IUPUI

SCHOOL OF INFORMATICS AND COMPUTING

DEPARTMENT OF HUMAN-CENTERED COMPUTING

Indiana University–Purdue University
Indianapolis

Syllabus

NEWM N434
Serious Games and Simulations

Department of Human-Centered Computing
Indiana University School of Informatics and Computing, Indianapolis
Spring 2017

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Department of Human-Centered Computing
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Spring 2017

Section No: **27962** *Credit Hours:* **3**
Day & Time:
Location: IT 256, Informatics & Communications Technology Complex
535 West Michigan Street, Indianapolis, IN 46202 [map]
First Class:
Website: https://canvas.iu.edu/…
Instructor: Prof. Joseph Defazio, Ph.D.
Office Hours: Mondays, 3–5 pm; Wednesdays, 3–5 pm; or by appointment
Office: IT 465
Office Phone: (317) 278-4148
Email: Use Canvas email
Website: http://soic.iupui.edu/people/joseph-defazio/
Prerequisites: None

Course Description:

This course examines the use of serious games, simulations, and virtual worlds in education, healthcare, health education, and the military. Students research and deconstruct successful serious games and simulations and design, implement, and evaluate their own serious game or simulation as well as create learning outcomes and evaluation metrics.

Extended Course Description:

Serious games and simulations have found their niche' in the education, healthcare, health education and military genres. This course examines several aspects and comparisons of the use of serious games including simulations and virtual worlds in multiple domains. This course explores the work of notable authors and serious game and simulation developers. Students will analyze, design, develop and evaluate the effectiveness of a serious game or simulation. We will adopt a reflective practice and creative process for this course. This course is intended to be a fast-paced, building a serious game or simulation from the ground-up focusing on design for specific learn objectives in serious game play. We focus on human-computer interaction, integration, and media design.

Required Textbook:

Salen, K. and Zimmerman, E. (2004). *Rules of Play - Game Design Fundamentals.* Massachusetts Institute of Technology (Available in a PDF through Canvas).

Recommended Textbooks:

Aldrich, Clark. (2009). *The Complete Guide to Simulations and Serious Games*. San Francisco, CA: John Wiley & Sons Inc. ISBN: 978-0-470-46273-7 http://www.amazon.com/dp/0470462736

Bergeron, Bryan. (2002). *Developing Serious Games.* Boston, MA: Addison-Wesley. ISBN: 0-201-72898-2 http://www.amazon.com/dp/1584504447

Abt, Clark C. (1987). *Serious Games.* Lanham, MD: University Press of America. ISBN: 978-0819161482 http://www.amazon.com/dp/0819161470/

Recommended Video Tutorials:

http://www.lynda.com/sdk/Education-Higher-Education-tutorials/Gamification-Learning/173211-2.html

Software Education Sources: Books 24x7 http://www.ulib.iupui.edu/node/9054

Course Objectives:

- Demonstrate effective planning for a serious game or simulation
- Deconstruct an existing serious game or simulation
- Define specific metrics required to ensure an error-free serious game or simulation
- Develop a sound implementation strategy
- Produce a working serious game or simulation

Core Competencies:

The core competencies of this course include the following:

1. Research - analyze current state-of-the-art serious games and simulations
2. Digital media Production – demonstrate effective serious game creation
3. Communication/Team Building - demonstrate effective team-based communication and collaboration

IUPUI Principles of Undergraduate Learning:

The learning outcomes of this course are in alignment with the IUPUI principles of undergraduate learning:

- ***Critical thinking***: This will be engaged through assignments that ask you to apply your understanding of the readings in new contexts, such as a wiki project, and through critical analysis exercises.
- ***Integration and application of knowledge***: We will look at new media from a variety of contexts, and seek to understand how new media has developed in the integration of technology, culture and communication. We will then take that integrated understanding of new media and examine how it is applied by new media practitioners.

Teaching and Learning Methods

Learning Outcomes:

Upon completion of this course, the student will	***RBT**	**PUL**	**Assessment**
1. Learning Outcome 1 – Conduct research to analyze elements of existing serious games and simulations.	**Analyzing:** *analyzes, breaks down, compare, and contrast* Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	PUL 1A: Core Communication: Written, Oral, and Visual Skills PUL 2: Critical Thinking	Assignment 1&5: Develop a Visual Algorithm
2. Learning Outcome 2 - Apply principles of aesthetics and design in the development of a serious game/simulation.	**Applying:** *applies, changes, constructs, demonstrates, modifies, prepares, produces, shows* Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place.	**PUL 4.** Intellectual Depth, Breadth, and Adaptiveness **PUL 1A:** Core Communication: Written, Oral, and Visual Skills	Assignment 2&6 The Story – Serious Game/Simulation 1. Assignment 3&7 Storyboard Creation
3. Learning Outcome 3 - Demonstrate understanding and knowledge of serious game/simulation development.	**Understanding:** Written Communication *applies, changes, constructs, demonstrates, modifies, prepares, produces, shows*	**PUL 2:** Critical Thinking **PUL 1A:** Core Communication: Written, Oral, and Visual Skills	Assignment 4&8 Prototype and Visual Algorithm

*RBT: Revised Bloom's Taxonomy

Teaching and Learning Methods

Project-based learning, Team-based learning

Class Structure – Topics

- Course Overview – Class Management, SOIC Resources
- Expectations
- Theories and Concepts in Serious Game Design and Development
- Serious Game/Simulation Design and Development
- Gamification
- Game Production Assessment and Evaluation

Course Deliverables – Expectations/Guidelines/Policies:

This class meets (1) time per week. You are expected to attend every class. Attendance is required. Failure to attend class could result in a reduction or failing grade. At each class session, an attendance roster will be passed around the class. Your initials are confirmation that you will receive credit for that day's attendance. (10 points if you attend, 0 points if you miss). At the end of the semester, your attendance score will be calculated and scored into your final grade for this course.

- ***Readings:*** There will be several reading assignments required as part of this class. Students will be expected to engage in class discussion on issues related to each chapter readings from the textbook and several articles selected for discussion. Articles will be posted in the Resource Section of Canvas.
- ***Assignments:*** Game design assignments are a critical part of this course. Game design includes, developing a visual algorithm, create a story, creating storyboards, developing assets, flowcharts, setting goals, etc. Each student will complete assignments that will be used toward developing a serious game/simulation as a requirement for this course.
- ***Presentations:*** Each student will design, develop and present a series of presentations in the area of serious game/simulation design and development. Presentations will consist of solo and/or team based formats. Presentations will be graded on clarity, structure, grammar, spelling, and peer review.
- ***Final Project and Presentation:*** There will be one final project. You are expected to produce a quality serious game using one of the software platforms discussed in class. Each student should strive to develop the work to be added to your portfolio. All projects will be graded based upon comprehensiveness, creativity, effectiveness, execution, adherence to your production schedule, and your ability to follow instructions.

Grading Information:

- Requirements (homework/reading assignments, quizzes, final project and solo/team project presentations and attendance
  Failure to complete any of these requirements could result in a failing grade.
- The final serious game/simulation project grade will be based on quality, execution, production, peer review, and instructor evaluation.

Grading Scale

Attendance	140 points
Assignment 1: Develop a Visual Algorithm	50 points
Assignment 2: The Story – Serious Game/Simulation 1	50 points
Assignment 3: Formal Storyboard Presentation for Game 1	50 points
Assignment 4: First Prototype with Visual Algorithm	100 points
Peer Evaluation Game 1 Presentation	100 points
Assignment 5: Develop a Visual Algorithm	50 points
Assignment 6: The Story – Serious Game/Simulation 2	50 points
Assignment 7: Formal Storyboard Presentation for Game 2	50 points
Assignment 8: Second Prototype with Visual Algorithm	100 points
Final Project (Game 2) Deliverable and Presentation	200 points

Total Possible Points **940 points**

Grading scale [points]

875 – 940 = A
780 – 874 = B
760 – 779 = C
685 – 759 = D
0 – 684 = F

Weekly Schedule:

The Weekly Schedule is available through Canvas and is subject to change. The instructor will notify students in the event changes are made. The Weekly Scheduled is available as a PDF in the Syllabus Section of Canvas.

Equipment Recommendations:

A computer is the core productivity tool for technology-based learning. The portability of a laptop computer is required for this course. Each student should begin making plans for this addition to one's learning resources. Either a Windows or Mac platform is acceptable. Further information can be obtained through our technology services office and Kim Melluck at kmelluck@iupui.edu. IUPUI has information through UITS on computer purchasing to help meet this need.

Class Attendance (Monday Evening – Lecture/Lab):

Class attendance is crucial to your success in this course. If you have a documented family or medical emergency, you must notify your Professor and Teaching Assistant as soon as possible, so that you can receive an excused absence. Please note: you must turn in documentation in order to receive an excused absence. You will be allowed one unexcused absence this semester. After you first absence, each additional unexcused absence will negatively affect your FINAL GRADE. Multiple unexcused absences will result in your failure of the class. Your signature is confirmation that you will receive credit for that lecture's attendance.

Class Delivery:

This class meets on Monday evenings from 6pm – 8:40pm. In general, the first hour-and-a-half (6:00pm -7:30pm) is devoted to lectures and presentations. There will be a 10 minute break (7:30pm – 7:40pm). The remaining time will be devoted to lab time. Students are strongly encouraged to use this time to work on assignments and projects and engage in dialogue with the instructor and their classmates.

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Class attendance is required for classroom-based courses. It entails being present and attentive for the entire class period. Attendance shall be taken in every class. If you do not sign the attendance sheet while in class, you shall be marked absent. Signing the attendance sheet for another student is prohibited. 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 holiday; 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. Absences must be explained with the submission of appropriate documentation to the satisfaction of the instructor, who will decide whether missed work may be made up. 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.

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 5% 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.

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. http://registrar.iupui.edu/incomp.html

Deliverables:

You are responsible for completing each deliverable (e.g., assignment, quiz) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through Canvas. Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

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.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code* > *Responsibilities* > *Academic Misconduct* at http://www.indiana.edu/~code/. All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorial and Test. https://www.indiana.edu/~istd You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. http://www.ulib.iupui.edu/libinfo/turnitin

Academic Misconduct:

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
    a. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
    b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare

work, without advanced authorization from the instructor to whom the work is being submitted.

c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.

d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.

e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.

f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.

g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.

h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.

2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.

3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.

   a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.

   b. A student must give credit to the originality of others and acknowledge indebtedness whenever:

      1. directly quoting another person's actual words, whether oral or written;
      2. using another person's ideas, opinions, or theories;
      3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
      4. borrowing facts, statistics, or illustrative material; or
      5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment

4. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.

5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials

that are rationally related to the content of the course or to the enhancement of the learning process in the course.

6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
2. **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
3. **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 generally 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.
4. **Bringing children to class:** To ensure an effective learning environment, children are not permitted to attend class with their parents, guardians, or childcare providers.
5. **Course Evaluations:** Course evaluations provide vital information for improving the quality of courses and programs. Students are urged to complete one course and instructor evaluation for each section in which they are enrolled at the School of Informatics and Computing with the following three exceptions: (a) The student has withdrawn from the course; (b) fewer than five students are enrolled in the section (in which case anonymity is impossible); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at https://soic.iupui.edu/app/course-eval/. Course evaluations are open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades for the

course. In small sections, demographic information should be left blank, if it could be used to identify the student.

6. **Communication:** For classroom-based courses, instructor or teaching assistant should respond to emails by the end of the next class or, for online courses, within two Indiana University working days, which excludes weekends and holidays. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.
7. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily for pertinent information. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
8. **Disabilities Policy:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). Visit http://aes.iupui.edu for more information.
9. **Administrative Withdrawal:** 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.
10. **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. http://protect.iu.edu/emergency
11. **Student Advocate:** The Student Advocate provides assistance to students with personal, financial, and academic issues. The Student Advocate Office is located in the Campus Center, Suite 350. The Student Advocate may also be contacted by phone at 317 274-4431 or by email at studvoc@iupui.edu. For more information visit http://studentaffairs.iupui.edu/advocate.
12. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the CAPS office by phone at 274-2548 or email at capsindy@iupui.edu. For more information visit http://life.iupui.edu/caps/.

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.