

**B.Sc. Animation III (Entire)**

# **Shivaji University, Kolhapur**

**With Effect from June 2015-16**

**Structure, Nature of Question Paper, Course Curriculum**

## **B.Sc III Animation Syllabus**

**From June 2015-16**

Animation is a lead Course in today's world. It has very good prospects and it gives a broad platform to student creativity. The course has wide scope. By considering the need of different industries and present scenario in animation industry the syllabus is designed. While designing the syllabus intellectual level of UG students has been considered. The student who doesn't know the ABC of animation will be able to understand and work independently in the industrial world after completion of his graduate degree. Animation is not only creation of cartoons but also it plays an important role in Automobile industry, Mechanical industry, Web development, different coding, Graphics designing, Film industry and etc.

While designing the syllabus, industrial training and latest softwares like Adobe Photoshop, Corel draw, Adobe Flash, Dream viewer, Autodesk 3D Max, Autodesk 3D Maya, Adobe After Effects, Mudbox are considered.

Students and teachers have to go through this syllabus by taking a keen interest and learn much and more.

## B.Sc. Part III

### Semester-V

#### Theory

Paper Code	Title of the Paper	Period/Week	Examination Marks		
			Internal	Theory	Total
AME 501	3D Modeling-II (3D MAYA)	03	10	40	50
AME 502	3D Texturing-II	03	10	40	50
AME 503	3D Lighting-II	03	10	40	50
AME 504	3D Regging-II	03	10	40	50
AME 505	English-III	03	10	40	50

### Semester-VI

#### Theory

Paper Code	Title of the Paper	Period/Week	Examination Marks		
			Internal	Theory	Total
AME 601	3D Animation-II	03	10	40	50
AME 602	3D Rendering-II	03	10	40	50
AME 603	V.F.X.	03	10	40	50
AME 604	Introduction to Advertisement and Market Research	03	10	40	50
AME 605	English-IV	03	10	40	50

**Semester-V****SYLLABUS**Title of the Paper: **3D Modeling-II (3D MAYA)**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit 1</b> Working in Maya-Creating and Editing Maya Nodes, Creating Maya Projects, Organizing Complex Node Structures with Assets, File References.	10
<b>Unit 2</b> NURBS Modeling in Maya-Understanding NURBS, Employing Image Planes, Modeling NURBS Surfaces, Creating Realism, NURBS Tessellation	10
<b>Unit 3</b> Polygon Modeling Understanding Polygon Geometry, Working with Smooth Polygons, Using Smooth Mesh Polygons, Editing Polygon Components, Adding Components, Modeling with Deformers, Combining Meshes, Polygon Modeling with Paint Effects	10
<b>Unit 4</b> Convert NURBS Surfaces to Polygons, Boolean Operations, Sculpting Polygons Using Artisan, Advanced Polygon Editing Tools, Using Subdivision Surfaces, SubD Levels	10

**Reference Books:- Mastering Autodesk Maya 2011 by Eric Keller**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit 1</b> - UV Texture Layout, What Are UV Texture Coordinates? Mapping the Giraffe Leg Unfolding UVs Mapping the Giraffe Head Mirroring UVs More UV Tools	10
<b>Unit 2</b> -Arranging UV Shells Additional UV Mapping Considerations Transferring UVs Multiple UV Sets Optimizing Textures Bump and Normal Mapping	10
<b>Unit 3</b> - Bump Maps Normal Maps Creating Normal Maps Applying Normal Maps Displacement Mapping Converting Displacement to Polygons	10
<b>Unit-3</b> Displacement Maps for Characters Combined Displacement and Bump Maps Subsurface Scattering Fast, Simple Skin Shader Setup Subsurface Scattering Layers	10

Title of the Paper: **3D Lighting-II**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit-1</b>	
Shadow-Casting Lights	10
Shadow Preview	
Depth Map Shadows	
mental ray Shadow Map Overrides	
Ray Trace Shadows	
<b>Unit-2</b>	10
Indirect Lighting: Global Illumination	
Global Illumination	
Tuning Global Illumination	
Working with Photon Maps	
Color Bleeding	
<b>Unit-3</b>	10
Importons	
Caustics	
Caustic Light Setup	
Indirect Illumination: Final Gathering	
Light-Emitting Objects	
<b>Unit-4</b>	10
Final Gathering Maps	
Using Lights with Final Gathering	
Image-Based Lighting	
Enabling IBL	
IBL and Final Gathering	

**Reference Books:- Reference Books:- Mastering Autodesk Maya 2011 by Eric Keller**

Title of the Paper: **3D Regging-II**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit-1</b>	
Understanding Rigging	10
Creating and Organizing Joint Hierarchies	
Orienting Joints	
Naming Joints	
Mirroring Joints	
Rigging the Giraffe	
IK Legs	
<b>Unit-2</b>	10
FK Blending	
Rotate Plane Solvers	
Creating Custom Attributes	
Spline IK	
Full Body Inverse Kinematics	
Skinning Geometry	
<b>Unit-3</b>	10
Interactive/Smooth Binding	
Weighting the Giraffe	
Painting Skin Weights	
Editing Skin Weights in the Component Editor	
Copying Skin Weights	
Mirroring Skin Weights	
<b>Unit-4</b>	10
The Maya Muscle System Understanding the Maya Muscle System	
Using Capsules	
Creating a Muscle Using Muscle Builder	
Editing Muscle Parameters	
Converting the Smooth Skin to a Muscle System	
Sliding Weights	

**Reference Books:- Reference Books:- Mastering Autodesk Maya 2011 by Eric Keller**

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**Semester-VI****SYLLABUS**Title of the Paper: **3D Animation-II**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit 1</b>	
Using Joints and Constraints	10
Inverse Kinematics	
Keyframe Animation	
The Graph Editor	
<b>Unit 2</b>	
Playblast and FCheck	10
Driven Keys	
Animation Using Expressions	
Motion Path Animation	
Animating Constraints	
<b>Unit 3</b>	
Animation Layers	10
Creating an Animation Layer	
Animating Facial Expressions Using Blend Shapes	
Animating Blend Shapes Sequentially	
Animating with Lattices	
<b>Unit 4</b>	
Animating Object Components with Clusters	10
Animating a Scene Using Nonlinear Deformers	
Creating a Jiggle Effect	
Optimizing Animations with the Geometry Cache	

**Reference Books:- Reference Books:- Mastering Autodesk Maya 2011 by Eric Keller**



Title of the Paper: **3D Rendering-II**

<b>Topics</b>	<b>Lectures</b>
<p><b>Unit 1</b></p> <p>Using the Paint Effects Canvas</p> <p>Painting on 3D Objects</p> <p>Understanding Strokes</p> <p>Designing Brushes</p> <p><b>Unit 2</b></p> <p>Rendering Paint Effects</p> <p>Using Toon Shading</p> <p>Render Layers</p> <p>Render Passes</p> <p><b>Unit-3</b></p> <p>Render Pass Contribution Maps</p> <p>Setting Up a Render with mental ray</p> <p>mental ray Quality Settings</p> <p>Using Fluid Containers</p> <p><b>Unit-4</b></p> <p>Creating a Reaction</p> <p>Rendering Fluid Containers</p> <p>Create Fluids and nParticle Interactions</p>	<p><b>40</b></p> <p>10</p> <p>10</p> <p>10</p> <p>10</p>

**Reference Books:- Reference Books:- Mastering Autodesk Maya 2011 by Eric Keller**

Title of the Paper: **V.F.X.**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<p><b><u>Unit-1</u></b></p> <p><b>Introduction</b> – Operating System, Installing Software, Keyboard shortcuts &amp; Modifiers, Re-setting the Preference</p> <p><b>Interface</b> – Understanding the Interface, Importing Files, Customizing the workspace</p> <p><b>Basic</b> – Basic Animation</p> <p><b>Import</b> – Importing Photoshop compositions, Importing illustrator compositions, Importing image sequences, Importing from editing application, Adobe Bridge</p>	10
<p><b><u>Unit-2</u></b></p> <p><b>Animation</b> – Animation Rules – Part 1, Animation Rules – Part 2, Animation Rules – Part 3,</p> <p><b>Compositing</b> – Channels, Nesting, Pen Tool, Adjusting Mask Properties, Blending Modes, Basic Keying</p> <p><b>Grouping</b> – Pre-composing, Parental Hierarchy, Working with null objects</p>	10
<p><b><u>Unit-3</u></b></p> <p><b>Effects</b> – Color Effects, Time Effects, Animation Preset</p> <p><b>Text</b> - Fonts , Basic Texts, Text animators, Applying effects to text, Text Presets</p> <p><b>3D</b> – 3D in after effects, 3D workspace, Camera Basic, Lighting Basic, Casting Shadows</p>	10
<p><b><u>Unit-4</u></b></p> <p><b>Paint</b> – Paint Basic, Animating Paint, Matte Painting, Advanced Cloning</p> <p><b>Expressions</b> – Disabling Expressions, Linking Properties, Basic Arithmetic</p> <p><b>Output</b> – Rendering movie, Rendering multiple items, Exporting alpha channels, The exporting menu</p>	10

**Reference Books:- \* Creative after effects 7 - Angie Taylor**

Title of the Paper: **Introduction to Advertisement and Market Research**

<b>Topics</b>	<b>Lectures</b>
	<b>40</b>
<b>Unit-1</b> The Basics of Market Research Research Objectives Research Design	10
<b>Unit-2</b> An Introduction to Research Methodologies Introduction to Qualitative Research Introduction to Quantitative Research	10
<b>Unit-3</b> Introduction to Sampling An Introduction to Questionnaire Design Turning Data into Findings	10
<b>Unit-4</b> Reporting and Communicating Findings Professional Development and the Market Research Industry	10

**Reference Books:- A Practical Guide to Market Research by Paul Hague**

## Practical Course

Course No.	Title	Period / Week	Examination Marks		
			Internal	Final	Total
AME111	Animation Lab - I (practical based on 501 +504)	04	----	50	50
AME112	Animation Lab - II (practical based on 502 +503)	04	----	50	50
AME113	Animation Lab - III (practical based on 601 +602+603)	04	----	50	50
AME114	Animation Lab - IV ( Project and Industrial Training)	04	----	50	50

# LABORATORY COURSE

**Laboratory course**    Animation Lab- I    - 3D Modeling II + 3D Rigging II  
(AME 501 + AME 504)

## **Group I – AME 501**

1. Working with Polygon Modeling
2. Polygon :- Selection, Creation, combining, separating, Splitting and Editing
3. Working with Nurbs Modeling
4. Nurbs :- Creating curves, Creating Surfaces, Editing , Trimming, Stitching and Sculpting surface meshes
5. Subdivision Surface Modeling in Maya
6. Subdivision :-surface conversion, Editing surface, Editing Uvs
7. Create Various Basic 3D geometrical shapes
8. Create Basic Polygon inorganic objects (lamp, Mobile, computer, Bike, Car)
9. Create basic architectural polygon modeling
10. Create Interior with polygon and Subdivision
11. Create male and female body with polygon modeling with details
12. Create Cartoon and semi cartoon characters with poly
13. Surface Character Modeling (Mouse Embryo)
14. Create male and female body with subdivision modeling with details
15. Create environment modeling (tree, Mountain, road, Planet, forest)

## **Group II – AME 504**

1. Character setup overview
2. Building and posing skeleton
3. Creating Basic Bone System
4. Full body IK and FK
5. Setup joint chain
6. Pose with invers and forward kinematics
7. Skinning
8. Constraint
9. Deformers
10. Weight
11. Rigging Male body
12. Rigging female body
13. Rigging Animal body
14. Rigging Cartoon Character body
15. Rigging Bike and Car

**Laboratory course    Animation Lab- II    - 3D Texturing II + 3D Lighting II**  
**(AME 502 + AME 503)**

**Group I – AME 502**

1. UV Mapping Overview
2. Mapping UV,
3. Editing UV
4. UV sets
5. Create UV Texture Layout with simple object
6. painting 3D model textures in digital paint (Photoshop)
7. Applying bump maps
8. Applying Normal Maps
9. Applying Texture for inorganic polygon models- I  
(Lamps, Mobile, Planet, Land with grass texture, rock, atmospheric objects system)
10. Applying Texture for organic polygon models – I (Cartoon, Semi cartoon)
11. Applying Texture for inorganic polygon models - II (Solar system, Car, Bike, Plane, )
12. Applying Texture for organic polygon models - II (Human , Animal)
13. Applying Texture for organic Subdivision models – I (Cartoon, Semi cartoon)
14. Applying Texture for inorganic Subdivision models - II (Solar system, Car, Bike, Plane, )
15. Applying texture for rendering final output with organic and inorganic objects

**Group II- AME 503**

1. Basics of lighting
2. Create lighting
3. Absorption, reflection and refraction of light
4. Apply and adjust basic direct lighting
5. Position features of a light interactively
6. Mental ray Light Source
7. Final gather and HDRI
8. Shadow in mental ray
9. Basic mental ray Shades
10. Light nodes. Glow nodes
11. Lighting nodes Photon and final gather nodes
12. Working with camera and shadow-casting lights
13. Setting Camera Parameters
14. Render using the Physical Sun and Sky network lights
15. Render contours with Viewing a Scene from a Light



### **Group III- AME 603**

1. Importing various files
2. Importing sound and video files
3. Compositing sound with effect
4. Compositing video with effect
5. Animate still photos
6. Creating Fire Logo Effect
7. Creating Smoke text effect in after effect
8. Creating energy blast effect in after effect
9. Creating morphing shape in after effect
10. Creating 3D effect in after effect
11. Creating Elegant Light Streaks
12. Creating Lighting effect
13. Creating Advanced Light Rays Effect
14. Creating Particle dance
15. Creating Fire effect

**NOTE: - Minimum 10 practicals from each group should be conducted for AME 601, AME 602, and AME 603**

### **PRACTICALS GROUPING**

Animation Lab I: 3D Modeling II + 3D Rigging II

Animation Lab II: 3D Texturing II + 3D Lighting II

Animation Lab III: 3D Animation II + 3D Rendering II + V.F.X.

Animation Lab IV: Project work and Industrial Training

### **EXAMINATION PATTERN**

Theory Exam: Semester Pattern

Common Nature of Question paper as per Faculty of Science.

Practical Exam: Annual Pattern (Applicable for all Laboratory Courses)

### **Nature of Practical question paper for Lab – I, Lab- II, Lab -III**

1. 4 questions will be asked
2. Out of four questions , student have to solve any two
3. Each question carries 20 marks
4. 5 marks for certified journal of each course
5. 5 mark for oral.

<b>Q .01</b>	<b>20</b>
<b>Q.02</b>	<b>20</b>
<b>Oral</b>	<b>05</b>
<b>Journal</b>	<b>05</b>
<b>Total</b>	<b>50</b>



## **Lab Course –IV**

### **Project Information**

10- Marks for industrial training in vacation, 10 days after completion of Semester V

05- Marks for industrial visit / Excursion (Educational Tour) in Semester VI

35- Marks for project

### **Project Marks Distribution (35) marks**

Project Viva - 05

Project Design - 25

Project Report – 05

**Note: - Project should be based on modeling, Texturing, Lighting, Rigging, Animation, Rendering and VFX**

## **Nature of Question papers (Theory)**

**COMMON NATURE OF QUESTION FOR THEORY PAPER MENTIONED SPERATELY:**