INFO I211
Information Infrastructure II
Department of Human-Centered Computing
Indiana University School of Informatics and Computing, Indianapolis

Instructor: Louie Zhu, Ph.D.

Course Description
The systems architecture of distributed applications. Advanced programming, including an introduction to the programming of graphical systems

Extended Course Description
This course continues the exploration of topics in systems architecture of Web-based applications in greater depth, with emphasis on practices of developing well-designed, reusable software components. Basic and advanced object-oriented programming (OOP) knowledge and practices are covered. The well-known software architectural pattern Model/View/Controller (MVC) is used. Application development with Rapid Application Development (RAD) method is also briefly introduced.

Learning Outcomes
Upon successful completion of this course, students will be able to:

1. Explain basic concepts of object-oriented programming.
2. Construct and use OOP classes.
3. Implement reusable software components with advanced OOP features including object encapsulation, inheritance, and polymorphism.
4. Design classes with interfaces and abstract classes.
5. Create asynchronous Web applications with AJAX and XML.
6. Handle errors and exceptions in PHP.
7. Design complex software with MVC design pattern.
8. Rapidly develop information systems with CodeIgniter framework.

Prerequisites
Be familiar with PHP syntax; knowledge of procedural programming; and experience with developing dynamic web applications with server-side technology. Prior to taking this course, students should have successfully completed I210 with a C or better grade, Information Infrastructure I, or have acquired equivalent experiences.
Recommended Textbook


Video Courses from Lynda.com

Please search for these titles in Lynda.com.

- PHP with MySQL beyond the Basics with Kevin Skoglund
- Object-oriented Programming with PHP with Jon Peck
- MVC Framework for Building PHP Application with Drew Falkman
- JavaScript and AJAX with Ray Villalobos

Equipment Needed

- A reliable laptop computer running Windows, Mac OS, or Linux operating system. Please visit http://informatics.iupui.edu/technology/laptop for information on the Laptop Initiative for Informatics majors.

Software Needed


Principles of Undergraduate Learning

Learning outcomes are assessed in the following areas:

1A. Core communication: written, oral and visual skills  
1B. Core communication: quantitative skills  
1C. Core communication: information resources skills  
2. Critical thinking  
3. Integration and application of knowledge  
4. Intellectual depth, breadth, and adaptiveness  
5. Understanding society and culture  
6. Values and ethics

This course is designed to demonstrate one or more of the University’s principles of undergraduate learning (PULs), with emphasis on PUL 2 and 3.

Expectations, Guidelines, and Policies

Homework Assignments

All assignments are posted under the Assignment Tab in Canvas. For the security reason, your assignment files should be uploaded in Canvas. As a last resort, and only if you are having trouble with the Assignments tab, you may send me an assignment through Canvas e-mail. When you need to turn in multiple files, please archive them together and only upload the archived file.
Here is a summary of the course assignments:

1. **Reading:** Reading materials from various sources will be assigned for each study unit. Although they will not be collected and graded, they are critical to your success in this course.

2. **Video courses** from Lynda.com: Video tutorials from the titles listed above will be assigned for each study unit to supplement course materials. Watching these video tutorials is required and essential to your success in this course.

3. **Lab exercises:** These exercises are designed to provide you with practical experience and help you understand the concepts and theories covered in lectures. They are built on walkthroughs and include variations to enhance independent learning. Some of the exercises provide detailed instructions; while others provide less detailed instructions and require you to apply the materials presented in class with less guidance.

4. **Final project:** This comprehensive team project will demonstrate a student’s ability to design and develop a Web application from the idea phase to implementation. The project consists of three components: coding, documentation, and presentation. Detailed instructions will be available later in the semester.

**Quizzes**

There will be several short quizzes throughout the semester. Quizzes assess your understanding of materials covered in lectures and homework assignments. Quizzes will usually be given during lab sections on Thursdays.

**Midterm Exam**

There will be one midterm exam over the materials covered in the first half of the semester. The exam will consist of multiple choice, true/false, fill in the blank, and short answer/essay. Questions may be drawn from PPT slides, assigned video tutorials, class activities, and reading assignments. There will be no written final exams.

**Tentative Weekly Schedule**

<table>
<thead>
<tr>
<th>Week #</th>
<th>Topics</th>
<th>Lab</th>
<th>Quiz/Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Welcome to I211</td>
<td></td>
<td>Syllabus quiz</td>
</tr>
<tr>
<td></td>
<td>• Introduction to OOP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>• Introduction to OOP</td>
<td>Lab 1</td>
<td>Quiz 1</td>
</tr>
<tr>
<td>3</td>
<td>• Introduction to OOP</td>
<td>Lab 2</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>4</td>
<td>• Real-world OOP (I): AJAX and XML</td>
<td>Lab 3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>• Real-world OOP (I): AJAX and XML</td>
<td>Lab 4</td>
<td>Quiz 3</td>
</tr>
<tr>
<td>6</td>
<td>Advanced OOP concepts and practices</td>
<td>Lab 5</td>
<td>Quiz 4</td>
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<tr>
<td>7</td>
<td>Advanced OOP concepts and practices</td>
<td>Lab 6</td>
<td>Quiz 5</td>
</tr>
<tr>
<td>8</td>
<td>Advanced OOP concepts and practices</td>
<td></td>
<td>Quiz 6</td>
</tr>
<tr>
<td>9</td>
<td>Advanced OOP concepts and practices</td>
<td>Lab 7</td>
<td>Midterm exam</td>
</tr>
<tr>
<td>10</td>
<td>Spring break.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Software design with MVC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Software design with MVC</td>
<td>Lab 8</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Real-world OOP (II): exception handling</td>
<td>Lab 9</td>
<td>Quiz 7</td>
</tr>
<tr>
<td>14</td>
<td>Real-world OOP (II): exception handling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>RAD with CodeIgniter</td>
<td>Lab 10</td>
<td>Quiz 8</td>
</tr>
<tr>
<td>16</td>
<td>Completing the final project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Presenting the final project</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Grading Schemes

<table>
<thead>
<tr>
<th>Activity</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class participation (Attendance, attitude, investment in course)</td>
<td>10</td>
</tr>
<tr>
<td>Lab exercises</td>
<td>20</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20</td>
</tr>
<tr>
<td>Midterm exam</td>
<td>20</td>
</tr>
<tr>
<td>Final project</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Minimum percentage for each letter grade:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Minimum %</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97</td>
<td>Professional level work, showing highest level of achievement</td>
</tr>
<tr>
<td>A</td>
<td>93</td>
<td>Extraordinarily high achievement, quality of work; shows command of the subject matter</td>
</tr>
<tr>
<td>A-</td>
<td>90</td>
<td>Excellent and thorough knowledge of the subject matter</td>
</tr>
<tr>
<td>Grade</td>
<td>Score</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>B+</td>
<td>87</td>
<td>Above average understanding of material and quality of work</td>
</tr>
<tr>
<td>B</td>
<td>83</td>
<td>Mastery and fulfillment of all course requirements; good, acceptable work</td>
</tr>
<tr>
<td>B-</td>
<td>80</td>
<td>Satisfactory quality of work</td>
</tr>
<tr>
<td>C+</td>
<td>77</td>
<td>Modestly acceptable performance and quality of work</td>
</tr>
<tr>
<td>C</td>
<td>73</td>
<td>Minimally acceptable performance and quality of work</td>
</tr>
<tr>
<td>C-</td>
<td>70</td>
<td>Unacceptable work (course must be repeated for credit)</td>
</tr>
<tr>
<td>D+</td>
<td>67</td>
<td>Unacceptable work (course must be repeated for credit)</td>
</tr>
<tr>
<td>D</td>
<td>63</td>
<td>Unacceptable work</td>
</tr>
<tr>
<td>D-</td>
<td>60</td>
<td>Unacceptable work</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>Unacceptable work</td>
</tr>
</tbody>
</table>

**Attendance Policy**

A basic requirement of this course is that you will participate in all class meetings and conscientiously complete all required course activities and assignments. Class attendance is required for this course. It entails being present and attentive for the entire class period. Attendance shall be taken in every class at https://www.indiana.edu/~i211/signin. If you do not sign in while in class, you shall be marked absent. The instructor is required to submit to the Registrar a record of student attendance, and action shall be taken if the record conveys a trend of absenteeism.

Only the following are acceptable excuses for absences:

- Death in the immediate family (e.g. mother, father, spouse, child, or sibling)
- Hospitalization or serious illness
- Jury duty; court ordered summons
- Religious holidays
- University/school coordinated athletic or scholastic activities
- An unanticipated event that would cause attendance to result in substantial hardship to one’s self or immediate family

Excused absences must be explained with the submission of appropriate documentation to the satisfaction of the instructor. Documents must be submitted to the instructor within one week of returning to class after the absence. Absences that do not satisfy the above criteria are considered unexcused. To protect your privacy, doctor’s excuses should exclude the nature of the condition and focus instead on how the condition impacts your attendance and academic performance.

Please note a minor illness such as cold or flu is not considered a valid excuse for missing a class. If you have a serious illness, a psychological disorder, or a chronic health condition, consider going through the Adaptive Educational Services (AES) office.
Missing class reduces your grade through the following grade reduction policy: You are allowed two excused or unexcused absences. Each additional absence, unless excused, results in a 2 points (out of 100 points) reduction in your final course grade. More than six absences result in an F in the course. Missing class may also reduce your grade by eliminating opportunities for class participation. For all absences, the student is responsible for all covered materials and assignments.

**Participation Policy**

Learning is not a passive process. All learning requires active participation. Participation is required in this course and is worth 10% of your course grade. Your participation is assessed in three areas (listed below) in addition to your attendance. Your expectations in these areas include:

- **Engagement**: Proactively and regularly volunteer, contribute to class discussion, ask relevant questions, or respond to others’ questions.
- **Attention**: Actively and respectfully listen to your instructor and peers and maintain full engagement throughout class.
- **Behavior**: Never display disruptive or inappropriate behavior in class and never use smart phone or laptop to conduct course unrelated activities.

**Assignment Policy**

This course may be difficult, and may involve concepts and terms you've never encountered. Budget your time accordingly. To ensure fairness to all students, no extra work, extra credit, or anything outside the regular homework and quizzes will be assigned.

Lab assignments are typically made available on Thursday at 10 pm and due Thursday of the following week at 10 pm. Exact due date and time will be included in the assignment instructions. Students are responsible for the deadline. Since you will turn in your labs by uploading files in Canvas, make sure you allow enough time for your files to travel to the Canvas server from your local computer. The following rules will apply to all assignments:

- To receive full credits, an assignment must be turned in by its deadline.
- A late assignment is acceptable if it is not more than one hour later than the deadline. A 40% penalty will be applied.
- Any work turned in more than one hour late is not acceptable.
- Partially completed work will be accepted for partial credits.
- The lowest homework assignment score is dropped.

**Quiz and Exam Policy**

All quizzes are closed book and timed. They must be completed in class. There will be no makeup quizzes. A missed quiz will result in a zero for that quiz. The lowest quiz score will be dropped.

The midterm exam is closed book and timed. The exam can be taken ONE time only. There will be NO makeup exams.

If you have to miss a quiz or an exam due to an excused absence, you may request to take the quiz or exam before the regularly scheduled date and time. This special accommodation must be requested at least one week in advance. No post-event accommodation will be granted.
Correction of Errors in Scores and Attendances

If a score or attendance is incorrectly recorded on Canvas or the Sign-in application, correction must be made within a week of the item posted. One week after an item is posted, it will not be changed. A maximum of two “I-forgot-to-sign-in” errors in the entire semester may be fixed. Your attendance report will display after you sign in every time. Be sure you carefully review your report and notify me via emails any discrepancy.

Honor Code

Passcode or password is used to ensure closed-book quiz, exam, or sign-in is completed in class. Leaking a password or passcode to allow someone to take the quiz or exam or to sign in outside class is against the course policies and a violation of Students Conduct code.

You may discuss your homework and projects with classmates. However, all submitted work must be your own. In the case of a group assignment, you must document who you worked with and describe the nature of your collaboration. Presenting other people’s work as your own without properly crediting the actual source constitutes fraud.

Plagiarism undermines the academic integrity of Indiana University. Plagiarism will not be tolerated. Any one detected as having been plagiarizing will be disciplined according to the IUPUI Student Code of Conduct. Multiple incidences of plagiarism may result in an F of the course grade. Academic misconduct will be reported using this form: http://studentaffairs.iupui.edu/doc/student-rights/academic-misconduct-reporting-form.pdf

Course Communications

Communication for this course will be administered via Canvas. All announcements, assignments, grades, emails, etc. will take place in that medium. Please refrain from relying on direct email for course-related questions to the instructor or TA if avoidable. The instructor should respond to emails within 48 hours, excluding weekends and holidays, and announce periods of extended absence in advance.

Incomplete

The instructor may assign an Incomplete (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an Incomplete automatically becomes an F after one year. For more information, please visit http://registrar.iupui.edu/incomp.html.

Use of Personal Electronic Device

“Personal electronic device” means any device that electronically communicates, sends, receives, stores, reproduces, or displays voice and/or text communication or data. These include, but are not limited to, cellular phones, pagers, smart phones, music and media players, gaming consoles, tablets, laptops, and personal digital assistants. Using such a device distracts the student using the device, his/her neighbors, and the professor. Additional, this usage is viewed as disrespectful to all others. The quality of the learning experience suffers when these discourteous distractions occur. Therefore, use of such a device is strictly prohibited when a class session is undertaking. They shall be kept out of sight and powered off
or silenced during a class meeting. If such a device must be kept on due to a special medical circumstance for self or family member, prior approval by the instructor shall be obtained. Use a tablet or laptop may be permitted if it is for taking notes or conducting instructional activities. Students should check with the instructor about permissible devices in class.

Right to Revise

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes and the nature of change(s) in Canvas.

Other Policies

IUPUI Course Policies: A number of campus policies governing IUPUI courses may be found at the following link: http://registrar.iupui.edu/course_policies.html.

Classroom Civility: To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones, engagement in private conversations and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, surfing the Internet, and posting to Facebook or Twitter during class are not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes “a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued” (IUPUI Strategic Initiative 9). IUPUI prohibits “discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or [veteran] status” (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.

Administrative Withdrawal Policy: A basic requirement of this course is that students participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, it is the student’s responsibility to inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund. Contact the instructor with questions concerning administrative withdrawal. For more information, please visit http://registrar.iupui.edu/withdrawal-policy.html.

Code of Conduct: All students should aspire to the highest standards of academic integrity. Using another student’s work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program. The Code of Academic Misconduct is
Accommodation Statement: Students needing accommodations because of a disability need to register with Adaptive Educational Services (AES) office and complete appropriate forms issued by AES before accommodations will be given. The AES office is located in Taylor Hall, UC 100. You can also reach the office by calling 274-3241.

If you need any special accommodation, please talk to the instructor in the first or second week of the semester. Requests for post-event accommodations will not be approved. In other words, if you do not request accommodations prior to a test or the deadline of an assignment, you may not after the fact get accommodations such as changing a grade, dropping a test, retaking the test, or extending the deadline of the assignment.

For more information, please visit the official web site of the IUPUI Adaptive Educational Services office at http://aes.iupui.edu/.

Emergency Preparedness: Safety on campus is everyone’s responsibility. Know what to do in an emergency so that you can protect yourself and others. For specific information, visit the emergency management website at http://protect.iu.edu/emergency.

Bringing children to class: To ensure an effective learning environment, children are not permitted to attend class with their parents, guardians, or childcare providers.

Mission Statement

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI’s mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University’s Strategic Directions Charter.

Statement of Values

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana’s capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and
professional development of its students, faculty, and staff and to continuous improvement of its programs and services.