



Board/Authority Authorized Course Framework Template

School District/Independent School Authority Name: Okanagan Skaha	School District 67
Developed by: Nicolas Kast	Date Developed: Jan 19, 2018
School Name: Summerland Secondary	Principal's Name: Alan Stel
Superintendent Approval Date (for School Districts only):	Superintendent Signature (for School Districts only):
Board/Authority Approval Date:	Board/Authority Chair Signature:
Course Name: 3D Computer Animation 11	Grade Level of Course: 11
Number of Course Credits: 4	Number of Hours of Instruction: 120

Board/Authority Prerequisite(s):

Special Training, Facilities or Equipment Required:

Working computer lab, Maya 64bit software, Adobe Photoshop

Course Synopsis:

Modeling clean, animate-able polygonal meshes is essential in 3D computer animation. This course will provide a full introduction to the 3D animation pipeline. It will focus on proper modeling work flow for modelling polygonal objects and environments. Students will

also learn about texture mapping and UV unwrapping; create a skeleton for different 3D model types and setup a rig for animating; and explore the fundamentals of animation using various key framing techniques.

Goals and Rationale:

Rationale:

This course continues where 3D Computer Animation 10 ended. It will continue to advance the students skill set in 3D Computer Animation. This subject matter has traditionally been only available to students at a post-secondary level. It will continue to cover polygon modeling techniques, material creation, texture mapping and animating tools in greater detail. Students also have the option to explore digital 2D animation. The intent of this course to help students decide if they have the creativity, skills, motivation and desire to pursue a future career in this growing occupation.

Goals:

Upon successful completion of this course, the student will be able to:

- Create, save and edit animations and projects.
- Navigate the interface of a chosen industry standard 3D modeling software application.
- Gather and use reference to assist in modeling environments.
- Model polygonal meshes.
- Use hypershade workspace to apply shaders to 3D models.
- Model an environment with consideration to depth and sight lines.
- Construct a texture map ready for use in a three dimensional program.
- Unwrap UVs for 3D objects.
- Create a basic skeleton and armature for different model.
- Bind the geometry to the skeleton.
- Create rig controls with primitive mesh and curves.
- Connect the controls to the skeleton or other controls.
- Create a fully functional rig for a basic 3D character or prop.

- Create simple posing, pose to pose animation.
- Apply timing and spacing between animation key frames.
- Animate a simple animation walk cycle.

Aboriginal Worldviews and Perspectives:

- The ethics of cultural appropriation and plagiarism
- explore how First Nations used natural resources to produce tools, art, structures and cultural artifacts
- Respect for community elders as the knowledge holders

BIG IDEAS

Personal animation skills require the evaluation and refinement of skills

Tools and technologies can be adapted for specific purposes.

Growth as an **animator** is dependent on perseverance, reflection and resilience

Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to do the following:</i></p> <p><u>Exploring and creating</u></p> <ul style="list-style-type: none"> • Demonstrate to ability to use industry standard software applications • Explore a wide range resource materials ranging from traditional text material to online resources and media platforms • Demonstrate create thinking by using ideas inspired by exploration • Develop skills and techniques used in 3D computer animation • Demonstrate an active and disciplined approach to challenging and complex learning situations • Apply knowledge and skills from past learning experiences <p><u>Ideating</u></p> <ul style="list-style-type: none"> • Take create risks in generating ideas and fulling project requirements • Screen ideas for possible conflicts and limitations • Maintaining an opening mind to allow rough concepts to develop and evolve into a finished product 	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> • 3D animation terminology • Perspective vs. isometric views • Software, file management and organization • Creating/set up of image planes for orthographic cameras • Polygon modeling techniques focusing on extruding faces and inserting edge loops • Creation of uv texture maps • Editing/unfolding of uv texture maps • Creating custom textures using Adobe Photoshop • Creating custom character rigs using ik handles, point and rotational constraints, and control objects • Setting animation key frames and adding secondary animation to models • Modeling for 3D printing: limitations and constraints • Types of 3D printing filaments

Modeling and Animating

- Identify appropriate tools, software, materials, knowledge, and **animation workflow pipeline** to complete assigned challenges
- Develop a project plan for student centered work when working individually or as a group to coordinate responsibilities and resources

Sharing

- Sharing of knowledge and skills while working in a collaborative environment
- Critically evaluating work to look for continual improvements to designs and knowledge

Applied Technologies

- Informed awareness of existing, new and emerging, software and tools that assist in the in the creation process in 3D animation
- Analyze the role and impact of technology on culture and society
- Study the impact of **e-waste** and plastics on the environment

Big Ideas – Elaborations

- **animator** - an artist that produces multiple images and gives them the illusion of movement by displaying them in rapid sequence

Curricular Competencies – Elaborations

- **industry standard** - the generally accepted requirements followed by the members of an industry
- **animation workflow pipeline** - the path by which an animation goes from an idea to a finished product. These steps include: story boarding, concept design, modeling, texturing, rigging, animating, lighting, rendering and editing
- **3D computer animation**- the process of generating animated images with the use of 3D computer graphics and software
- **e-waste** – discarded electrical or electronic devices that are destined for resale, salvage, recycling, or disposal

Content – Elaborations

- **orthographic view** – represents a three dimensional object using several two-dimensional views of the object
- **perspective view** - gives a three-dimensional feeling to an object as it is seen by the eye
- **polygon modeling** - a modeling technique for creating 3D surfaces using many flat sided polygonal faces connected together to create a 3D model
- **UV texture map** - an image that is applied and accurately positioned on 3D model to change/modify the appearance of the model

Content – Elaborations

- **character rig** - a skeletal structure for a 3D model used to control its movement, deformation and bending
- **key frame** - defines the starting and end points of an animation
- **3D printing filament** – a plastic stranded wire used in 3D printing as a consumable material to make physical 3D models and prototypes
- **Ik handle** – a control structure that lets you pose and animate an entire joint chain by moving a single manipulator

Recommended Instructional Components:

- Direct instruction
- Demonstrations
- Tutorial support material
- Peer teaching
- Experimental learning and problem solving

Recommended Assessment Components: Ensure alignment with the [Principles of Quality Assessment](#)

- Performance assessment
- Self-assessment

Learning Resources:

- Lynda.com
- area.autodesk.com/all/tutorials/maya
- academy.autodesk.com/curriculum/animation

Additional Information:

None