**New Course Request**

**Indiana University**

**Indianapolis Campus**

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<table>
<thead>
<tr>
<th>Check Appropriate Boxes:</th>
<th>Undergraduate credit [✓]</th>
<th>Graduate credit [ ]</th>
<th>Professional credit [ ]</th>
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</thead>
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1. **School/Division**: Informatics
2. **Academic Subject Code**: NEWM-N
3. **Course Number**: 421 (must be cleared with University Enrollment Services)
4. **Instructor**: Prof. Polly Baker
5. **Course Title**: Physical Object Interfaces
   
   **Recommended Abbreviation (Optional)**
   
   (Limited to 32 Characters including spaces)

6. **First time this course is to be offered (Semester/Year)**: Fall 2010
7. **Credit Hours**: Fixed at 3 or Variable from ___________ to ___________
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: N222. Exploration of the possibilities for interacting with computer applications through physical objects and other tangible media. Introduces the use of several sensor technologies to support interactivity, including cameras, proximity, contact, and RFID. Students design, build, and evaluate applications that address various scenarios.

11. **Lecture Contact Hours**: Fixed at 3 or Variable from ___________ to ___________
12. **Non-Lecture Contact Hours**: Fixed at 0 or Variable from ___________ to ___________
13. **Estimated enrollment**: 25 of which 0 percent are expected to be graduate students.
14. **Frequency of scheduling**: F/S
   
   **Will this course be required for majors?**

15. **Justification for new course**: Redesign of New Media Curriculum
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.**

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**Submitted by:**

**M. Pauline Baker**

Department Chairman/Division Director

**Date**: 6/30/2009

**Approved by:**

**Date**: 7/1/2009

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**Dean of Graduate School (when required)**

**Date**

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**Chancellor/Vice-President**

**Date**

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**University Enrollment Services**

**Date**

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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.

UPN 724

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
Course Outline

Course Number: N421

Course Title: Physical Object Interfaces

Credits: 3 hours

Instructor: Prof. Polly Baker
Office Address: IT 400
Office Phone: 278-8150
Office Hours: TBA
Email Address: baker@iupui.edu

Course Description: Exploration of the possibilities for interacting with computer applications through physical objects and other tangible media. Introduces the use of several sensor technologies to support interactivity, including cameras, proximity, contact, and RFID. Students design, build, and evaluate applications that address various scenarios.

Prerequisites: N222

Course Outcomes: After completing this course, you should be able to:
- Demonstrate a simple vision-based interface
- Design and implement a sensor-based interface
- Analyze and discuss issues related to physical object interfaces
- Evaluate prototype applications
- Discuss issues related to multi-participant interaction scenarios

IUPUI PULs: This course incorporates the IUPUI Principles of Undergraduate Learning, especially Critical Thinking. Building software tools involves analyzing requirements, evaluating alternative designs, and applying knowledge to create a good result, all elements of critical thinking. The course also involves Core Communication and Quantitative Skills, in that you will discuss your designs with other class participants.

Recommended Texts: There is no textbook for this course. We will read a number of papers describing current research in tangible media interfaces.

Software: This course uses Adobe FlashBuilder and Adobe ActionScript, available in the Lab. Adobe Flash is available to students at http://iware.iu.edu. Adobe makes FlashBuilder available to students at no cost. We will discuss how to acquire and install these packages on your laptop or home computer.
Topic, by Week (tentative schedule)

1. Objects in the Interface: Why and How?
2. Review of ActionScript
3. Surveying the State of the Art, case studies
4. Capturing a video stream
5. Identifying movement
6. Responding to movement
7. Multi-touch environments
8. Multi-touch applications
9. Evaluating applications
10. Understanding Physical Widgets
11. Using Physical Widgets
12. Phidget-based Applications
13. Introducing RFID
14. Building an RFID Application
15. Designing for multiple participants
16. Looking Ahead: What’s on the Horizon?

Equipment: You will need some form of portable storage, such as a USB thumb drive, for saving your work.

Communication: All class documents, including the syllabus and assignments, will be posted on OnCourse. Feel free to email me at any time with questions or concerns.

Class Format: Our time in the classroom will combine lecture, demonstration, discussion, and hands-on lab exercises.

Reading Assignments: Reading materials will be available on OnCourse.

Homework: All assignments will be discussed during class and posted on OnCourse. In some cases, we will use classroom time to get started on an assignment, but you will also need to work on your own outside of class time to complete some assignments.
**Workload:** Becoming proficient in anything requires an investment of time and effort. This class will include a number of homework assignments, designed to let you practice and experiment with the concepts we are learning. As you budget your time for the semester, you should anticipate spending several additional hours per week on this course.

**Due Dates:** Assignments are due at the beginning of class, unless specified otherwise. Late assignments will be accepted only in a 24-hour window past the assignment date, and only for half-credit. There are no exceptions.

**Grading:** Your performance in the course is measured by the points you accumulate on homework assignments, lab exercises and presentations, and quizzes, with weights as follows:

- Lab activities: 40%
- Homework assignments: 30%
- Quizzes: 30%

Grades are based on points according to the following:

90 to 100 → A, 80 to 89 → B, 70 to 79 → C, 60 to 69 → D, 0 to 59 → F

**Attendance:** Attendance in class has been shown to contribute to academic success. At IUPUI, attendance in class is mandatory.

**Class Courtesy:** Come to class on time and be prepared. Turn off your cell phone and other noisy devices. Don’t do homework, answer email, or engage in conversation during class. Listen to your classmates when they are asking questions or presenting their work. Do not bring children with you to class.

**Plagiarism:**
Plagiarism is the use of the work of others without properly crediting the actual source of the ideas, words, sentences, paragraphs, articles, music, or pictures. Using other students’ work (with or without their permission) is plagiarism if you don’t indicate who did the work. Plagiarism is cheating. It is a serious offense and will be punished.

**Liability:** Your student ID and password are **private**! Protect yourself! Never share or loan your ID or your password to anyone!

All students should read the IUPUI Code of Student Rights, Responsibilities, available at [http://www.iupui.edu/code](http://www.iupui.edu/code). This document describes your rights and responsibilities as an IUPUI student.