll

Date 12/1/07

Dean

Date 12/1/07

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
ECET 351 – Instrumentation Applications for Technology

Catalog Description: (4 cr.) Class 3, Lab 2. Introduction to the basic concepts and terminology of instruments. This course covers the procedures and techniques essential to measurement of physical quantities (such as pressure, flow, temperature, and level measurements) and analysis of that data. Students will use data acquisition systems and computer control software to complete laboratory exercises.

Prerequisite: Math 221 and ECET 116 or ECET 107

Co-requisite: None


Coordinator: Elaine Cooney, Professor of ECET

Goals: Students will interface a variety of physical systems to computers for measurement and control.

Prerequisites by topic:
1. Prototype circuits with at least 10 components given a schematic.
2. Use of the following laboratory equipment:
   a. Current meter
   b. Volt meter
   c. Power Supply
   d. Function Generator
   e. Solderless Proto-board
3. Differentiate and integrate linear expressions

Course Outcomes: Upon completing this course, students should be able to:
1. Select and implement appropriate sensors to measure the following [3]:
   a. temperature
   b. pressure
   c. flow
   d. level measurements
   e. displacement
2. Write computer programs, using graphical program language, to collect, analyze and display sensor data using data acquisition hardware. [5]
3. Use PID control algorithms to control a physical plant. [2]
4. Use project management skills to complete a project in a timely manner. [11]
5. Function as a member of a team to complete a task. [6]

Topics:
1. Introduction (2 lectures)
2. Signal conditioning (4 lectures)
3. LabVIEW for Data Acquisition (4 lectures)
4. Thermal Sensors (3 lectures)
5. Mechanical sensors (6 lectures)
6. Mechanical actuators (4 lectures)
7. Control Principles (2 lectures)
8. PID Control (2 lectures)
Laboratory Experiments (some assignments are multi-period):

1. Amplifiers and filters
2. LabVIEW programming
3. Thermal sensors
4. Position sensors
5. Position control
6. Pressure sensors
7. Flow sensors
8. Fluid Process control
9. Thermal process control

Computer Usage:
1. LabVIEW programming language will be used to control data acquisition hardware and provide process control environment
2. Excel and Word will be used to present laboratory results and analysis

Evaluation Methods: Tests and quizzes, Laboratory assignments, homework, team projects

Prepared by: Elaine M. Cooney

Revised: November 27, 2007
**PURDUE UNIVERSITY**

**REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE (100-400 LEVEL)**

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>EFFECTIVE SESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Technology</td>
<td>Fall 2006</td>
</tr>
</tbody>
</table>

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

- [ ] New course with supporting documents
- [ ] Add existing course offered at another campus
- [ ] Expiration of a course
- [ ] Change in course number
- [ ] Change in course title
- [ ] Change in course credit type

**PROPOSED:**
- **Subject Abbr.** MGT
- **Course Number** 204
- **Course Title** Product Design and Specifications
- **Existing**
- **Subject Abbr.**
- **Course Number**
- **Course Title**

**CAMPUS(ES) INVOLVED:**

- [ ] N. Central
- [ ] Tech - Southeast
- [ ] W. Lafayette
- [ ] Indianapolis

**TERMS OFFERED:**

- [ ] Summer
- [ ] Fall
- [ ] Spring

**COURSE ATTRIBUTES:** Check All That Apply

- [ ] Pass/Fail, Pass Only
- [ ] Satisfactory/Unsatisfactory Only
- [ ] Resubstitution
- [ ] Remedial
- [ ] Honors
- [ ] Full Time Privilege
- [ ] Off Campus Experience

**CROSS-LISTED COURSES**

**COURSE DESCRIPTION:**

- **Lecture**
- **Recitation**
- **Presentation**
- **Laboratory**
- **Lab Prep**
- **Studio**
- **Distance**
- **Clinic**
- **Experiential**
- **Ind Study**
- **Prac/Observ**

**SIGNATURES:**

- [Signature] Column: Date
- [Signature] Fort Wayne: Date
- [Signature] Indianapolis: Date
- [Signature] North Central: Date
- [Signature] West Lafayette: Date

**OFFICE OF THE REGISTRAR**
# New Course Request

**Indiana University**

**IUPUI Campus**

Check Appropriate Boxes:  
- Undergraduate credit  
- Graduate credit  
- Professional credit

<table>
<thead>
<tr>
<th>1. School/Division</th>
<th>Engineering and Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Academic Subject Code</td>
<td></td>
</tr>
<tr>
<td>3. Course Number</td>
<td>MET204 (must be cleared with University Enrollment Services)</td>
</tr>
<tr>
<td>4. Instructor</td>
<td>D. Acheson</td>
</tr>
<tr>
<td>5. Course Title</td>
<td>Product Design and Specifications</td>
</tr>
<tr>
<td>Recommended Abbreviation (Optional)</td>
<td>Product Design Spcs</td>
</tr>
<tr>
<td>(Limited to 92 Characters including spaces)</td>
<td></td>
</tr>
<tr>
<td>6. First time this course is to be offered (Semester/Year):</td>
<td>Fall 2008</td>
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<tr>
<td>7. Credit Hours: Fixed at</td>
<td>3</td>
</tr>
<tr>
<td>or Variable from</td>
<td>to</td>
</tr>
</tbody>
</table>
| 8. Is this course to be graded S-F (only)? | Yes [ ] No [ ]
| 9. Is variable title approval being requested? | Yes [ ] No [ ] |
| 10. Course description (not to exceed 50 words for Bulletin publication): | P: TECH104 or CGT110, TECH105 or MET105 (Or Instructors Consent) - The Design, evaluation and documentation of engineering specifications required of manufacturability and assembly are introduced. Emphasis on CAD-based details, assemblies, design layouts, equipment installations and related industrial practices. |
| 11. Lecture Contact Hours: Fixed at | 2 |
| or Variable from | to |
| 12. Non-Lecture Contact Hours: Fixed at | 2 |
| or Variable from | to |
| 13. Estimated enrollment: | 30 |
| of which | 0 percent are expected to be graduate students. |
| 14. Frequency of scheduling: | Summer/Fall Spring |
| Will this course be required for majors? | Yes |
| 15. Justification for new course: | To serve the MET program requirements within the newly-formed Engineering Technology Department. |
| 16. Are the necessary reading materials currently available in the appropriate library? | Yes |
| 17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials. |
| 18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant. |
| 19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted. |

Submitted by:  
Michael E. Ofl  
Department Chairman/Division Director  
Date 11/5/97  
Dean of Graduate School (when required)

Approved by:  
Willard J.  
Dean  
Date 12/4/97  
Chancellor/Vice-President  
Date  
University Enrollment Services  
Date

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724
University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
COURSE DESCRIPTION

Revised: 21 - November 2007

Course: MET 204 – Product Design and Specifications

Catalog Data:
2 Lecture Hours     2 Lab Hrs.     3 Credit Hours
Prerequisites: TECH104 or CGT110, TECH105 or MET105

The Design, evaluation and documentation of engineering specifications required of manufacturability and assembly are introduced. Emphasis on CAD-based details, assemblies, design layouts, equipment installations and related industrial practices.

Offerings: Fall / Spring / Summer


Other Required Material
Mechanical pencil: .5mm, H or HB lead w/ Eraser
(1) Flash Drive

Course Coordinator: Doug Acheson, Associate Professor of Mechanical Engineering Technology

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Learning Objectives

1. Apply ANSI drawing techniques unique to various specialty industrial manufacturing processes in the production and interpretation of engineering drawings.

2. Follow current ANSI practices in generating a complete assembly/detail dimensioned set of drawings, given design intent and a mechanical design.

3. Apply standard rules for numerical significance, maintenance of design intent and with awareness of cost/benefit concerns when performing hard and soft conversions for dimensional specifications to/from metric units.

4. Use default specifications, standards documents and/or handbook data to verify design intent by calculating and documenting, via standard practices, allowable limits for any dimension or feature on the drawing, given an engineering drawing with custom and standard parts.

5. Use default specifications, standards documents and/or handbook data to verify design intent by calculating and documenting via standard practices, allowable limits and multi-part fits between parts for any dimension or part on the assembly, given engineering drawings for an assembly with custom and standard parts.
6. Isolate, revise and document the changes to engineering drawings via standard practices, when given a drawing set and engineering change authorization.

7. Seek answers to questions on technical specifications, company procedures, products or services, etc., using handbooks, national/international engineering standards, the internet or other references, to formally report, critique and/or present answers.

8. Cooperate with all team members to complete the common goals of a team project.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Casting Drawings</td>
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<td>2</td>
<td>Casting Drawings (Continued)</td>
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<tr>
<td>3</td>
<td>Weldments</td>
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<td>4</td>
<td>Weldments (Continued)</td>
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<td>5</td>
<td>Industrial Sketching</td>
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<td>6</td>
<td>Pattern Development</td>
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<td>7</td>
<td>Midterm Review</td>
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<tr>
<td>8</td>
<td>Midterm Exam</td>
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<tr>
<td>9</td>
<td>Assembly/Detail Sets</td>
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<tr>
<td>10</td>
<td>Assembly/Detail Sets (Continued)</td>
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<td>11</td>
<td>Fits and Change Orders</td>
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<tr>
<td>12</td>
<td>Geometric Dimensioning and Tolerancing</td>
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<tr>
<td>13</td>
<td>Geometric Dimensioning and Tolerancing (Continued)</td>
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<td>14</td>
<td>Commercial Drawings</td>
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<td>15</td>
<td>Final Exam Review</td>
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<td>16</td>
<td>Final Exam</td>
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</table>

Prepared by: Douglas C. Acheson                                      Date: November 21, 2007
## Course Request Form

**PURDUE UNIVERSITY**

**REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE**

**100-400 LEVEL**

**DEPARTMENT** Engineering Technology, IUPUI

**EFFECTIVE SESSION** Fall, 2008

### 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. Expatriation of a course
- 4. Change in course number
- 5. Change in course title
- 6. Change in course credit type
- 7. Change in course attributes (department head signature only)
- 8. Change in instructional hours
- 9. Change in course description
- 10. Change in course requisites
- 11. Change in semesters offered (department head signature only)
- 12. Transfer from one department to another

### PROPOSED:

- Subject Abbreviation: ECET
- Course Number: 351
- Long Title: Instrumentation Applications for Technology
- Short Title: Inst. Apps for Tech.

### EXISTING:

- Subject Abbreviation:
- Course Number:
- Long Title:
- Short Title:

### TERMS OFFERED

- Summer
- Fall
- Spring

### CAMPUS(ES) INVOLVED

- Calumet
- Cont Ed
- Ft. Wayne
- Tech Statewide
- W. Lafayette
- Indianapolis

### CREDITS

<table>
<thead>
<tr>
<th>CREDIT TYPE</th>
<th>Minutes</th>
<th>Meetings Per Week</th>
<th>Weeks Offered</th>
<th>% of Credit Allocated</th>
<th>Delivery Method (Asym. Or Syn.)</th>
<th>Delivery Medium (Audio, Internet, Live, Text-Based, Video)</th>
<th>Cross-Listed Courses</th>
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</thead>
<tbody>
<tr>
<td>1. Fixed Credit Cr. Hrs.</td>
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<td>2. Variable Credit Range Minimum Cr. Hrs. (Check One) To Or</td>
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<td>3. Equivalent Credit Yes No</td>
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<td>4. Thesis Credit Yes No</td>
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### INSTRUCTIONAL TYPE

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<th>Ind. Study</th>
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### COURSE DESCRIPTION

(4 cr.) Class 3, Lab 2, Prerequisites: Math 221 and ECET 116 or ECET 107. Introduction to basic concepts and terminology of instruments. This course covers the procedures and techniques essential to measurement of physical quantities (such as pressure, flow, temperature, and level measurements) and analysis of data. Students will use data acquisition systems and computer control software to complete laboratory exercises.

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**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 College/School Dean Date West Lafayette Registrar Date

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**OFFICE OF THE REGISTRAR**