

## Course Matrix

### Semester V

Course No.	Course Type	Course Code	Course Title	Course Credit
23	SEC1	23VBX0S501	Research Methodology	4
24	DES8	21VBB16D502	3D Basics - Modeling to Animation*	4
25	DES9	21VBB16D501	Clay Modeling and Animation*	4
26	DSE10	23VBB24E501	3D Digital Art*	4
27			Applied Learning II	4
<b>Total Credit</b>				<b>20</b>

## Syllabus: Semester V

**Course: Research Methodology**

**23VBX0S501**

**Course Credits: 4**

**Course Code:**

**Learning Hours: 120**

### Course Outcomes:

CO1: Understanding of basic Animation principles.

CO2: development of solutions to aesthetic and design problems.

CO3: Abilities in drawing sufficient to support work in sculpture.

CO4: Knowledge and skills in the use of basic tools.

CO5: Identify and apply the 12 principles of animation

### Unit 1: Bouncing Ball - Stretch & Squash, Timing, Weight, Overlapping.

Squash and stretch is what gives flexibility to objects. The easiest way to understand how squash and stretch work is to look at a bouncing ball.

**Learning outcome:** Able to learn characters change shape as they move around.

### Unit 2: Usage of IK, FK and Body Kinematics in Animation.

In kinematic animation the objects are moved according to a set of given equations for the velocities or the accelerations at certain points of the objects.

**Learning outcome:** This procedure results in a realistic animation only if the prescribed velocities and accelerations were derived from a complete dynamic physical model.

### **Unit 3: Concepts of Body Language**

The unspoken part of communication that we use to reveal our true feelings and to give our message more impact.

**Learning outcome:** *the use of physical behavior, expressions, and mannerisms to communicate non-verbally.*

### **Unit 4: Creating Poses based on Body Language**

Body Language include facial expressions, eye gaze, gestures, posture, and body movements.

**Learning outcome:** *Your ability to understand and interpret other people's body language can help you to pick up on unspoken issues or feelings.*

### **Unit 5: Understanding Layout, Camera, Composition.**

Layout builds the first 3D representation of that storyboard, in a full cinematic form, by using the characters, sets and props created by the Modeling department.

**Learning outcome:** *Artists animate the characters roughly at this stage of production, working efficiently through numerous iterations.*

### **Unit 6: Concept of Strong Poses - Negative and Positive Spaces**

Strong poses are one of the fundamental building blocks of animation. Even the simplest shots require that a character hit a strong pose: a pose that is anatomically correct, is pleasing to the eye

**Learning outcome:** Positive and negative space are terms referring to composition in art, graphic design, and photography

### **Unit 7: Working with Key pose, Breakdown, in-between**

Keys: the drawings which define the movement. Breakdowns: the drawings which define the arcs and fine-tune the timing. In-between: everything else.

**Learning outcome:** The key poses would be the two poses at either end of the sequence, with others where key gestures, expressions or steps need extra emphasis. The in-betweens are the frames on either side of the key poses, completing the movements smoothly.

**Course: 3D Basics - Modeling to Animation**  
**21VBB16D502 Course Credits: 4**  
**Learning Hours: 120**

**Course Code:**

**Course Outcomes:**

CO1: Understanding of basic design principles.

CO2: development of solutions to aesthetic and design problems.

CO3: Abilities in drawing sufficient to support work in sculpture.

CO4: Knowledge and skills in the use of basic tools.

CO5: complex process in which the 3D artist uses various software and tools

**Unit 1: Introduction to Maya & Interface & basic primitives**

Primitives are pre-made geometry sets, usually in simple shapes: spheres, cubes, cylinders, planes, cones, and torus.

**Learning outcome:** *Able to use Maya's primitive's tools to make your scenes come alive.*

**Unit 2: NURBS Curves & Surfaces**

NURBS curves and surfaces are generalizations of both B-splines and Bezier curves and surfaces, the primary difference being the weighting of the control points, which makes NURBS curves rational.

**Learning outcome:** *You can use NURBS curves as the path or the shape of a loft. (Lofts created using NURBS curves are loft objects, not NURBS objects.)*

**Unit 3: NURBS - Creating Inorganic object**

Non-uniform rational basis spline (NURBS) is a mathematical model using basis splines (B-splines) that is commonly used in computer graphics for representing curves and surfaces.

**Learning outcome:** *Able to involve creating and manipulating polygons to form the surface of your object.*

**Unit 4: Introduction to Poly Tools-creating basic object**

Vertices, edges, and faces are the basic components of polygons. You select and modify polygons using these basic components. When you model with polygons you usually use three-sided polygons called triangles or four-sided polygons called quadrilaterals (quads).

**Learning outcome:** *Able to approach for modeling objects by representing or approximating their surfaces using polygon meshes.*

**Unit 5: Introduction to Poly Tools-Understanding relative proportions**

A polygon is a closed sequence of three or more edges connected by a surface. Polygons provide the renderable surface of editable poly objects.

**Learning outcome:** *Able to understand, Polygons Sides, vertices, and angles of polygons Quadrilaterals by parallel sides, length of sides, and angles Separation of polygons Combination of polygons.*

### **Unit 6: Introduction to Timeline & key frame animation**

A Timeline can be used to define a free form animation of any Writable Value, e.g. all JavaFX Properties. A Timeline, defined by one or more Key Frames, processes individual Key Frame sequentially, in the order specified by Key Frame Time.

**Learning outcome:** *Able to the controller of the animation as it is used for controlling the speed, ease, effects, and properties of the animation.*

### **Unit 7: Bouncing ball (Working with Dope Sheet and curve editor)**

A bouncy ball or rubber ball is a spherical toy ball, usually fairly small, made of elastic material which allows it to bounce against hard surfaces.

**Learning outcome:** *Able to manipulate key frames by either retiming (sliding them left or right) or copy and pasting.*

### **Unit 8: Secondary Action and overlapping using Pendulum**

A secondary action is any action that results from the primary action. Overlapping action is the result of the main action, and secondary action is independent of the main action.

**Learning outcome:** *Able to emphasize the action and mood of the character. And any*

**Course: ClayModeling and Animation**

**Course Code:21VBB16D501**

**Course Credits: 4**

**Learning Hours: 120**

**Course Outcomes:**

CO1: progress in your drawing ability

CO2: Develop good drawing habits for rendering the human form.

CO3: Abilities in drawing sufficient to support work in sculpture.

CO4: Knowledge of basic Animation.

CO5:Apply design principles and theories to design problems.

**Unit 1: Introduction (Persistence of Vision)**

An optical illusion where the human eye perceives the continued presence of an image after it has disappeared from view.

**Learning outcome:** *Even after the object is removed, the impression of an object seen by the eye remains on the retina for 1/16th of a second.*

**Unit 2: Color concepts**

Color Concepts is the world's largest, independent state-of-the-art profiling and testing lab for the professional digital large-format printing industry.

**Learning outcome:** *Identify primary and secondary colors. Discuss the role of primary and secondary colors in representational and abstract art.Reduce complex colors to simple forms.*

**Unit 3: Painting on earthenware**

Earthenware and stoneware are usually decorated with underglaze colors. After the body is manipulated into the desired shape it is fired. It is then painted, coated with glaze, and fired again.

**Learning outcome:***to feel the colors of real, social beings in nature, how bright, calm, bright, contrasting and unique harmony of color in it.*

**Unit 4: Paper Craft Art**

Paper craft is a collection of crafts using paper or card as the primary artistic medium for the creation of two or three-dimensional objects.

**Learning outcome:***These activities develop preschoolers' fine motor skills and strengthen their ability to concentrate for longer periods.*

**Unit 5: Working with collage**

Pieces of paper, photographs, fabric and other ephemera are arranged and stuck down onto a supporting surface.

**Learning outcome:***enhancing implicit memory through repeated gluing movements and creating unique designs.*

**Unit 6: Miniature set modeling - Creating volume & relative scale**

Miniature set designers design and build miniature props and sets of motion pictures. They build models used for visual effects that meet the look and requirements of the production. Miniature set designers cut material using hand tools to construct three-dimensional props and sets.

**Learning outcome:** *commonly made of metal, plastic, or paper. They are used to augment the visual aspects of a game and track position, facing, and line of sight of characters*

### **Unit 7: Miniature set modeling - Surface texture & lights**

Textured lighting, commonly referred to as gobos, can transform a wall, floor or ceiling with a patterned lighting effect.

**Learning outcome:** *to augment the visual aspects of a game and track position, facing, and line of sight of characters.*

### **Unit 8: Clay modeling -Creating volume & relative scale**

Modelling clay or modelling compound is any of a group of malleable substances used in building and sculpting.

**Learning outcome:** *explore ideas creatively, improve physical dexterity and fine motor coordination, and problem-solving skills.*

### **Unit 9: Clay modeling - Creating surface textures**

Earthenware clay, Stoneware clay, Ball clay, and Porcelain. All of them can be used to make pottery, but the end result would differ a lot thanks to their different textures, colors, and flexibilities.

**Learning outcome:** *Ordinary pieces can become quite extraordinary when you add texture! The most common way to make texture is by impressing various objects into the clay.*

**Course: 3D Digital Art**  
**Code:23VBB24E501**  
**Course Credits: 4**

**Course**

**Learning Hours: 120**

**Course Outcomes:**

CO1: Understanding of basic design of 3D.

CO2: development of solutions to aesthetic and design problems.

CO3: Abilities in drawing sufficient to support work in sculpture.

CO4: Knowledge and skills in the use of 3Dtools.

CO5:development of Movies and Gaming Character Design.

**Unit 1: Inorganic Modeling - BG blocking**

Blocking increases the sample size, which in turn reduces variability; individuals within blocks should be as different as possible to create a more heterogeneous experiment.

**Learning outcome:***3D modelling is the process of creating three-dimensional representations of an object or a surface.*

**Unit 2: Inorganic Modeling - BG detailing of elements**

Inorganic modeling is the modeling of objects that are not organic, such as cars, tv, computers or anything that is made from a material that is manmade and not organic like a person, creature, tree etc.

**Learning outcome:***Inorganic modeling includes all those things that are sharp and have some hard surface in nature.*

**Unit 3: Character Modeling - Blocking whole body**

Blocking is an animation technique in which key poses are created to establish timing and placement of characters and props in a given scene or shot.

**Learning outcome:***able to create a 3d character body low poly level.*

**Unit 4: Character modeling - Body detailing**

Character modeling is the process of transforming a concept, essentially an idea, into a three-dimensional model.

**Learning outcome:***able to create a realistic stylize and body Anatomy modeling*

**Unit 5: Character Modeling - Face detailing**

Create a Seamless Character.

**Learning outcome:***able to create a realistic face, stylize character face and facial Expressions*

### **Unit 6: Character Modeling - Clothing and Props detailing**

Create and apply your own fabric patterns with meticulous **detail**, by simply adjusting parameters to create your own fabulous designs.

**Learning outcome:** *able to create a 3d cloths and 3d props like beg and cap.*

### **Unit 7: Character Modeling - facial Expressions (eye blink, angry, sad, smile)**

Rely on one-dimensional pictures or video sequences which describe the human face in different emotional states.

**Learning outcome:** able to convey countless emotions without saying a word.



**Course: Applied Learning II - Sculpting**  
**Course Credits: 4**  
**120**

**Course Code:**  
**Learning Hours:**

**Course Outcomes:**

CO1: Understanding of basic design principles.

CO2: development of solutions to aesthetic and design problems.

CO3: Abilities in drawing sufficient to support work in sculpture.

CO4: Knowledge and skills in the use of basic tools.

CO5: Easy and regular access to appropriate materials and equipment.

**Unit 1: Introduction & Interface/Application Integration.**

We will go over the basics of working in *Mudbox*, including sculpting geometry, painting textures, posing models, and exporting meshes.

**Learning outcome:** *Will get more comfortable with the Mudbox interface.*

**Unit 2: Mudbox - Sculpting Techniques.**

We will learn various *sculpting tips* and tricks

**Learning outcome:** *Fundamentals of the art of sculpture.*

**Unit 3: Mudbox - Texturing in Mudbox.**

*Mudbox* provides an advantage to painting the textures on the 3D objects directly.

Apart from the high-end digital sculpting features

**Learning outcome:** *Work step by step through texturing.*

**Unit 4: Mudbox - Texturing a character (Clothing & Accessories)**

Paint the skin of a *character* separately from its *clothing* or *accessories*

**Learning outcome:** *Paint the model's Clothing & Accessories color separate.*