

Detailed Course Descriptions for the Michigan State University Graduate Certificate in Serious Games

Scroll down to see descriptions of TC830: Foundations of Serious Games, TC831: Theories of Games and Interaction for Design, and TC841: Understanding Users.

For more information about the graduate certificate program, please visit <http://seriousgames.msu.edu> or contact the program coordinator, Professor Carrie Heeter (heeter@msu.edu)



TC830: Foundations of Serious Games

Become a serious game monster

Overview

TC830 gives students a high level view of the major flavors of serious games, including many current and historical examples, the range of kinds of games in those domains, who makes them, and funding and design constraints. The course also provides nuts and bolts understanding from the perspective of a (serious) game designer, so that students can recognize and even envision the different elements that games are composed of as well as the process and progression from problem statement to game concepts, core mechanics, visualization, testing, and iteration. Students who are already game designers explore familiar ideas with a serious twist. Students new to game design learn about game design and game components for the first time.

Assignments

Experiential learning comes from engaging in a series of four short (one-week) “gamelab” assignments culminating in a multipart “Epic Quest” project. Depending upon their learning goals, students can choose to 1.) design and develop a rough prototype serious board or card game, 2.) develop and test pre- and post-game activities to enhance learning from an existing commercial or educational game, or 3.) gamify an serious online activity.

Assignments	
10%	Reflections and Participation (most weeks)
	Serious Game Design Labs
5%	1: Propose a small ADAPTATION to turn an existing entertainment game into a serious game
5%	2: Invent two one-paragraph Serious Game CONCEPTS
10%	3: Invent a new game concept and VISUALIZE the CORE MECHANIC
10%	4: WIZARD of OZ test and ITERATE (revise) your core mechanic

	Epic Quest
5%	Part 1: PITCH Final project idea
15%	Part 2: PLAYTEST Report
15%	Part 3: REFINED PITCH based on audience and content research
25%	Part 4: Video describing gameplay and game web site

Personalization

Students in the graduate certificate in serious games programs often come to the program with specific interest in a particular branch of serious games, such as games for health, games for learning, games for social change, corporate games, etc. You can adapt most assignments to the domain of greatest personal or professional interest.

We appreciate that our students come to the program with an exciting range of life, education, and work experiences. Many of you know more than the instructors about certain topics. We use Google Groups and encourage “citizenship” (sharing your wisdom and interesting links and games) with your classmates. Students also post responses to selected weekly “reflection topics” related to course topics. (Reflections can be as short or as long as you wish.)

Course Topics

Two textbooks were used in Spring 2013, supplemented by carefully selected outside links and readings. Assigned readings are different each time the course is offered.

Playful Design: Creating game experiences in everyday interfaces

By John Ferrara

Video Games and Learning: Teaching and participatory culture in the digital age

By Kurt Squire

Original mini-lectures (ranging from 10 to 40 minutes) on most major topics combine with textbook readings, outside readings and links are used to address the topics listed in the outline below.

2013 Course Topics, Textbook Readings by Week

	High Level View of Major “Flavors” of Serious Games	Nuts & Bolts: Conceptualizing and Designing Serious Games	Spring 2013 Textbook Readings (some VGL chapters are optional)
Week 1	Welcome and Course Overview Defining Serious Games	Designing Serious Games	PD-1: Why Should We Care about Games? VGL-1: Possible Worlds PD-2: Understanding Games
Week 2	“Big G” Games	Serious Game Design Progression (concepts -> Visualizations -> Prototypes) Brainstorming Serious Game Concepts	PD-6: Developing a Game Concept VGL-4: Community Organizing for Participatory Learning

Week 3	Frameworks for Analyzing Serious Games	Serious Game Core Mechanics & System Dynamics	PD-3: Elements of Player Experience PD-10: Rewards in Games
Week 4	Games for Health	Wizard of Oz testing Core Mechanics	PD-9: Behavioral Tools
Week 5	Games for Learning	Designing Serious Board & Card Games	PD-12: Games for Learning *VGL-2: Ideological Worlds *VGL-3: Teaching with Games
Week 6	Learning from Games	Accessibility & Serious Games	VGL-5: Games-To-Teach VGL-6: Games in the Classroom
Week 7	Corporate Games	Pitching Serious Games	
Week 8 Feb 27	Games for Change	Paper Prototyping	PD-7: Creating Game Prototypes PD-13: Games for Persuasion
Week 9		Playtesting Serious Games	PD-8: Playtesting *LVG-9: Games Go to School PD-5: 10 Tips for Building a Better Game
Week 10	News & Current Event Games	Forms of Fun	PD-11: Games for Action LVG-8: Design Literacy
Week 11	Military Games		PD-4: Player Motivations LVG-7: The Aesthetics of Play
Week 12	Gamification		LVG-10: The Future of Games for Learning
Week 13		Values in Games	
Week 14		Budgeting Serious Games Gender & Games	PD-14: How Games are Changing
Week 15		Getting a Job in the (Serious) Game Industry	



TC831: Theories of Games and Interaction for Design

Become a serious game ninja

Overview

TC831 will introduce future designers and researchers as well educators who plan to incorporate serious games and interactive technologies in the classes to a wide range of theories that may inform the design, research, and application of serious games and interactive technologies. These include theories of learning and motivation, persuasion, attitude and behavior change, and theories of fun and play, which are applicable to a range of domains, including classroom-based and informal learning, health-related individual behavior change, and social change.

In the spirit of game design, this class uses game terminologies and mechanics. Players (students) under the guidance of mentors (instructor) take quests (assignments) to earn experience points (XPs) to advance their Level (grade).

Online Format

"The Perilous Realms"

This is an online class. As such, there is no set class meeting times. Instead, the mentor posts weekly content, quests, and challenges for the players.

Players are expected to frequently check the class website, actively engage in online discussions, and keep up with readings and other assignments.

Online classes area a great opportunity for people with diverse backgrounds to come together in order to work, learn, and even play. Many Players thrive in this new format. However, some Players are caught off guard by the structure and lack of formal meeting times. Avoid procrastination and ask lots of questions!

Assignments

Category	Points	Description
Meditations	2000	Weekly short papers on the presented content
Inquiries	1000	Weekly questions on presented content
Dialogs	1000	Weekly responses to Player Inquiries.
Reflection Quests	1000	One reading paper/presentation OR ELSE One game/interactive technology presentation
Epic Quest (Project Proposal)	3000	A proposal for a theory/research driven game design.

Course Topics by Week

WK	Road Map	Theories & Topics
1	Introduction to theory Serious Games in general	Welcome to Program (Heeter) Welcome to Class (Shaw) Why is a theory? What is a game? What makes games “serious”?
2	Introduction to theory Serious Games in general	Overview of serious games Serious game genres Ritterfeld research model of fun
3	Game Based Learning I	Learning Theories and Frameworks: <ul style="list-style-type: none"> • Assimilation and Accommodation (Piaget) • Developmental Learning (Piaget) • Zone of Proximal Development (Vygotsky) • Behaviorism (Skinner) • Facts, Concepts, and Schemas • Constructivism (Papert) • Experiential Learning • Multiple Intelligences (Gardner) • Socially Constructed Knowledge • Collaborative Learning, Distributed Cognition, Collective Intelligence • Transference
4	Game Based Learning II	Learning Outcomes <ul style="list-style-type: none"> • Facts, Concepts, Processes, Skills • Values • Schemas • Mastery • Habits of Mind (such as systems thinking, computational thinking, design thinking, critical thinking) • Resilience • Self-Efficacy/Collective-Efficacy Mediating Factors <ul style="list-style-type: none"> • Learning enhancers (intrinsic & extrinsic motivation, scaffolding, feedback & assessment, competition, cooperation, pedagogical agents, authentic learning, embodied learning, situated learning) • Potential inhibitors (stereotype threat, mindset)
5	Introduction to Research	Concepts in research papers Theory driven game design
6	Theories of Behavior I	Theories of Behavior Part 1: Health Belief Model, Stage of Change, Theory of Planned Behavior, Social Cognitive Theory
7	Theories of Behavior II	Theories of Behavior Part 2: Community Organization, Diffusion of innovation, Media Effects Putting Theory into Practice Using Planning Models
8	Theories of Behavior III	Theories: Self-determination theory Topics: Planning a research study

		Topics: Budgeting
9	Evaluation	Topics: Evaluation plan (feasibility, acceptability, usability, effectiveness) Topics: IRB and logistics
10	Persuasion	Games for social change Theories of persuasion Culture
11	Serious game implementation challenges	Serious game implementation challenges
12	Take Home Exam	"Boss Fight" (take home exam) Thanksgiving Week
13	Other emerging educational serious games	Other emerging educational serious games
14	Gamification	Defining Gamification User-Centered Gamification Theories

Fall 2012 Reading List

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- Baranowski, T., Baranowski, J., Thompson, D. I., Buday, R., Jago, R., Griffith, M. J., et al. (2011). Video game play, child diet, and physical activity behavior change: A randomized clinical trial. *American Journal of Preventive Medicine, 40*, 33-38.
- Baranowski, T., Baranowski, J., Thompson, D. I., & Buday, R. (2011). Behavioral science in video games for children's diet and physical activity change: Key research needs. *Journal of Diabetes Science and Technology, 5*, 229-233.

- Berkovsky, S., Coombe, M., Freyne, J., Bhandari, D., & Baghaei, N. (2010). *Physical activity motivating games: Virtual rewards for real activity*. Paper presented at the CHI '10.
- Bogost, I. (2008). [The rhetoric of video games](#). In K. Salen (Eds.), *The ecology of games: Connecting youth, games, and learning* (pp. 117-140). Cambridge, MA: The MIT Press.
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- Briggs, R. O. (2006). On theory-driven design and development of collaboration systems. *International Journal of Human-Computer Studies*, 64, 573-582.
- Connolly, T. M., Stansfield, M., & Hainey, T. (2011). An alternate reality game for language learning: ARGuing for multilingual motivation. *Computers & Education*, 57(1), 1389-1415.
- Consolvo, S., McDonald, D. W., & Landay, J. A. (2009). *Theory-driven design strategies for technologies that support behavior change in everyday life*. Paper presented at the 2009 annual conference on Human factors in computing systems (CHI'09), Boston, MA.
- Daley, A. J. (2009). Can Exergaming Contribute to Improving Physical Activity Levels and Health Outcomes in Children? *Pediatrics*, 124, 763-771.
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness: Defining "Gamification." Proceedings of the 15th International Academic MindTrek Conference , September, Tampere, Finland.
<http://dl.dropbox.com/u/220532/p9-deterding.pdf>
- Garza, M., Chamberlin, B., Gleason, J., Muise, A., & Gallagher, R. (2012). Year-End Review of Exergaming Research. (Annotated bibliography).
<http://www.slideshare.net/nmsumediaproductions/year-in-exergames-research-review>
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- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81-112.
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- Isbister, K., Flanagan, M., & Hash, C. (2010). *Designing games for learning: Insights from conversations with designers*. Paper presented at the 28th ACM Conference on Human Factors in Computing Systems (CHI'10).
- Kafai, Y. B. (2009). Serious games for girls? Considering gender in learning with digital games. In U. Ritterfeld, M. Cody, & P. Vorderer (Eds.). (2009). *Serious games: Mechanisms and effects* (pp. 221-235). New York: Routledge.
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- Kato, P. M., Cole, S. W., Bradlyn, A. S., & Pollock, B. H. (2008). A video game improves behavioral outcomes in adolescents and young adults with cancer: A randomized trial.

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- Nicholson, S. (2012). A User-Centered Theoretical Framework for Meaningful Gamification. Paper Presented at *Games+Learning+Society 8.0*, Madison, WI. <http://scottnicholson.com/pubs/meaningfulframework.pdf>
- Oinas-Kukkonen, H., & Harjumaa, M. (2008). *A systematic framework for designing and evaluating persuasive systems*. Paper presented at the The 3rd International Conference on Persuasive Technology (Persuasive '08), Oulu, Finland.
- Peng, W. (2009). Design and evaluation of a computer game to promote a healthy diet for young adults. *Health Communication*, 24, 115-127.
- Pinelle, D., Wong, N., & Stach, T. (2008). *Heuristic evaluation for games: Usability principle for video game design*. Paper presented at the The 26th ACM Conference on Human Factors in Computing Systems (CHI '06).
- Prensky, M. (2001). *Digital game-based learning*. New York: McGraw-Hill.
- Ravaja, N., Kivikangas, M. (2009). Designing game research: Addressing questions of validity. In U. Ritterfeld, M. Cody, & P. Vorderer (Eds.). (2009). *Serious games: Mechanisms and effects* (pp. 404-410). New York: Routledge.
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- Shape up. (2012). *Report: How to add social networking to your wellness program*. Retrieved July 20, 2012, from <http://www.shapeup.com/>
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TC841: Understanding Users

Become a design research wizard!

Overview

Understanding users is an essential practice for those who hope to design impactful, high quality serious games. TC841 is a hands on, project-based class in which you will learn about and apply the process of human-centered game design, learning about an applying many different user experience design research techniques. The class also teaches how to draw insights from this research, and how to write reports for designers to communicate your findings to the game design team. Design research includes pre-production, mid-production and post-production research and encompasses qualitative and quantitative methods for understanding users.

The design research methods discussed in TC841 include secondary research, persona analysis, scenarios, ethnographic research, individual interviews, focus group interviews, paper prototyping, card sort analysis, participatory design, playtesting, usability testing, remote research, heuristic analysis, behavior metrics, physiological measures, experimental design research, competitive analysis, and impact research.

Personalization

Students in the graduate certificate in serious games programs often come to the program with specific interest in a particular branch of serious games, such as games for health, games for learning, games for social change, corporate games, etc. You can adapt most assignments to the domain of greatest personal or professional interest.

Assignments

There will be two small and four major graded assignments, each associated with the semester-long **Human Centered Design Innovation Project**. Students develop an initial project vision grounded in a design challenge on a topic of their choosing (an important problem that a serious game could help to address). You then conduct design research to understand your target players, create and playtest a rough paper prototype, conduct a competitive analysis of related works, and revise and refine your project vision, applying the research methods learned in TC841.

	% of Grade
REFLECT & REACT	
Reflections and Citizenship	10%
Human Centered Design Project	
Initial Project Vision	10%
Ethnographic & Interview Research	25%
Playtest or Focus Group Report	15%
Competitive Analysis	30%
Final Project Vision	10%
TOTAL	100%

Course Topics

Fall 2012 Textbooks

1. Design Research, edited by Brenda Laurel (“DR”) and
2. Game Usability edited by Katherine Isbister and Noah Schaffer (“GU”)

Original mini-lectures (ranging from 10 to 40 minutes) on most major topics combine with textbook readings, outside readings and links to address the topics listed in the outline below.

Fall 2012 Course Topics by Week

Week	Topic
1	Orientation
	Intro to User Experience Design (UXD)
2	Protecting Human Subjects
	Defining the Design Challenge
3	Persona Analysis
	Sampling for UXD Research
4	Scenarios for Serious Game UXD Research
	Secondary Research
5	Ethnographic Research
6	Surveys and Interviews
7	Prototyping & Iterative Design
	Card Sort Analysis
8	Focus Group Interviews
9	Playtesting
	Usability Testing
	Remote Research
10	Heuristic Analysis

	Expert Analysis
11	Competitive Analysis
12	Iterative Design
	Participatory Design
13	Careers in Design Research
	Impact Research
	Metrics
14	Physiological Measures
15	Experimental UXD Research