EDUC 475/698A
Mindtools for Investigation and Education

SYLLABUS

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Credits:	3 credit

Catalogue Description:
Explore educational games, simulations and computer modeling platforms common to many domains from a variety of fields. Focus on design and research issues pertinent to learning through simulations and games.

Course Description:
The field of instructional/educational technology has witnessed tremendous growth in research and development of interactive multimedia learning environments in recent years, especially computer-based environments. At the same time, there has been increased openness in the field to consider the influence of a constructivist philosophy of learning on instructional design decisions (Duffy & Jonassen, 1992). Researchers and developers are struggling to find innovative ways to exploit the interactive potential of the learning environments afforded by technology while remaining consistent with the practicalities of learning in schools and the work place (Hannafin, 1992; Hannafin & Rieber, 1989a, 1989b). The flurry of educational software and applications and the widespread popularity of "edutainment" software like SimCity, Civilization, Carlo Santiago, and MathBlaster gives a clear indication of the extent to which simulation games have permeated popular culture and classroom. However, researchers and educators are trying to ascertain what and how students learn from these environments.

In this project-based course, students from all disciplines are encouraged to understand how we learn from education technologies, develop and investigate systems and ideas from their fields of study, and delve into the process of building and testing games, robotics, and simulations. In the first part of the course we will explore the design and use of games and simulations in the classroom, and the research and development issues associated with this software. We will then explore various modeling and simulation software packages, criteria for developing the most appropriate simulation for a given situation, and methods for evaluating the success and utility of models. We will also study what and how people learn from simulations (including field testing of software), and how modeling and simulation tools can be implemented in educational settings. All levels of computer experience welcome.

This course was specifically designed to address Maryland Teacher Technology Standard (MTTS) **V. Integrating Technology into the Curriculum and Instruction**
Design, implement and assess learning experiences that incorporate use of technology in a curriculum-related instructional activity to support understanding, inquiry, problem solving, communication and/or collaboration.

Addressing all 7 indicators:
1. Assess students' learning/ instructional needs to identify the appropriate technology for instruction.
2. Evaluate technology materials and media to determine their most appropriate instructional use.
3. Select and apply research-based practices for integrating technology into instruction.
4. Use appropriate instructional strategies for integrating technology into instruction.
5. Select and use appropriate technology to support content-specific student learning outcomes.
6. Develop an appropriate assessment for measuring student outcomes through the use of technology.
7. Manage a technology-enhanced environment to maximize student learning.

Course Objectives:

Upon completing this course, participants will be able to:

1. Explore, analyze and evaluate a given educational game or simulation.
2. Decide what type of game or simulation (if any) would be an appropriate medium of instruction, given a set of objectives and a description of a learner group and context.
3. Use, where appropriate, selected psychological theories and models to describe motivational and affective aspects of instruction. The models will include the following: Csikszentmihalyi's flow model; Keller's ARCS model; Malone & Lepper's intrinsic motivation taxonomy.
4. Describe and explain selected issues, people, concepts and principles involved in the design of educational simulations and games using a Blog, WebCT discussion threads and chatroom as medium of communication.
5. Design an educational board game that is flexible and effective and document its rules, physical attributes, context of use, rationale, and variations.
6. Design a web-based decision-tree simulation which leads a learner through a sequence of difficult choices based on an authentic problem situation.
7. Design and document a technology-based educational simulation-game, using flowcharts, maps, and equations as appropriate as well as the motivational principles at work in the design.
8. Reflect on and explain the design processes you use in creating motivating educational products.

Readings:
Recommended readings are included in this syllabus. **Others** can be found at
www.edtechoutreach.umd.edu and within a WebCT supplement.

Texts:

To purchase:

1. Laramee, F. D. (Ed.) (2002). *Game design perspectives*. Hingham, MA: Charles River Media. ISBN: 1584500905. Amazon $26.37 or $18.80 used.

Methodology:

This course will utilize a combination of face to face and on-line lecture and reading materials, hands-on project based experiences, discussions, guest speakers, group work and projects to help participants understand how we learn from education technologies, develop and investigate systems and ideas from their fields of study, and delve into the process of building and testing games, robotics, and simulations.

Student Expectations and Procedures:
1. Students are expected to obtain and actively use a computer account with access to the Internet and WebCT discussion site (the University provides such accounts free to enrolled students.) Students are expected to use **anti-virus software and backup all work**. Since the course will sometimes meet on-line it is of importance that you assure that your computer access can easily support the WebCT environment. WebCT Student Manual - http://www.courses.umd.edu/studentmanual/
2. Completion of assigned tasks and readings **prior to each class** is required in order to facilitate student learning.
3. It is expected that students will initiate, participate in and facilitate (both in class and on-line) discussions on course topics, issues and readings. Please see the on-line discussion grading rubric.
4. **If you have a documented disability and wish to discuss academic accommodations please contact me as soon as possible.**
5. Students missing the deadline for an assignment must make immediate arrangements with the instructor to fulfill that requirement before the next class session.
6. Please carefully edit all written assignments. A lack of care in proofreading or composition can negatively affect your final grade.

7. The citation style employed should be accurate, acceptable, and recognizable (MLA, Chicago or APA) practice. The American Psychological Association (APA: http://www.apa.org) style of citation is preferred. For quick basics, visit:
   o Columbia University Press - http://www.columbia.edu/cu/cup/cgos/idx_basic.html
   o Harvard Writing Center Resources - http://www.fas.harvard.edu/~expos/index.cgi?section=resources
   o Purdue's Online Writing Lab (OWL) - http://owl.english.purdue.edu/
   o Rensselaer polytechnic Institute Writing Center - http://rpi.edu/web/writingcenter/handouts.html
   o University of Wisconsin-Madison Writing Center - http://www.wisc.edu/writing/
8. The University of Maryland has developed a policy describing appropriate academic conduct. Turning in assignments that use substantial portions of the work of others without attribution is considered plagiarizing and is specifically prohibited. Please review information regarding the Honor Code and other academic integrity policies at: http://www.jpo.umd.edu/conduct/conduct.html.

Instructor Responsibilities

Just as we have high expectations for students, we also have high expectations for ourselves. Students should expect that the instructor for this course will:

1. Be prepared for class, read and return students' work in a timely manner, and be interested and engaged in students' work;
2. Remember that each student brings different background knowledge about both content and online experiences to this course, as well as help students develop their personal interests whenever possible;
3. Help students identify sources of additional substantive and methodological expertise, as needed;
4. Meet with students individually or in groups upon request and be available in person, by telephone, and by email to answer questions; and
5. Work hard, have fun and empower students to plan and engage in high quality discussions and experiences.
6. Email with students is not always a low threshold technology. Students sometimes feel that faculty/instructors should be available to answer questions 24/7 or whenever the student is online. This expectation of an immediate response can occasionally create a negative communication environment. Students' emails can also add significantly to faculty/instructor workload. While my past performance has indicated that I return emails promptly (sometimes to students surprise within minutes), in order to eliminate the possibility of problems due to assumptions, the following is the course minimal guideline: All emails will be answered within 24 hours of receipt except on weekends (begins after 4:00 on Friday)- which may take longer. I do however; HIGHLY recommend that you send emails whenever a question arises, while the above is only a statement of minimal expectations on my part.

Grading Policy and Rubrics:

Grades will be based on the content, clarity of writing and creativity of work in assignments completed for this course. The extent and quality of participation in course discussions (face to face and virtual) will also be evaluated in determining the final grade. The relative portion of the grade assigned to each course component will include:

a. **Participation** in face to face/on-line WebCT discussions **(15%)**
b. Documentation and Presentation of an **Educational Board Game: Group Project (15%)**
c. **Microworlds Products**
   • Animated Story **(10%)**
   • Game/Maze **(10%)**
d. Designing Evaluation Criteria for Academic Simulations **(10%)**
   • **Wiki & Blogger contributions**
e. Online educational **templates/Excel mini-simulation (10%)**
f. **E-Game Analysis (10%)**
g. **E-Game Final Project**: Group Project Design and conduct an experiment on how people learn from one of the simulations that you have created **(20%)**

All deadlines will be detailed in the course outline.

The evaluation criteria for this course are described in more detail in the grading rubric.

The grading rubric describes participant performance expectations and efforts most valued. Professionalism, completeness, timeliness and quality are all considered in the evaluation process.

Educational Technology Outreach Grading Rubric

Letter Grade	Extent, Quality and Creativity of Work	Completeness of Work	Timelessness of work	Participation in discussions
A+	Exceptional Quality and insight; honors spirit of task; a rare and valuable contribution to understanding	100% complete (or beyond); a model for others to follow; honors spirit of task	100% on time	insightful, thoughtful and stimulating contributions to discussions; beyond what is normally expected; 100%
A	Convincingly on target with the purpose of the assignment; evidence of growth; learning difficult to refute; worthy contribution to our understanding; reader not distracted by errors in grammar, writing flow, spelling or punctuation	What is missing may not be missed; accurate; a whole product	Almost always on time; rare but forgivable tardiness	Thought provoking discussions; 100% contribution
A-	Fulfills all primary requirements of the assignment; some evidence of growth; learning difficult to refute; contribution to our understanding; reader not distracted by errors in grammar, writing flow, spelling or punctuation	A whole product but lacks "the extras"; accurate; on target with regard to task	Almost always on time; rare but forgivable tardiness	At least 95% contribution to discussions; dialogue thoughtful and insightful but lacks vigor or conviction
B+/B	Competent and worthy; provides credible evidence of learning and growth; may not completely honor spirit of task; perhaps an "off-day"; errors of grammar, spelling, punctuation distract the reader	Moderate shortcomings; minor elements missing; affects instructor's ability to see the product as a whole	Late and/or often enough to alarm instructor; not necessarily chronic	Moderate participation with some insightful comments
B-	Passable; only enough to get by; needs more proofreading or writing skills	Sufficient; least you could do and justify	Some tasks could be late	Barely participates in discussion; class contributions add little insightfulness and do not provoke further discussion
C	Undergraduate level/quality; unsophisticated; exhibits little course concept or concepts	Evidence of learning or growth insufficient	Excessively or repeatedly late	Limited participation in discussion; Little if any preparation or thought in dialogue
F	Unacceptable	Difficult to recognize as the assigned task or not turned in at all	Missing/not submitted	Little if any participation in discussions