3D Game Programming using Microsoft's XNA Game Studio 4.0
## Syllabus
17 January 2013
Dr. Kris Stewart

CS 583 3D Game Programming for Simulation
Prerequisites: CS 310 Data Structures or equivalent programming experience. A useful review of data structures, focused on game development, is available from the XNA Creators Club, online from Bb.

All students enrolled in CS 583 will be set up with access to the Microsoft Developers Network Academic Alliance by the instructor. This will provide you with Microsoft's Visual Studio 2010 Pro class development.   Please come by office hours for this.

Text: Learning XNA 4.0, **by:** Aaron Reed O'Reilly Media, Inc., December 2010
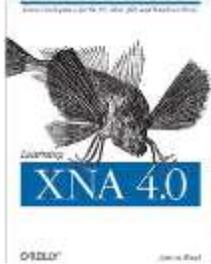
Get unofficial code here http://www.aaronreed.com/dnn/LearningXNA40.aspx

Instructor: Professor Kris Stewart, GMCS 535
Phone: 4-7243
CS Dept Phone: 4-6191
Office hours: Mon Wed 10-11:30a in GMCS 408 our lab - and by apt
Email stewart@rohan.sdsu.edu   Be sure to put CS 583 and topic in the subject field of your email. Also please sign your message at end with your First and Last name, as registered SDSU.
Website: Class will use Blackboard extensively
Classroom/Lab: AH1112 lecture; Student PC/Xbox360 Lab in GMCS 408

Course Goals: To provide an opportunity for students to obtain the knowledge and skills necessary to create 3D multiplayer games incorporating:
- Programming in C#
- 3Dmodels of players, vehicles, items, and structures
- 2D and 3D graphics, audio and music; graphical user interfaces and menus
- Environmental effects
- Outdoor terrain

Student Learning Outcomes:
1. Students use the large, complex software environment provided by the game API to develop their Object Oriented Programming skills
2. Students develop communication skills through course exercises and assignments to be able to describe a complex software project to a general audiences.

3. Students work effectively as a member of a group to create a software product.
4. Students learn the capabilities and responsibilities of using the campus computer network and computer labs.

Upon conclusion of this course, students will be able to:
- Create client-server scripts using Visual C# 2010 and XNA4.0
- Create game play features using Visual C# 2010 and XNA 4.0
- Obtain, evaluate and incorporate 3d models or Create 3d models with 3d tools
- Integrate art and models into a game world

Class Schedule Description:
+ Framework for 3D game development with identification of roles needed in development team.
+ Development of programming skills with C# and XNA and examination of 3d concepts for game modeling and programming.
+ Game Studio for control of objects and interactions in 2D and 3D game worlds.

Attendance: Students are expected to be present and punctual for all scheduled classes and labs.

Dropping a Class: The student is responsible for understanding the procedure for dropping a class. If you fail to attend classes but do not follow the procedure for dropping the class, you may receive a failing grade.

Grading Rationale:
In this class, students will be evaluated according to performance in the following categories:

An individual 2D game project (based on chapters 1-8 of text). Students who are majors other than CS, please see instructor to fashion an equivalent effort project using your training.
An individual research paper on a topic related to game programming (with peer-reviewed resources)
In-class assignments, homework, and class participation
A group final game project (due on Final Exam day as stated in Class Schedule) Mon 13May (3:30, but we use midnight)

The breakout for grades is as follows:

• 25% Research Report (individual) [Assign#2, #3]
• 25% 2D game project with documentation (individual) [Assign#4, #5]
• 40% Final group 3D game project with documentation (as group member) [Assign#7, #8, #9]
• 10% Participation and in-class assignments [Assign#1, #6, attendance]
Your 2D and 3D game projects will be useful for students in subsequent courses to examine for guidance. If you require that your work not be viewed by future students, please advise the instructor.

Turning in Work: Be sure to include your name, the course name and topic on all work to be turned in. Your written documents must have your name in the title section. Your code must have your name in initial comments.

Late Coursework: All assignments are to be turned in on the due date. Late work may be accepted at the instructor's discretion. If accepted, a penalty of 10% per day will be deducted from the student score.

Attribution: All works and illustrations used in your code projects or course paper must be cited; this means crediting the source where you found the information you used to support your work. If you fail to give credit for copyrighted information you present as your own work that constitutes plagiarism, and will be penalized by a zero for the project or paper, as appropriate.

Research Report: The instructor will use **Blackboard's TurnItIn** to verify originality):

Good communication skills, both oral and written, are a widely recognized needed skill in the field of information technology. Many proficient technicians have limited skills in communicating with coworkers and end users. Our goal is to address these issues by having each student provide a written research paper and an oral presentation of their individual game in class.

"Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Blackboard's Safe Assign system for the detection of plagiarism. All submitted papers will be included as source documents in the Safe Assign reference database solely for the purpose of detecting plagiarism of such papers. You may submit your papers in such a way that no identifying information about you is included. Another option is that you may request, in writing, that your papers not be submitted using Safe Assign. However, if you choose this option you will be required to provide documentation to substantiate that the papers are your original work and do not include any plagiarized material."

Guidelines for Papers (Research Report & Project Documentation)

Papers Goals: Success in your career will depend greatly on your written and oral communication skills. We recognize the need for students to develop proficiency in these skills, and requires all students to submit a research paper and provide an oral presentation in each class in this class.

Format:
Length 5 – 7 pages, excluding illustrations and bibliography
Margins 1.5" top, 1" left, right, and bottom
Spacing double-spaced for normal text, single-spaced for long quotes
Font Size 10 - 12 point
Font Styles Times New Roman or Courier
Illustrations welcome if of good quality
Cover Sheet optional but suggested – should include topic, course ID/section, student name, and date
Binders Not needed

Citing Sources:

Works used – This is the source material you used to support your research project.
Works consulted – You probably looked at many sources before you located usable material, and you deserve credit for this research. Your work will be considered for credit for works consulted; list your preliminary sources as consulted works.

Choice of Topic:
You must identify your choice of research topic to the instructor on a Bb assignment with a sample of at least two peer-reviewed journal articles you have found on your topic, once you have convinced yourself that you will have access to appropriate references to support to topic.

Once you receive a confirmation from the instructor that your topic is appropriate, you should begin work.

It is the student's responsible to ensure that the SDSU Library (or its interlibrary loan facility) will make available the resources you need. You must turn in an electronic copy, that will be entered into the SDSU **TurnItIn** system to verify originality.

Suggested Research Report Topics
1. The history and evolution of computer game genres.
2. Similarities and differences between the computer game industry and the motion picture industry.
3. Comprehensive study of total effort expended creating a single modern 3D game—includes estimates of effort expended creating all of the tools, utilities, and host software (ie. Compilers, Editors, Operating System) used by the game development team.
4. Shader Technology. How it works, why it's good, what the future holds.
5. Optimizing Scene Graphs. How to get more bang for your rendering buck.
6. High-bandwidth, low-latency networking schemes for real-time applications.
7. Demographics of computer game players and developers.
8. Security vs. Performance: Effective Anti-Cheat measures in Online Games.
9. Study of Online Game World Player Cultures.
10. Comparison of popular MMORPG populations and game play styles.
11. Artificial Intelligence Techniques suitable for use in computer games.
12. Game Realism: What factors have greatest immersive effect (graphics, input devices, audio, artwork, etc).
13. Mathematical models for vehicle simulations.
14. Establishing mood through sound effects and music.
15. Establishing game "story" using pacing, challenges, and dramatic tension.
16. Social interaction and multi-player games: inside the game; outside the game.
17. The Walter Mitty Factor in computer games.
18. Anonymity and Online Personas: Healthy Escapism or Harmful Posturing?
19. Online game economies.
20. Using Game Engines for industrial, military, and academic applications.
21. Modeling weather and other environmental factors in games: emulation or simulation?
22. Real-time photo-realism in computer games. I want my Holodeck, and I want it now!
23. The future of Independent Game Development. The future of computer games, or a flash-in-the-pan?

24. Elective topic (prior to working on a topic of your own, you must give the instructor your title, a brief description and a sample of the references you will be using. this must be acknowledged by instructor before starting.)

Special Accommodations: If you have a special learning need or issue, it works to your advantage to notify your instructor immediately if special devices or assistance will help you in this class. Students are required to provide documentation of disability to Disability Support Services prior to receiving accommodations.

Classroom Etiquette: Pagers and cell phones will be turned off or set to vibrate mode during class. Please show courtesy to the class by restricting conversation to in-class topics, and raise your hand to gain attention when asking a question or raising a point of discussion.

Academic Honesty: The college experience is founded on the concepts of honesty and integrity. Dishonesty, cheating, plagiarism, or knowingly furnishing false information to the college are regarded as particularly serious offenses. Cases of dishonesty will be handled by levying certain penalties. However, in flagrant cases, the penalty may be dismissal from the college after proper due process proceedings. The verification of originality by Blackboard's **TurnItIn** will be used to verify your individual research paper.

Class Calendar:
Assign#1 – Introduce yourself and upload a picture of yourself – Due 31Jan
Assign#2 – State your research paper topic, with introductory paragraph and at least 2 peer-reviewed reference – Due 15Feb
Assign#3 – Individual Research Report – upload to Bb TurnItIn Assignment by 01March
Assign#4 – Individual 2d Game Proposal – Due 08March
Assign#5 – Individual 2d Game code with user guide and description (Zip-file of your "Clean Build") [based on textbook through Chapter 8] – Due 22March
Assign#6 – Discussion Board Assignment – Group 3d Game – due before Spring Break – 29Mar
Assign#7 – 3d Game Group Plan with Lead and roles for other members specified – due 19 April
Assign#8 – 3d Game Doc – due at time of final exam
Assign#9 – Final Group 3d Game – due at time of final exam