



# COURSEWARE

JANUARY 2018

## **3D Character Animation Workshop**

**4 WEEKS**

**Saturdays & Sundays  
3:00 p.m. – 6:00 p.m.**

# COURSE OBJECTIVES:

By the end of the program, the students will have the ability to create quality 3D characters from ground up. They will learn the professional level workflows in the design process. And while focusing on the core skill set, they will gradually be getting acquainted with the Maya software environment. They will learn and implement the complete character development pipeline.

# COURSE DESCRIPTION:

This 3D Character Animation Workshop is designed for students who want to learn the essentials of 3D character design process & animation with high-end 3D computer programs but do not have the time required to devote to full-time study as a year-round student.

This intense 4 weeks workshop covers the entire character creation process. Students will learn the entire workflow:

- Overview of 3D Animation & VFX industry
- Future job prospects in the digital media industry in Pakistan & abroad.
- Intensive HAND-ON training by the professionals in the field.
- Character design & development steps:
  - CHARACTER BASE BODY: design & acquire
  - CHARACTER DRESS SHAPE DESIGNING
  - CHARACTER DRESS MESH DESIGNING
  - CHARACTER SKELETON CREATION
  - CHARACTER ANIMATION
- Overview of complete workflow
- Career counselling



## TOPICS INCLUDED:

**FUNDAMENTALS OF 3D ANIMATION IN AUTODESK MAYA:** tools and techniques for prop modelling in Autodesk Maya, and examine the process of how to create models for a variety of applications. Students will work on full production style “pipeline”, taking the reference from design to proxy, and on to the final model.

**CHARACTER DRESS DESIGN & MODELING IN MARVELOUS DESIGNER:** 3D design tool for clothes and fabrics, used in animated films and video game development for 3D character design, 3D art, 3D Models and 3D Animation.

**3D MODELING GUIDELINES FOR VR & GAMING:** Virtual Reality (VR) is an emerging medium that is changing the way that people experience entertainment, education, and a widening array of applications that extend beyond the entertainment industry. Students will learn the guidelines & requirement’s of creating characters for these emerging technologies.

**DESIGNING AND MODELING A UNIQUE 3D CHARACTER:** learn to create unique 3D characters that come to life with realistic textures! Character creation is one of the most dynamic and exciting parts of designing and modeling 3D games and films. This hands-on Maya experience covers every aspect of the character creation process from concept and design to the finished product. Through modeling, texturing, and prepping your rig for animation, you’ll learn how to do it all using the industry standard for CGI creation

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## LEARNING OUTCOME:

In this 4-Week 3D Character Animation Workshop students learn the fundamentals of 3D animation — basic modeling techniques, character design & development process, and much more — through hands-on experience with the industry-standard Maya software, which has been used in every film to win an Oscar for best visual effects since 1997. Over the course of the four weeks, students quickly develop from learning how to perform basic modeling to start developing their own characters for VR, gaming, film & broadcast.

The 4-Week 3D character animation workshop shares the same focus as our one year “3D ANIMATION & VFX” program: learning by doing. At School of Animation, courses are taught by active professionals in the field, who are able to convey theory as a tool to be used to create great art. The goal is not only to offer students a better understanding of animation, but to empower them to create their own films and pursue a future in the field of animation.

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# LEARNING MATERIAL:

In this 4-Week 3D Character Animation Workshop students learn the fundamentals of 3D animation — basic modeling techniques, character design & development process, and much more — through hands-on experience with the industry-standard Maya software, which has been used in every film to win an Oscar for best visual effects

## Course Texts and References

(not mandatory to purchase)

- Maya Help File (in Maya menu, F1 key)
- The Art of Maya: An Introduction to 3D Computer Graphics by Autodesk Maya Press
- Getting Started in 3D with Maya by Adam Watkins, Focal Press, 2012
- Introducing Autodesk Maya 2016: Autodesk Official Press by Dariush Derakhshani, Sybex, 2015
- Mastering Autodesk Maya 2016: Autodesk Official Press by Todd Palamar, Sybex, 2015
- Digital Art Masters series by 3DTotal publishing
- Character Animation Fundamentals by Steve Roberts, Focal Press, 2012

## Useful Links

- [http://knowledge.autodesk.com/support/maya#?p=MAYAUL&p\\_disp=Maya&sort=score](http://knowledge.autodesk.com/support/maya#?p=MAYAUL&p_disp=Maya&sort=score)
- <http://forums.cgsociety.org/>
- <http://www.creativecrash.com/maya/>
- <http://www.angryanimator.com/word/2010/11/26/tutorial-2-walk-cycle/>
- <http://www.melscripting.com/>
- Digital sculpting: <http://pixologic.com/sculpttris/>
- Tutorial by Yifat Shaik: <https://tplinovator.wordpress.com/> And more online tutorials.

## COURSE STRUCTURE:

The 3D character animation workshop is designed for students to learn both practical and theoretical knowledge. It is a complex interdisciplinary subject of artistic expression and technological understanding, requiring an open creative mindset from students. Throughout the class, there will be several projects to help students build problem solving abilities toward the subject in an incremental way.

Each class consists of a **three-hour lecture and lab session**, to accomplish a combined theoretical and practical approach. The main software used in the class is Autodesk Maya, which has very strong support for modeling and animation as well as other related stages of the production pipeline.

**All students are expected to practice on their own the topics covered in each session, to fully comprehend and master the concepts.**

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# COURSE SCHEDULE:

## WEEK ONE: DAY ONE

Overview of 3D Animation & VFX industry.  
Future job prospects in the digital media industry in Pakistan & abroad.

**Lecture:** Overview of the course: review course outline, intro to projects. Intro to computer animation.

**Lab:** Intro to Maya animation interface and production workflow

### Assignment 1

#### TOPICS COVERED

- Introduction to 3D art
- Introduction to 3D animation
- Introduction to Autodesk Maya
- MAYA Beginners Guide
- Basic workflow in Maya
- 3D modeling overview
- Animation cycle overview

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**AUTODESK MAYA IS THE PREMIERE ANIMATION SOFTWARE:**

 **AUTODESK®  
MAYA® 2018**

Maya® 3D animation, modeling, simulation, and rendering software provides an integrated, powerful toolset. Use it for animation, environments, motion graphics, virtual reality, and character creation.

## WEEK ONE: DAY TWO

**Lecture:** Step one in character creation process is the creation of base model, in our case a human body. Maya has extensive building blocks to create these character bodies from scratch. However, there are many software that create ready-made base models, which we will study and apply.

**Lab:** Basics of polygon modeling in Maya, create a base character body using third party software.

### Assignment 2

#### TOPICS COVERED

- Creating base model from **MakeHuman** software
- Polygon modeling overview in Autodesk Maya

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#### BASE BODY CREATION USING MAKEHUMAN SOFTWARE:



**Makehuman** is an open source 3D computer graphics software middleware designed for the prototyping of photo realistic humanoids. It is developed by a community of programmers, artists, and academics interested in 3D modeling of characters.



## WEEK TWO: DAY ONE

**Lecture:** Overview of modeling techniques; making complicated dress models in professional grade software like Marvelous will be introduced and taught.

**Lab:** creating dress designing for characters – MARVELOUS

### Assignment 3

#### TOPICS COVERED

- Importing base character
- Marvelous user interface
- Creating 2D dress patterns
- Sewing dress parts
- Setting up techniques using simulation
- Saving the final dress as 3D mesh

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#### DRESS CREATION IN MARVELOUS DESIGNER:



Marvelous Designer, 3D design tool for clothes and fabrics, used in animated films and video game development for 3D character design, 3D art, 3D Models and 3D Animation.



**WEEK TWO:**  
**DAY TWO**

**Lecture:** Overview of modeling techniques; making complicated dress models in professional grade software like Marvelous will be introduced and taught.

**Lab:** retopology using Maya software

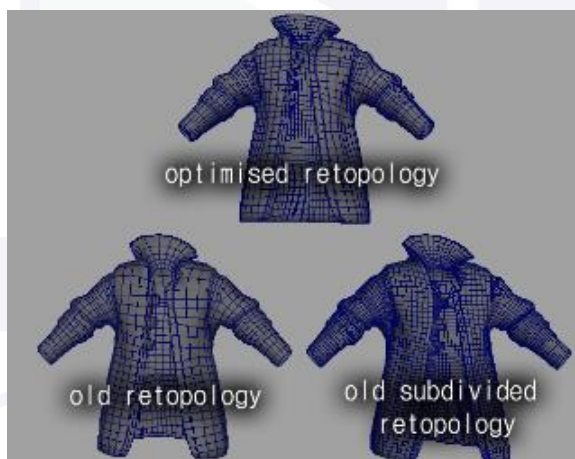
**Assignment 4**

TOPICS COVERED

- Create new topology with Quad Draw
- Refine existing topology with Quad Draw
- Quad Draw Tool hotkeys
- Parent topic: Polygonal Modeling

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**RETOPOLOGIZING IN MAYA:**



There are lots of ways you might use the retopology tools, but the main way they are used today is to free you from thinking about polygons until you have to. It used to be that if you wanted to create a model, you would have to start in something like Maya, LightWave, etc, and build everything up polygon by polygon, until you had a workable mesh. Then you would paint it, so it looked "real" and render it in an animation app

## WEEK THREE: DAY ONE

**Lecture:** Overview of texturing process in Maya. What are UV's how they are used to create textures for the character

**Lab:** UV texturing a 3d character

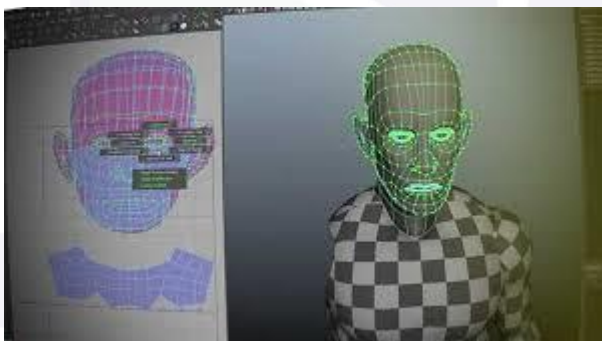
Assignment 5

### TOPICS COVERED

- How to texture a model in Maya
- Planar projections
- Unfolding UV's
- Texturing human character

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### TEXTURE MAPPING USING MAYA:



**Texture** mapping is a method for defining high frequency detail, surface **texture**, or color information on a computer-generated graphic or **3D** model.

## WEEK THREE: DAY TWO

**Lecture:** Overview of 3D **rigging**- the process of creating a skeleton for a 3D model so it can move. Most commonly, **characters** are **rigged** before they are animated because if a **character** model doesn't have a **rig**, they can't be deformed and moved around.

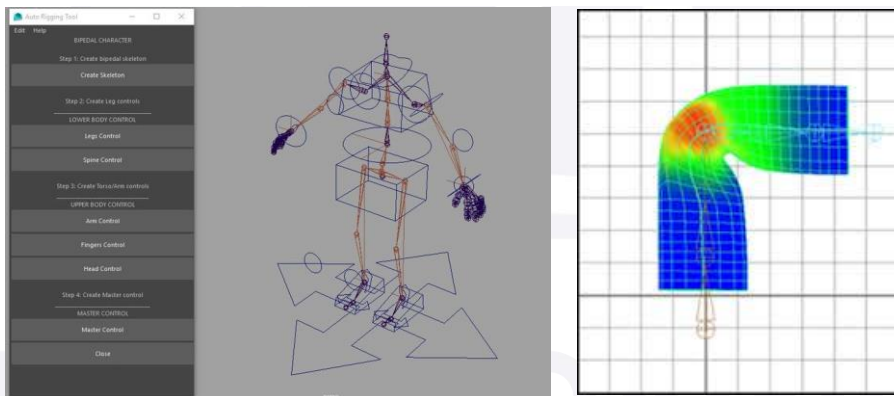
**Lab:** Maya rigging tool

Assignment 6

### TOPICS COVERED

- Understanding the basics of rigging
- Creating skeletons
- Rigging characters
- Using Maya's new HumanIK skeletons/rigs
- Using Quick rig option
- Binding skin using Smooth Bind
- Painting and editing skin weights
- Finalizing a rig

### MAYA CHARACTER RIGGING:



**Rigging** is what makes deforming a character possible. It's the process of taking a static mesh, creating an internal digital skeleton, creating a relationship between the mesh and the skeleton (known as skinning, enveloping or binding) and adding a set of controls that the animator can use to push and pull the character around as if he/she is a puppeteer

Using the Paint Soft Body **Weights Tool**, you can set goal weights on a soft body on a per particle basis by painting on the soft body surface. The tool provides color feedback so you know which parts of the soft body have particles with different goal weights. Weights display as a range of grayscale values, with a weight of 1 displaying as white and 0 as black.

**WEEK FOUR:**  
**DAY ONE**

**Lecture:** Overview of 3D Character Animation – WALK-CYCLE

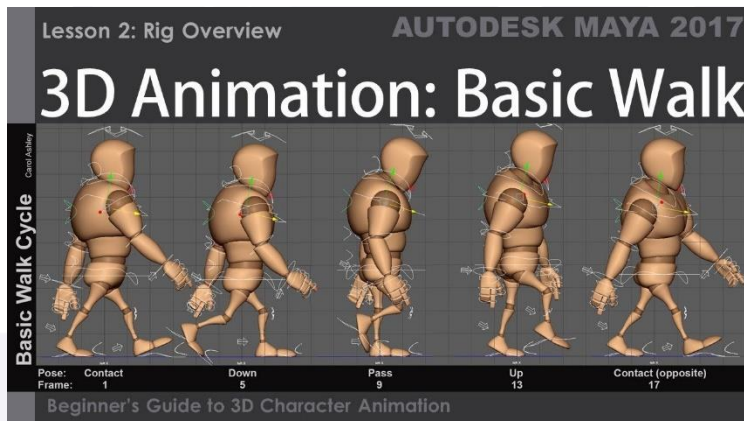
**Lab:** Using Maya animation workflow, retargeting character animation

Assignment 7

TOPICS COVERED

- Introduction to 3D Character Animation
- Animation Workflow using references
- Basic animations
- Character animation basics
- Retargeting

**WALK-CYCLE ANIMATION:**



You can animate your rigged Character Generator model in Maya by setting keys or by applying motion capture to your model.

This task assumes you brought in Maya your customized character created in Character Generator, validated your character's skeleton

definition, and added a Control rig as the input source for your character.

**WEEK FOUR:**  
**DAY TWO**

**Lecture:** Overview of the lighting & rendering in Maya. Career Counseling & EVALUATION & overview of entire process learned in 4 weeks

**Lab:** Lighting & rendering in Autodesk Maya.

Assignment 8

TOPICS COVERED

- Introduction to lighting in Maya
- Introduction to Rendering using Arnold
- Evaluation
- Career Counseling

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**EVALUATION & COUNSELING:**

**Student Course Evaluation Questionnaire**

(To be filled by each Student at the time of Course Completion)

Center \_\_\_\_\_ Course No \_\_\_\_\_  
Course Title \_\_\_\_\_ Teacher Name: \_\_\_\_\_  
Year of Study \_\_\_\_\_

Please give us your views so that Course quality can be improved. You are encouraged to be frank and constructive in your comments.

**Career Counseling**

Animation career counseling will explain you about a career as an animator, what kind of work roles are offered, which are the major animation studios, freelancing options, what is the average starting salary for animators, what are the skill-sets required for high value animation jobs both locally as well as internationally.