PUNJAB TECHNICAL UNIVERSITY, JALANDHAR

COURSE CURRICULUM

FOR

BACHELORS IN ANIMATION & MULTIMEDIA TECHNOLOGY

(BAMT)

THIRD SEMESTER

Sr.No	Subject	Subject Code	L	T	P	Marks		Maximum Marks	credits
						Int.	Ext.		
1	Web Designing Technologies	AMT-301	3	0	0	40	60	100	3
2	Animation - Modeling Lab	AMT-302	1	0	6	60	40	100	4
3	Fundamentals of Pre-Production	AMT-303	3	0	0	40	60	100	3
4	Digital Film Making Lab	AMT-304	1	0	6	60	40	100	4
5	Print & Advertising Graphic Design Lab	AMT-305	1	0	4	60	40	100	3
6	Character Animation - 1 Lab	AMT-306	1	0	4	60	40	100	3
	TOTAL		10	0	20	320	280	600	

SEMESTER - III

Internal: 40 Marks
External: 60 Marks

AMT- 301 Web Designing Technologies **L-3 T-0 P-0**

OBJECTIVE - The main objective of the subject is to impart the basic understanding of the methods and techniques of developing a web site.

1) **Introduction to the Internet (5%)**

   Modes of connecting to internet, search optimization on internet, applications of internet, introduction to World Wide Web (WWW).

2) **Introduction to HTML (5%)**

   HTML tags, HTML Editor.

3) **Tags, Attributes, Lists and Tables (15%)**

   Structure Tags (HTML,HEAD,TITLE,BODY),Paired and unpaired tags, Ordered list, unordered list, formatting list, tables in HTML, formatting table, cell spacing, cell padding

4) **Links and Images (15%)**

   Making hyper links- anchor tag, images as link, Adding Images, Aligning the image Using Images as a link, Using Background images.

5) **Cascading Style Sheets (5%)**

   Style sheet design, using internal and external style sheets

6) **Creating a Basic Web Page (20%)**

   Creating web pages using basic HTML Tags.

7) **Typography (10%)**
   Composition, Font selection

8) **Text rollovers (10%)**

   Text rollover techniques and applications

9) **Web related functions of Photoshop (15%)**
   Tools, Functions, Shortcut keys, Layers Images. Placing, Resizing, Resolution, Optimizing, Color(RGB), Web Safe Colours. Slicing the page, Saving & naming

Text Book:

- Mastering HTML 4 - Deborah ray ,Pub.- Sybex Inc.

References:

- Web Design for dummies - Lisa Lopuck, Pub.- For Dummies.

SEMESTER - III

Internal: 60 Marks
External: 40 Marks

AMT- 302 **Animation - Modeling Lab** **L-1 T-0 P- 6**

OBJECTIVE - The main objective of the subject is to impart the practical knowledge about 3D Modeling using Maya.

1) Introduction to Nurbs Modeling (10%)

   a. Nurbs Modeling overview & its use.
   b. Nurbs components.

2) Nurbs Curves(10%)

   a. Types of Curves.
   b. Curve creation.
   c. Curve Editing.
   d. Applications of Curves .

3) Nurbs Surfaces(30%)

   a. Nurbs primitives.
   b. Surface creation.
   c. Revolve, Extrude, Loft, Boundary, Birail.
   d. Applications of Surfaces.

4) Introduction to Polygon Modeling(10%)

   a. Polygon Modeling overview & Usefulness
   b. Polygon primitives & components, topology, edge flow

5) Polygon Tools(40%)

   a. Mesh tools.
   b. Edit Mesh tools.
   c. Tools Applications .

Practicals /Submissions

- Props
  - Inorganic objects
  - Character accessories

- Vehicle Model
  - Car Modeling
  - Bike Modeling
  - War Vehicle

- Character Model
  - Cartoon Character Body Modeling
  - Cartoon Character Face Modeling
  - Hyper Realistic Body
  - Quadruped Modeling

References:

1) Mastering Maya 2009 by Eric Allen, and Anthony Honn ,Pub.-SYBEX
2) Edge loop Character Modeling For 3D Professionals Only by Kelly Murdock, Pub.- Wiley

SEMESTER - III

Internal: 60 Marks
External: 40 Marks

AMT- 303 **Fundamentals of Pre-Production** **L-3 T-0 P- 0**

OBJECTIVE - The main objective of the subject is to impart the knowledge of animation pre-production pipeline & workflow.

1) Introduction to Pre-production (5%):

- The basics of Pre Production.
- Importance of pre Production in creating a Project.

2) Concept, Story writing (20%)

- Developing a Concept for Animation.
- Essentials Elements of a story: Start, Middle and Ending of a story

3) Screenplay (10%)

- Definition and Elements of Screenplay.
- Creating a Screenplay.

4) Character development (20%)

- Physical Attributes.
- Visual appearance.
- Nature.
- Characteristics.
- Model Sheet.

5) Props & Environment development (10%)

- Props & Environment illustration.
- Blueprint.

6) Storyboarding (20%)

- Process of creating storyboard.

- Importance of storyboard in Film making.

7) Visual references (10%)

- Types of visual references.

8) Dubbing, Songs (5%)

- Process of Dubbing of Dialogues , Voiceovers, songs etc.

Practicals/Submissions:

1. Concept for a Short Animation Movie.
2. Screenplay for a Short Animation Movie.
3. Story Board using Storyboarding Software.
4. Small Project (minimum 5 minutes) of Dubbing/Song/Dialogue Recording.

Text Book:

- How to write for animation - Jeffrey Scott, Pub.- Overlook TP

References:

- Animation writing & development - Jean Wright, Pub.-Focal Press.
- Animator's Survival kit - Richard Williams,Pub.-Faber and Faber.
- The Illusion of life - Frank Thomas,Pub.- Disney Editions.

SEMESTER - III

Internal: 60 Marks
External: 40 Marks

AMT-304 Digital Film Making Lab **L-1 T-0 P-6**

OBJECTIVE - The main objective of the subject is to impart practical knowledge about non-linear editing and how it can be used for film & television editing & post-production.

1) **Digital Camera Functioning (5%):**

Types of Digital Cameras, Working of a Digital Camera.

2) **Shooting a Clip/Footage (10%):**

Outdoor, Indoor, Landscapes, live action.

3) **Softwares used in Editing (10%) :**

Fundamentals of non-linear & digital Audio/Video editing

4) **Role of an Editor in Film making (15%)**:

Do's and don'ts of Editing, working on an Editing Table, Project setting, Clips management, Timeline Settings & Controls, Tools.

5) **Audio Track Editing (20%)**:

Audio Editing [Normalization, Mixing, Cross-fading, Dynamics, Filters, Mono/stereo formats, Noise gate.

6). Editing the Footage (40%):

Importing clips, trimming clips, splitting clips, manipulating audio content, adding transitions, changing speed of a clip, changing opacity, applying special effects, superimposing an image, exporting a movie .

Practicals/Submissions

- Small Footage (Short Film) (5-10minutes)
- Minimum 30 Sec well edited Television Commercial
- Clips with A/V Sync & transitions.

References books:-

1) Editing Digital Video : The Complete Creative and Technical Guide by Robert Goodman (McGraw-Hill), Pub.- McGraw-Hill/TAB Electronics.
2) Adobe premiere pro Bible by Adele Droblas, Pub.-Wiley.

SEMESTER - III

Internal: 60 Marks
External: 40 Marks

AMT-305 Print & Advertising Graphic Design Lab **L-1 T-0 P- 4**

OBJECTIVE - The main objective of the subject is to impart the practical knowledge about Print & Advertising Graphic design & its applications.

1) The creative brief Fundamentals (10%):

Understanding Design Principles: Concept Formation, Format, Design, Layout, Graphics.

2) Designing of Office Stationery (20%):

Visiting Cards, Letter Heads, calendars.

3) Print Media (30%) :

Types: Trademark/Logo, Newspaper/Magazine Advertising, Direct Mail Advertising, Poster/Display Advertising, , Billboard Advertising, Kiosks.

Newspaper/Magazine Advertising: Full Page Ads, Double Split Ads,Teaser Ads,

Product /Brand launching Ads.

4) Poster Designing (20%):

Essentials/Qualities of Poster Designing, Poster as a strong medium of Advertising, study of Classic Posters, Innovative Designs for Animation Films, Slogans .

5) Brochure / Pamphlet/Leaflet Designing (20%):

Designing Brochures for an Advertising Agency, Educational Institutions, Animation Company.

Practicals/Submissions (Softwares to be used Photoshop , Adobe Illustrator, Corel Draw)

a. **Office Stationery:** Visiting Card, Letter Head, Calendar for an Animation Studio/Office.
b. **Magazine Advertisement :** Full Page Ad, Teaser Ad for an Animation Movie.
c. **Poster Design :** Poster for an Animation Movie.
d. **Brochure :** 3- Panel Brochure for Animation Institution/Studio.

Reference books:

- Advertising by Design: Creating Visual Communications with Graphic Impact by Robin Landa, Publisher- Wiley .
- Creative Advertising by Mario Pricken, Publisher-Thames and Hudson.

SEMESTER - III

Internal: 60 Marks
External: 40 Marks

AMT- 306 **Character Animation 1 Lab** **L-1 T-0 P- 4**

OBJECTIVE - The main objective of the subject is to impart the practical knowledge about animation in Maya.

1) Introduction to Animation in Maya (5%)

- Maya's usefulness for animation and its advantages
- Animation related interface of Maya and animation preferences

2) Tools used for Animation in Maya (10%)

- Keyframming, playback and playblast.
- Introduction to Tangents.
- Graph editor, Dope sheet.

3) Planning Animation & Different methods of blocking (10%)

- Straight-ahead approach.
- Pose-to-pose approach.
- Staging.

4) Timing, Spacing, Overlapping, Slow in, Slow out, Inbetweening (10%)

- How to adjust, increase and decrease timing & spacing.
- Understanding & application of overlapping.
- Tangent editing.

5) Weight & Balance (10%)

- Importance of weight & balance in animation.
- Applications of weight & balance.

6) Applying principles of animation (15%)

- Applying animation principles to object like bouncing ball.

7) Character Jump Animation (20%)

- Pre-production
- Execution

8) Character walk cycle animation (20%)

- Pre-production
- Execution

Practicals/Assignments:

1) Bouncing Ball (With Stretch and Squash and proper timing).

2) Character Jump Animation.

3) Character walk cycle animation (Simple and Attitude walk).

Reference:-

1) Animator's Survival kit - Richard Williams, Pub.-Focal Press.

2) Timing for Animation - Harold Whitaker,Pub.-Focal Press.

3) Cartoon Animation - Preston Blair,Pub.-Walter Foster.

4) Animation : The Mechanics of Motion - Chris Webster, Pub.-Focal Press

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FOURTH SEMESTER

Sr.No	Subject	Subject Code	L	T	P	Marks		Maximum Marks	Credits
						Int.	Ext.		
1	Essentials of Execution & PostProduction	AMT-401	3	0	0	40	60	100	3
2	Virtual Set Designing Lab	AMT-402	1	0	6	60	40	100	4
3	Camera & Lighting Techniques Lab	AMT-403	1	0	6	60	40	100	4
4	Texturing & Shading Lab	AMT-404	1	0	4	60	40	100	3
5	History of Motion Picture Industry	AMT-405	3	0	0	40	60	100	3
6	Animation - Rigging Lab	AMT-406	1	0	4	60	40	100	3
	TOTAL		10	0	20	320	280	600	

SEMESTER - IV

Internal: 40 Marks

External: 60 Marks

AMT- 401 Essentials of Execution & Post-Production **L-3 T-0 P-0**

OBJECTIVE - The main objective of the subject is to impart the knowledge about Animation execution, workflow & post-production

1) Modeling (10%)

- Types of 3D Modeling, Advantages & Disadvantages of Nurbs modeling & Polygon Modeling.

2) Texturing (10%)

- UV texturing: Texturing of Characters and Props.
- Shading: Different Maya Shaders.

3) Lighting (10%)

- Sources of light: Natural and artificial Lights.
- Types of lights in Maya.
- Types of Shadows in Maya. **4)**

Rigging (10%)

- Joints.
- Inverse Kinematics, Forward Kinematics.
- Types of Skinning.

5) Animation (10%)

- Types of Animation. **6)**

Rendering (5%)

- Process.
- Types of Renderer. **7)**

Data Management (5%)

- How to manage 3D Assets

8) Compositing (10%)

- Process
- Tools used

9) Visual Effects (10%)

- Process

- Tools used

10) Music & Dubbing (5%)

- Process
- Tools used

11) Editing (10%)

- Process
- Tools used

12) Output (5%)

- Types of Output format.

Textbooks:

- Editing Digital Video: The Complete Creative and Technical Guide by Robert Goodman (McGraw-Hill)
- Maya Documentation

References:

- Digital compositing for film & video by Steve Wright
- Professional digital compositing: Essential Tools and Techniques by Lee Lanier, Pub. - Sybex.

SEMESTER - IV

Internal: 60 Marks
External: 40 Marks

AMT-402 Virtual Set Designing lab **L-1 T-0 P-6**

OBJECTIVE - This course aims to equip students with fundamental knowledge in the creation of Photo Realistic 3D assets. The module also focuses on texture acquisition/creation, digital lighting, Rendering Techniques such as Ray tracing, Global Illumination and Caustics. Students will be required to apply what they have learnt to their 3D scenes.

1) Introduction to 3DS Max & Interface (20%):

Modeling, texturing, advanced lighting, animation.

2) Basics of AutoCAD (20%):

- Making basic Geometric shapes
- Complete Basic CAD drawings, with borders, text and dimensions.
- Use Paper Space, and Model space
- Edit drawings with ERASE, OOPS, COPY, EXTEND, TRIM, MIRROR, UNDO REDO and MOVE commands

3) Introduction to Adobe After Effects (10%):

- Introduction to the After Effects interface
- Effects
- Parenting
- Masking
- 3D
- Lights and Cameras
- Expressions
- Painting
- Motion tracking

4) Lighting (25%):

- Appling Lights in an Interior and creating shadows.
- Creating Lights in Cones.
- Bed Lights, Falls Lights, Table Lamps.

5) Rendering (25%):

- Concepts of Rendering.
- Scan Line Rendered.

Practical's/Submissions

1. Textures and layouts for 3D production.
2. Object modeling.

3. Virtual set.
4. Credit sequences (for films and animation).
5. 3D Animated Logo.
6. Architectural walkthroughs.

Reference books:-

- 3D Studio Max Bible - Kelly Murdock, Pub. - Wiley.
- Creating Motion Graphics with After Effects by Trish Meyer, Pub.-CMP Books
- Mastering AutoCAD 2011 and AutoCAD LT 2011 by George Omura, Pub.-Sybex.

SEMESTER - IV

Internal: 60 Marks
External: 40 Marks

AMT- 403 **Camera & Lighting Techniques Lab** **L-1 T-0 P- 6**

OBJECTIVE - The main objective of the subject is to impart the knowledge to illuminate the scene to produce a good quality as well as a pleasing picture with good camera sense.

1) Nature of light, light sources.
2) Tree point Lighting.
3) Lights & shadows in Maya.
4) Ray tracing.
5) Light Rig.
6) Mood & Ambience.
7) Maya Software renderer.
8) Introduction to Mental ray.
9) Indoor & outdoor lighting.
10) Types of conventional cameras & its functioning.
11) Lenses, exposure & focus.
12) Cameras in Maya.
13) Shot planning.
14) Motion Blur & Depth of Field.

Submissions:

1) Interior lighting (Day/Night).
2) Exterior lighting (Day/Night).
3) Character lighting.
4) Walkthrough.

Reference:

1) Maya Texturing & Lighting - Lee Lanier, Pub.-Sybex.

SEMESTER - IV

Internal: 60 Marks
External: 40 Marks

AMT-404 Texturing & Shading lab **L-1 T-0 P-4**

OBJECTIVE - The main objective of the subject is to impart the practical knowledge about Texturing & Shading in Maya.

Texturing (50%):

6) Learning the Toolbar.

7) Practice of creating basic textures.

8) Basic Wrapping of textures onto surfaces.

9) Concept of UVs.

10) Difference between 2D maps and 3D maps.

11) Tiling, Placing, Cropping, Transforming, Blurring etc. **12)**

Planar, Cylindrical, Spherical.

13) Adjusting Textures on NURBS surfaces. **14)**

Polygon Projection Techniques.

15) Basics of unwrapping the UVs.

16) Transparency.

17) Alpha layering.

18) Raytrace Options.

19) Matte Opacity.

20) Making realistic textures.

Shading (50%):

1) Other types of shaders

2) Layered Shader

3) Shading Map.

4) Utility nodes, Reverse Node.

5) Applying two materials on either sides of a surface.

6) 3D Paint.

7) Painting various attributes like Color, bump. Transparency etc.

8) Adding dust, dirt, rust etc. to an object.

9) Glossiness - Shading - Phong, Blinn, Phong E etc. 10)

Transparency - Reflection-refraction.

11) Multilister and Hypershader.

12) Mixing various Basic Shader Materials

13) Concept of Bump Maps, Creating bumps, ridges, grooves, dents etc

Practical's/Submissions

1) Textured & Shaded Interior.

2) Textured character.

3) Textured Props.

Reference books:-

1) Digital Lighting & Rendering - Jeremy Birn, Pub. - New Riders Press.

2) Maya Texturing & Lighting - Lee Lanier, Pub.-Sybex.

SEMESTER - IV

Internal: 40 Marks
External: 60 Marks

AMT-405 History of Motion Picture Industry **L-3 T-0 P-0**

OBJECTIVE - The main objective of the subject is to impart the knowledge about growth and development Motion picture industry.

1) Evolution of Cinema - the early days. **(10%)**

2) Emergence of the narrative cinema and American, German, French and Russian Cinema in the era of silent motion pictures. **(10%)**

3) Advent of sound and color in motion picture, cinemas of the world in post salient motion picture era. **(20%)**

4) Evolution of cinema in India and the current status. **(20%)**

5) Cinematograph Act 1952: Introduction and its role in Motion pictures Business. **(10%)**

6) Significant Indian Films (Synopsis, Producer, Director, Actors. **(10%)**

7) Evolution of Film Indian Animation Film Industry and its Growth. **(10%)**

8) Present scenario of Indian Film Industry. **(10%)**

Text books:-

1) Frames of Fame: A Visual Voyage through Bollywood 1913 - 2004 - Shahab Ahmed, Pub. - Landmark Ltd.

Reference books:-

2) Indian Cinema: The Bollywood Saga - Dinesh Raheja and Jitendra Kothari, Pub.- Roli Books

SEMESTER - IV

Internal: 60 Marks
External: 40 Marks

AMT-406 **Animation - Rigging Lab** **L-1 T-0 P-4**

OBJECTIVE - The main objective of the subject is to impart the practical knowledge about organic & inorganic rigging in Maya.

1) Rigging Basics, Bones and Joints, Skin, Binding.
2) Kinematics (IK & FK)
3) Requirements for a clean Model.
4) Clean UVs.
5) Binding, Smooth Binding, Rigid Binding.
6) Editing the Smooth Skin, Painting of Skin weights, Editing Skin weights, Mirror Skin Weights, Copy skin weights, Resetting Skin weights, Pruninging small weights, Normalizing Weights.
7) Creating and Editing Flexors.
8) Lattice, Sculpt, joint Cluster, Painting Cluster weights.
9) Rigging the controls.
10) Joints and hierarchies, Concept of Skeleton.
11) Connecting Joint, Removing Joint, Inserting Joint, Re-rooting Joint, Mirror Joint, Orientation of joints, Joint limits & damping.
12) Set preferred angle, Assuming preferred angle.
13) IK handle tool, IK Solvers, IK Spline, IK controls, IK handle
14) End effectors.
15) Using locators.
16) Stickiness.
17) Switching between IK/FK.
18) Adding the controls and attributes.
19) Grouping and Parenting.
20) Rigging a arm and hand, Advanced rig.

Practical's/Submissions

- Basic Biped with:

- Leg Setup
- Arm Setup
- Spine Setup
- Head Setup.

- Basic Vehicle Rig.

References books:-

1) An Introduction to Rigging in the Entertainment Industry (Applications & Techniques)
2) Art of Rigging by George Biddlecombe, Pub.- Dover Publications by Chris Higs,Pub.- Entertainment Technology Press Ltd.