

District name: Abbotsford

District Number: SD #34

Developed by: Bill Henderson

Date Developed: October 2006

School Name: Abbotsford Virtual School

Principal's Name: Don Martyn

Board/Authority Approval Date:

Board/Authority Signature:

Course Name: Intro to 3D Animation for Interactive Entertainment 11

Grade Level of Course: 11

Number of Course Credits: 4

Number of Hours of Instruction: 120

Prerequisite(s): 3D Content Creations for Interactive Entertainment

Special Training, Facilities or Equipment required: This is an online course. Software (free open source) will be provided to the students at no charge.

Course Synopsis:

This course is designed to give the student a solid skill foundation in creating animations that will provide the motion to characters and objects used in interactive entertainment applications. Using an industry standard open source (free) 3D animation package, Blender, students will be given hands-on training utilizing industry methodologies. Learning the basics, students will be working in a 3D computer graphics environment gaining a solid understanding of animation history, planning, principles, and the application of the industry's production pipeline to create game ready animation. The course is designed to first guide the student through theory and exercises which will develop their understanding of the process of creating game animation. Projects increase in complexity and challenge as the course progresses. Upon completion the students will be able to apply their knowledge to plan and create game animations on their own.

Unit 1: Exploration

Students will be introduced to the world of animation. The history of animation will be examined as students study pioneering classical animators and their influence on all animation to date. During this era, 12 animation principles were defined that underlie all forms of animation. The theory of these principles will be observed and studied followed by future application through simple animation exercises. The importance of observation will be introduced as students will notice these principles in everyday life.

The 12 Principles of Animation:

1. Squash and Stretch - defining the rigidity and mass of an object by distorting its shape during an action
2. Timing and Motion - spacing actions to define the weight and size of objects and the personality of characters
3. Anticipation - the preparation for an action
4. Staging - presenting an idea so that it is unmistakably clear
5. Follow Through and Overlapping Action - the termination of an action and establishing its relationship to the next action
6. Straight Ahead Action and Pose-to-Pose Action - The two contrasting approaches to the creation of movement
7. Slow In and Out - the spacing of the in-between frames to achieve subtlety of timing and movement
8. Arcs - the visual path of action for natural movement
9. Exaggeration - Accentuating the essence of an idea via the design and the action
10. Posing - the foundation of giving character's life
11. Secondary Action - the action of an object resulting from another action
12. Appeal - creating a design or action that is enjoyable to the viewer

Curriculum Organizer: Human Resources

It is expected that students will:

- identify the mainstream styles of animation.
- demonstrate understanding of the history of animation.
- identify the role of animation within the development of interactive entertainment.
- develop skills of observation as they analyse motion studies.
- enhance the value of the team they work with.
- identify the 12 principles of animation.
- explain the differences of animating pose to pose vs. straight ahead.
- analyze existing animation to identify techniques used.

Curriculum Organizer: Tools and Technologies

It is expected that students will:

- employ basic tools and techniques to produce traditional animation.
- demonstrate their knowledge of key frame concept development to draw multi sheet (i.e. flip book) animations.
- demonstrate their ability to draw simple perspective drawings.

Curriculum Organizer: Production Process

It is expected that students will:

- apply the mechanics of motion to their animations.
- explain and produce a walk cycle in 3D.
- explain and produce pose to pose animation.

Curriculum Organizer: Artistic and Creative Direction

It is expected that students will:

- use animation to convey the character's emotion.

Unit 3: Production

Throughout animation production, students will be encouraged to view work in progress and finished animation with an analytical eye, offering advice to fellow classmates. Students will utilize the different tools 3D animation software provides while applying the creative process to produce character animation. Students will be able to demonstrate how shortcuts and properly customized settings can increase efficiency and help improve productivity. They will be able to identify with the software's animation tool set and will demonstrate practical use. Developing their own character's animation controls will be explored as well. Time management and file management will be expanded on, while using a communal file depot to help build industry standardized habits. Developing design journals will be introduced as students share their own discoveries throughout their productions with fellow classmates.

Curriculum Organizer: Human Resources

It is expected that students will:

- develop the self confidence to be able to act out their animations.
- consistently share and critique work of team members.
- demonstrate the importance of milestones by consistently meeting them.

Curriculum Organizer: Tools and Technologies

It is expected that students will:

- use 3D software to model simple characters.
- use 3D software to animate characters .
- use features of 3D software (i.e. hierarchical and graph editors) to polish animations.

Curriculum Organizer: Production Process

It is expected that students will:

- demonstrate the workflow of an interactive entertainment animator.
- improve their work by interacting with others at all stages of development.
- produce a simple cut scene animation that demonstrates secondary motion.
- produce an animation controller controlled sequence.
- produce a software engine controlled animation.
- be able to layer animations for engine simulation.

Curriculum Organizer: Artistic and Creative Direction

It is expected that students will:

- observe and record action over time, and reproduce as a 3D animation.
- utilize acting techniques in the production of a 3D animation.
- consistently use staged development of assets to best communicate with a team.
- examine animations to be able to identify strengths and weaknesses.
- demonstrate deliberate exaggeration of the 12 principles of animation.

Unit 5: Sharing and Reflecting

Students will be provided with methods and resources for continuing education. They will be able to identify the requirements for obtaining employment and will be able to locate help. The students will be able to demonstrate the ability to share work with others. They will develop helpful habits of sharing constructive criticism and will demonstrate application of critiques from others on their own work. Documentation of personal discoveries will be shared as students finalize their design documents/journals.

Curriculum Organizer: Human Resources

It is expected that students will:

- demonstrate a planned learning path to follow after course completion.
- locate appropriate resources to develop a 3D animation.
- participate in a related online community to share accomplishments and ideas.
- demonstrate confidence when sharing and reflecting.

Curriculum Organizer: Tools and Technologies

It is expected that students will:

- select the most appropriate vehicle of sharing.
- demonstrate the ability to use online community software (i.e. forums, blogs, online portfolios, etc.).

Curriculum Organizer: Production Process

It is expected that students will:

- document a production journal of 3D animation project from “concept” to “postmortem.”
- develop and maintain a personal portfolio.

Curriculum Organizer: Artistic and Creative Direction

It is expected that students will:

- advance their progress by promoting their ideas and concepts.
- appropriately incorporate revisions into their work.

Learning Resources

- 3D Animation Software (Open Source Software - free to students and school)
- Visit to a game production company
- Articles, information and online communities on the Internet
- Teaching Gamecraft, Daughtry et al, Mesmer, 2003 (free distribution)
- The Animator's Survival Kit, Richard Williams, Imogen Sutton, 2001

Additional Course Information:

This is a new course, building upon the success of programs previously offered at Robert Bateman Secondary School, and building upon the standards established by the US National Skill Standards Board. The course developer is closely connected to the commercial interactive game development community within British Columbia. This course is the second of a series of eight planned courses in this area of study and employment. Students will need adequate computer equipment and internet access to complete this course. This should not be a problem, as the same equipment is required to participate in a distributed learning program.