DRAFT

NationalEducationPolicy-2020

CommonMinimumSyllabusforUttarakhandState Universities and Colleges
Four Year Undergraduate Programme-FYUP/HonoursProgramme/Master in ANIMATION & MULTIMEDIA

2025

PROPOSEDSTRUCTUREFORFYUP/MASTER'S ANIMATION & MULTIMEDIA
DEPARTMENTOFANIMATION & MULTIMEDIA

EXPERTCOMMITTEE

S.N.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	DR.R.C. JOSHI	PROFESSORANDHEAD	GEOGRAPHY	KUMAUNUNIVERSITY, NAINITAL
2.	DR. ANITAPANDE	PROFESSOR	GEOGRAPHY	KUMAUNUNIVERSITY, NAINITAL
3.	DR.D.C.GOSWAMI	PROFESSORANDHEAD	GEOGRAPHY	SRIDEVSUMAN UNIVERSITY,RISHIKESH
4.	DR.DEEPAKKUMAR	I/C HEAD	GEOGRAPHY	S.S.J. UNIVERSITY, ALMORA
5.	PROFS.KBANDOONI	PROFESSOR(External Expert)	GEOGRAPHY	DELHIUNIVERSITY,DELHI

DRAFTSYLLABUSPREPARATIONCOMMITTEE

S.N.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	DR.DIVYA DHYANI	ASSOCIATE PROFESSORAND HEAD	COMPUTER SCIENCE AND ANIMATION MULTIMEDIA	INSTITUTE OF TECHNOLOGY & MANAGEMENT, SDS UNIVERSITY
2.	MR. SOMYA MOHAN SHARMA	ASSISTANT PROFESSOR	ANIMATION MULTIMEDIA	INSTITUTE OF TECHNOLOGY & MANAGEMENT, SDS UNIVERSITY
3.	MR. SHYAM DUBEY	ASSISTANT PROFESSOR	ANIMATION MULTIMEDIA	INSTITUTE OF TECHNOLOGY & MANAGEMENT, SDS UNIVERSITY
4.	MR. SHIKHAR RASTOGI	ASSISTANT PROFESSOR	ANIMATION MULTIMEDIA	INSTITUTE OF TECHNOLOGY & MANAGEMENT, SDS UNIVERSITY

PROGRAMME PREREQUISITES
Any student who has passed intermediate or equivalent examination can opt for Geography in B.A./B.Sc. programme (undergraduate level).

Contents

2024
NEPTentativeCourseStructure
Animation & Multimedia

Sem	**Core**DisciplineSpecific Course (DSC) 4	**Core**Discipline Specific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credit
I	DSC **Theory(3)-**: Foundation Course in classical animation.**Practical (1)**	DSC **Theory(3)**Principles of Animation **Practical(1)–**	DSC **Theory(3)-** Graphic Design **Practical (1) –**	Choose one fromapoolof AEC courses (2)			Chooseone from a pool of courses(2)	22
II	DSC **Theory(3)**Elements of Preproduction. **Practical(1)–**	DSC **Theory(3)**2D Digital Animation **Practical(1)–**	DSC **Theory(3)**Audio & Video-Editing **Practical(1)–**	Choose one fromapoolof AEC courses (2)			Chooseone from a pool of courses (2)	22
	StudentsonexitshallbeawardedUndergraduateCertificate(intheFieldofStudy/Discipline)aftersecuringthe requisite 44 credits in Semesters I and II							44

Sem	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credit
III	DSC **Theory(3)-**: MAYA fundamentals. **Practical (1)**	DSC **Theory(3)**MAYA Modeling **Practical(1)–**	DSC **Theory(3)-** MAYA Texturing **Practical (1) –**	Choose one fromapoolof AEC courses (2)	ChooseoneSEC		Choose one fromapoolof courses (2)	22
IV	DSC **Theory(3)-**: MAYA Rigging & Skinning **Practical (1)**	DSC **Theory(3)**MAYA 3D Animation basics **Practical(1)–**	DSC **Theory(3)-** Digital Compositing **Practical (1) –**	Choose one fromapoolof AEC courses (2)	ChooseoneSEC		Choose one fromapoolof courses (2)	22
		StudentsonexitshallbeawardedUndergraduateDiploma(intheFieldofStudy/Discipline)aftersecuringtherequisite 88 credits						**Total88**

Sem.	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credits
V	DSC **Theory(3)-**: 3D Character Animation **Practical (1)**	DSC **Theory(3)**Lighting & Rendering **Practical(1)–**	DSC **Theory(3)–** Dynamics **Practical (1) –**		ChooseoneSEC OR Internship/Apprentice ship/ Project/Community Outreach(IAPC) (2)*			22
VI	DSC **Practical (8)** Minor Project (Individual)	DSC **Practical(7)** Group Project	DSC **Practical(7)** Portfolio development	**NA**	**NA**	**NA**	**NA**	22
		StudentsonexitshallbeawardedBachelorof(intheFieldofStudy/Discipline)Honours(3years)aftersecuringthe requisite 132 credits on completion of Semester VI						**Total 132**

Sem.	CoreDisciplineSpecificCourse (DSC) 4				Total Credit
VII	DSC **Theory(3)-** **Architectural Pre visualization** **Practical-** **(1)**	Dissertationon Minor (6)	Dissertationon Major (6)	Academicproject/ Entrepreneurship (6)	22
VIII	**DSC** **Theory(3)-Game Character Design** **Practical(1)**	Dissertationon Minor (6)	Dissertationon Major (6)	Academicproject/ Entrepreneurship (6)	22
		Students on exit shall be awarded Bachelor of (in the Field of Study/Discipline) (Honours with Research/Academic Projects/Entrepreneurship)or(HonorswithResearchinDiscipline-1(Major)withDiscipline-2(Minor)aftersecuringthe requisite176creditsoncompletionofSemesterVIII			Total 176

Sem.	CoreDisciplineSpecificCourse (DSC) 4				Total Credit
IX	DSC **Theory(3)** CONCEPT ART **Practical (1)**	Dissertationon Major (6)	Dissertationon Minor (6)	Academicproject/ Entrepreneurship (6)	22
X	DSC **Theory(3)** **Visual Effects Production** **Practical(1)**	Dissertationon Major (6)	Dissertationon Minor (6)	Academicproject/ Entrepreneurship (6)	22
		StudentsonexitshallbeMaster'sinCoresubjectaftersecuringtherequisite220creditsoncompletionofSemesterX			Total 220

PROGRAMMEOUTCOMES[POs]:

PO1: Technical Proficiency in Animation and Multimedia Tools: Graduates will demonstrate the ability to use industry-standard software and tools for animation, graphic design, and multimedia production, applying them effectively to create animations, visual effects, and digital content.

PO2: Creative Problem Solving and Innovation: Graduates will possess the skills to approach creative challenges in animation and multimedia design with innovative solutions, producing original and high-quality projects in various formats (2D, 3D, interactive media, etc.).

PO3: Understanding of Visual Storytelling: Graduates will be able to effectively communicate narratives through visual mediums, using principles of storytelling, cinematography, and design to create compelling multimedia content for different platforms.

PO4: Knowledge of Design Principles: Graduates will demonstrate a deep understanding of design elements such as color theory, typography, composition, and layout, applying these principles to multimedia and animation projects.

PO5: Project Management and Teamwork Skills: Graduates will be able to manage multimedia projects from concept to completion, including time management, resource allocation, and collaboration in team-based environments.

PO6: Application of Industry Standards and Ethics: Graduates will adhere to industry standards and ethical practices in the development and distribution of animation and multimedia content, ensuring high-quality and responsible production processes.

PO7: Adaptability and Continuous Learning: Graduates will be prepared to adapt to rapidly changing technologies and trends in animation and multimedia, demonstrating a commitment to lifelong learning and skill development.

ProgrammeSpecificPrerequisites: ToacquireaCertificateinany stream,astudentshouldhave passed10+2orequivalentsubjects.

Programmespecificoutcomes(PSOs*):*UGIYear/Certificatecourse Science

1. Fundamental Understanding of Animation Principles Students will develop a foundational understanding of animation concepts, techniques, and tools. They will be able to correlate their knowledge of animation with emerging trends in the media and entertainment industry.
2. Application of Creative and Technical Skills Students will be able to analyze and apply their artistic and technical skills in various forms of animation, including 2D and 3D animation. They will explore the potential of animation in different sectors such as gaming, film, and advertising. Proficiency in Software and Production Techniques
3. Expertise in animation software and production workflows will enable students to create high-quality animations. They will be equipped to justify their creative choices through research and industry-standard practices, contributing effectively to animation projects and content creation.

ProgrammeSpecificPrerequisites: ToacquireDiplomainScience,withAnimation & Multimediaasoneofthemajorsubjects,astudentshouldhaveobtainedCertificateCourseinSciencefromanyrecognized university.

Programmespecificoutcomes(PSOs):*UGIIYear/(Bachelor's of Science)*

1. **Advanced 3D Modeling & Animation Techniques:**
   Students will master advanced modeling techniques using industry-standard tools (e.g., 3DS MAX and Maya). They will learn to create both polygonal and NURBS-based models, enabling the design of complex characters, props, and environments.
2. **Rigging and Character Animation Expertise:**
   Students will develop comprehensive skills in rigging—including joint setups, skinning, and muscle systems—and apply keyframe and motion path animation techniques. This will empower them to create fluid, realistic character movements and dynamic animations.

3. **Digital Texturing, Mapping, and Shading:**
   Students will gain proficiency in digital texturing processes, including UV mapping and material creation. They will learn to apply various texture types (color, specular, bump, and displacement maps) to enhance the realism and visual appeal of 3D models.
4. **Integrated Production Workflow and Software Proficiency:**
   Students will be trained across a range of software platforms (3DS MAX, Maya, Adobe After Effects, etc.), ensuring they can integrate modeling, animation, rigging, and compositing techniques. This comprehensive workflow prepares them for multidisciplinary projects.
5. **Practical Problem-Solving and Project Execution:**
   Through hands-on practical sessions and projects, students will learn to address real-world challenges—optimizing models, managing high-poly assets, and troubleshooting technical issues—to effectively translate creative visions into polished animations.

6 Industry-Ready Skill Development and Innovation:
By engaging with current industry practices and tools, students will cultivate an innovative mindset and professional expertise. They will be equipped to adapt to evolving technological trends and contribute creatively to the animation and multimedia industries.

ProgrammeSpecificPrerequisites: ToacquireaBachelorofSciencedegree,withAnimation & Multimediaasoneofthemajor subjects, a student should have obtained Diploma Course in Science from anyrecognized university.

***Programmespecificoutcomes(PSOs):*UGIIIYear/BachelorofScience**

1. **Advanced Animation Techniques:**
   Develop expertise in 2D and 3D animation techniques, including character modeling, texturing, rigging, and rendering to create industry-standard animations.
2. **Storytelling and Visual Communication:**
   Apply principles of storytelling, cinematography, and visual effects to craft compelling narratives and engaging animated content.
3. **Technical Proficiency in Animation Software:**
   Demonstrate proficiency in industry-standard animation software such as Autodesk Maya, Adobe After Effects, and Blender for animation production.
4. **Creative and Aesthetic Development:**
   Enhance artistic skills in digital painting, concept art, and motion graphics to develop a unique visual style and design approach.

5 Professionalism and Industry Readiness:
Cultivate teamwork, project management, and problem-solving skills while adhering to industry standards, preparing for careers in film, gaming, and multimedia industries.

ProgrammeSpecificPrerequisites: ToacquireBachelor(Research)ofsciencedegree,inAnimation & Multimedia,astudentshouldhaveobtainedthree-yearBachelorofSciencedegree fromanyrecognizeduniversity.

Programmespecificoutcomes(PSOs):UGIVYear/BachelorofScience (Honours/Research)

1. **Mastery in Advanced Graphic Design:**
   Develop expertise in graphic design tools and techniques, including image manipulation, text formatting, smart object handling, and the application of filters and transformation effects to create high-quality visuals.
2. **Proficiency in Film Editing and Post-Production:**
   Gain hands-on experience in film editing, including project setup, timeline management, stop-motion animation, and documentary editing with synchronized audio and background sound.
3. **Advanced Motion Graphics and Visual Effects:**
   Understand and apply motion animation, typography, masking, overlays, and dynamic linking between software to create professional-level visual effects in film and advertisements.
4. **Sound Editing and Composition:**
   Learn the fundamentals of sound editing, including synchronization, layering audio assets, and finalizing compositions for short films, advertisements, and multi-camera productions.
5. **Industry-Ready Multimedia Skills:**
   Acquire practical skills in graphic design, film editing, and animation workflows, ensuring adaptability to industry demands in advertising, filmmaking, gaming, and multimedia production.

Programme Specific Prerequisites: To acquire Master of Science, in Animation & Multimedia, a student should have obtained three- year Bachelor of Science and one year Bachelor (research) of Science from any recognized university. Student should have research-oriented aptitude for gaining the advanced knowledge in the subject field so that he/she can apply the gained knowledge to resolve related research and professional issues.

Programmespecificoutcomes(PSOs):PGIYear/MasterofScienceinAnimation & Multimedia

1. **Advanced 3D Modeling Skills:**
   Develop expertise in topology, hard surface modeling, and the creation of inorganic models and game assets for professional-level production.
2. **UV Mapping and Unwrapping Proficiency:**
   Understand and implement different types of UV mapping, efficient unwrapping techniques, and layout optimization for texturing.
3. **Mastery in Digital Texturing:**
   Apply advanced texturing techniques using Photoshop, including bump mapping, alpha channels, and realistic material application for high-quality renders.
4. **Final Rendering and Optimization:**
   Learn industry-standard rendering techniques to achieve high-quality outputs while optimizing assets for various production pipelines.
5. **Comprehensive Understanding of Visual Effects Production:**
   Gain knowledge of the structure of VFX production, digital workflows, and essential post-production techniques.
6. **VFX Production Techniques and Implementation:**
   Develop skills in lighting for VFX, chroma key setup, and integration of live-action footage with computer-generated elements.
7. **Green Screen and Compositing Expertise:**
   Understand the principles of blue and green screen keying, compositing, and blending live-action footage seamlessly with VFX elements.
8. **VFX Coordination and Teamwork:**
   Learn to collaborate with CG and VFX teams, manage production workflows, and ensure consistency across multiple VFX shots.
9. **Technical Mastery of VFX Tools:**
   Gain hands-on experience with industry-standard software and tools for VFX production, including mixers, focal length adjustments, and lens distortion correction.
10. **Industry-Ready Production Skills:**
    Equip students with the practical skills and knowledge required for high-end animation, gaming, and film production, ensuring employability in top studios.

DEPARTMENTOFAnimation & Multimedia
B.ScAnimation & Multimedia(Semester I and II)

Sem	**Core**DisciplineSpecific Course (DSC) 4	**Core**Discipline Specific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credit
I	DSC **Theory(3)-**: Foundation Course in classical animation. **Practical (1)**	DSC **Theory(3)**Principles of Animation **Practical(1)–**	DSC **Theory(3)-** Graphic Design **Practical (1) –**	Choose one fromapoolof AEC courses (2)			Chooseone from a pool of courses(2)	22
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	StudentsonexitshallbeawardedUndergraduateCertificate(intheFieldofStudy/Discipline)aftersecuringthe requisite 44 credits in Semesters I and II							44

DEPARTMENT OF B.ScAnimation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)Foundation Course in classical animation

Programme:UnderGraduateinArts/Science	**Year:I**	**Semester: I**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Foundation Course in classical animation**

CourseOutcomes

Students will master the **12 Principles of Animation**, develop **strong drawing and storytelling skills**, and create **traditional frame-by-frame animations**, building a solid foundation for **2D, stop-motion, or 3D animation**.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**	
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1		**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	CourseContents	Lectures
Unit-I	Introduction to Experimental animation. Various visual art forms. Orientation into time and performing art form. Relevance of message and medium and a relationship. "Introduction to cut out animation. (Card board sets, houses, layouts designing)". Basics of 2D animation and 3D animation, Clay animation, Flip Books, making of flip books. Stop motion techniques. Animation set designing (Table top). Clay character modeling. Table top Model lighting. Technique of working in groups. Introduction to the equipment.	14
Unit-II	The animators drawing tools. "The animation table (light box,Field chart,line tests) The Exposure sheet(X sheet)". The Basics of traditional 2D animation. Intro to the skill, required thereof. Beginning life drawing. Use of simple shapes. How to draw drawings with the help of basic shapes Learning to draw lines, circles, ovals, scribbles, jig jag (random) patterns etc Human anatomy. Proportion study of Human body parts. Learning basic bone structure, muscle flow, head, body, hands, feet Shading techniques.	16
Unit-III	What is observation? Procedure-How to approach. Importance of guide line-Line of action. An intro on how to make drawings for animation, shapes and forms. About 2D and 3D drawings.	15
Unit-IV	Caricaturing-fundamentals, Exaggeration, Attitude, Silhouettes. Boundary breaking exercises and warm-ups, importance of scribbles, Gesture drawing, Line drawing and quick sketches. Drawings from observation, memory and imagination.	15
Practical (Credit-1)	**CourseTitle:Foundation Course in classical animation** 1. **Basic Principles of Animation:**Understanding and applying the **12 Principles of Animation** (Squash & Stretch, Anticipation, Timing, etc.) through simple exercises. 2. **Line of Action and Gesture Drawing:**Practicing quick sketches to capture motion, flow, and expression in characters. 3. **Flipbook Animation:**Creating a simple **flipbook animation** to understand frame-by-frame motion.	30

	4. **Bouncing Ball Exercise:**Animating a **bouncing ball** with different weights and timing to understand physics and movement. 5. **Pendulum and Wave Motion:**Creating a **pendulum swing** and **wave movement** to understand arcs and overlapping action. 6. **Walk Cycle Animation:**Developing a **basic walk cycle** for a human or animal character with proper weight distribution. 7. **Character Turnaround & Expression Sheet:**Drawing a **character turnaround (front, side, back views)** and an **expression sheet** showing different emotions. 8. **Lip Sync and Facial Animation:**Practicing **lip-syncing** with a short dialogue and animating facial expressions. 9. **Action & Reaction Animation:**Creating an animation sequence that involves **interaction between two characters** or objects. 10. **Final Short Animation Project:**Developing a **short animated sequence (5-10 seconds)** combining learned principles into a complete scene	

Suggested Reading:

1. Experimental animation: an illustrated anthology Robert russett and Cecile Starr.
2. The Everything Drawing Book: From Basic Shapes To People and Animals by Helen south
3. Stop Motion: Craft Skills for Model Animation by Susannah Shaw (Focal Press)
4. The ADVANCED Art of Stop-Motion Animation by Ken A. Priebe (Course Technology PTR).
5. Making Clay Animation by Nancy Smith, Melinda Kolk.
6. Clay Modeling by Sally Henry (Rosen Publishing Group)
7. Optical Illusion Flip-Book: Astounding Optical Illusions by Gyles Brandreth, Katherine Joyce (sterling publisher)
8. The Performing arts: music and dance By John Blacking, Joann W. Kealiinohomoku
9. "Modeling the Figure in Clay" by Bruno Lucchesi, Margit Malmstrom(Watson-guptill Publications)
10. THE Natural way to draw by KIMON NICOLAIDES (Mariner Books) Art of Drawing Human Body (STERLING).

DEPARTMENTOFAnimation &Multimedia

B.ScAnimation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)–Principles of Animation

Programme:UnderGraduateinArts/Science	**Year:I**	**Semester: I Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Principles of Animation**

CourseOutcomes

Students will master the **12 Principles of Animation** to create fluid, expressive, and believable motion, forming a strong foundation for professional animation in both **2D and 3D**.

Theory-(Credit-4)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):4-0-0	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Drawing for animation. Exercises and warm-ups on pegging sheet. Quick studies from real life. Sequential movement drawing.	15
Unit-II	Caricaturing the Action. Thumbnails, Drama and psychological effect. Motion studies, drawing for motion. The body language, Re-defining the drawings.	15
Unit-III	Intro to animation production process. Basic principles in animation: Squash and Stretch, Anticipation, Staging, Straight ahead and pose to pose, Follow through and overlapping action, Slow in and slow out, Arcs, Secondary action.	15
Unit-IV	Timing, Exaggeration, Solid drawing, Appeal. Mass and weight, Character acting, Volume. Line of action, Path of action, Walk cycles of animal and human.	15
Practical (Credit-1)	**CourseTitle:Principles of Animation** Here are five practical topics on the **Principles of Animation**: 1. **Squash and Stretch: Bringing Life to Motion** o How to use squash and stretch to enhance realism and exaggeration in animation. o Examples in character animation, bouncing balls, and facial expressions. 2. **Anticipation: Preparing for Action** o The role of anticipation in making movements feel natural and believable. o Techniques for applying anticipation in jumps, punches, and dialogue. 3. **Timing and Spacing: Controlling the Speed of Motion**	

	○ Understanding how timing (frame count) and spacing (positioning) affect movement. ○ Demonstrating slow vs. fast movements and their impact on storytelling. 4. **Follow-Through and Overlapping Action: Adding Realism** ○ How secondary motion (like hair, clothing, or limbs) enhances animation. ○ Practical examples of applying these principles in character animation. 5. **Exaggeration: Pushing Animation Beyond Reality** ○ How to amplify movement while keeping it believable. ○ Using exaggeration to emphasize emotions, impact, and appeal.	

SuggestedReadings:

1 Animators Survival Kit by RICHARD WILLIAMS (Faber & Faber).
2 The Animator's Workbook: Step-By-Step Techniques of Drawn Animation by Tony White.
3 Art in motion: Animation Aesthetics by Maureen Furniss.
4 Character Animation Crash Course! By Eric Goldberg.
5 Cartoon Animation (The Collector's Series) by Preston Blair.
6 Animation from Pencils to Pixels: Classical Technique by Tony White.

DEPARTMENTOFAnimation &Multimedia

B.Sc Animation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)–Graphic Design

Programme:UnderGraduateinArts/Science	**Year:I**	**Semester: I Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Graphic Design**

CourseOutcomes

Students will develop a strong foundation in **visual communication, typography, color theory, and layout design**, mastering industry-standard tools to create compelling and effective graphic designs for print and digital media.

Theory-(Credit-4)	**DistributionofmarksaccordingtheUniversityrule**

TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):4-0-0	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Illustrator Introduction, GUI Introduction to vector graphics Difference between vector and raster graphics Work space orientation-setting documents Symbols-patterns Blends, clipping paths and masks. Art work by Trace tools and live paint. Concepts of adobe illustrator, Interface, Navigation and Work spaces "About libraries, Rulers and guides, Art boards, Smart guides, Bounding box, Path tools, Pen tool, Pencil tool." About Grouping, layers, patterns, symbol. About Blends and meshes, liquify and envelope tools.	15
Unit-II	Live trace, live paint and live color. Illustrator for the web Make some graphics using lines Draw some graphics on paper by combining basic shapes Make drawing on paper to tell a folktale Draw logos for the companies by using design tools Design a text logo for magazine/Newspaper Design visiting cards Design greeting cards Design Kids magazine cover Design college magazine cover Design a brochure Make any Advertisements from newspaper Design pamphlets on any company Design information brochures on any company	15
Unit-III	Adobe Photoshop: Color Theory. Make a perfect cropping of some images using Photoshop Prepare a cutout of some images using Photoshop Place nice background for those images Prepare nice background using gradient tool Scan various images Color adjustment of those images (Photo Retouching) Convert a B&W image into color (Use variation) "Choose a theme (Music, Festivals, Sports, Dance) and Design 5-8 graphics on them." Color Modes, Color Corrections, Advanced color correction techniques (levels, Curves, Hue, Saturation etc). Design that Ad from your own style. Make Nature scene (winter) digital painting. Make Nature scene (summer) digital painting. Make digital painting (Use brush, pencil, smudge etc). Make something like modern art keeping in mind color combination.	15

Unit-IV	Make a collage of Indian art and culture. Make a collage of wildlife animals. Make a portrait of celebrity (Digital painting). Introduction to Photoshop and its interface, Navigation and All tools. Working with basic selections, advanced selections-1(on the basis of channels, color range, extract, filter etc). Exercises on selections. Quick Masks, Layer Mask, Vector Mask, Layers & Layer Blending Modes. Play with Photoshop filters-mart Filters, Filter Gallery, exercises. Bring some object and try to make it in computer. Make your own cartoon character. Design motifs tribe art. Make an animal character. "Plan a story of that character & Make its backgrounds in three/four frames". Make posters on nature/earth. Matte Painting-Composition. Creating images for the web: Exporting images from Photoshop.	15
Practical (Credit-1)	**CourseTitle:Graphic Design** Design a logo, brochure, covering letter, visiting cards. Convert a B&W image into color. Prepare a cutout of some images using Photoshop. Place nice background for those images. Prepare nice background using gradient tool. Design Ad, movie poster. Photo retouching. Make a portrait of celebrity (Digital painting).	

SuggestedReadings:

1 Adobe Illustrator CC Bible by Steve Johnson.
2 Adobe Illustrator CC Bible by Ted Alspach.
3 How to Do Everything -Adobe Illustrator CS4 by sue Jenkins.
4 Adobe Photoshop CC Classroom in a Book (Author: Adobe Creative Team) Adobe Press.
5 Teach Yourself Visually - Adobe Photoshop CS5 by Mike Wooldridge (Wiley publishing).
6 Adobe Photoshop CC Bible by steve Johnson.
7 Adobe Photoshop CC Bible by Lisa Danae Dayley & Brad Dayley.

DEPARTMENTOFAnimation &Multimedia

B.Sc Animation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)–Elements of Preproduction

Programme:UnderGraduateinScience	**Year:I**	**Semester: II Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Elements of Preproduction**

CourseOutcomes

tudents will understand the **core elements of preproduction**, including **storyboarding, character design, script development, and production planning**, to effectively conceptualize and organize projects for animation, film, and game design.

Theory-(Credit-4)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):4-0-0	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	(Includes Camera Angles/Moves, Brief about “Basics elements to compose in photography", Perspectives and Story boarding). Camera Angles/Moves Basic cinematic techniques: Pan, Tilt, Dolly (Tracking shot), Mechanical, Pull focus, Zoom, Transition, Montage, Framing terms. Composition Techniques: Camera Height, Dramatic Angle, Extreme Angle, Birds’-Eye view, Screen Direction,180 degree rule, Titled Horizon, Canted Angle, Extreme Close Up, Staging, Deep Staging, Planar Staging, Lead the Eye, 3’s and 4’s, Interior Frame, Layers, Multi-Layer Action. Crane Techniques: Crane up, Move away, Crane down, Move toward, Searching Crane, Rise up, Fall Down, Crane Front-to-Top, Crane up Entrance, Crane up Expression, Crane up Look Down, Crane down, Look up. Techniques of Movement: Character Dolly, Discovery, Pull Back retraction, Pull Back Reveal, Open up, Close out, Draw in Draw out, Spin Around, Flyover, Depth Dolly, Dolly up, Dolly Down, Spin look, Track through Solid, Vertigo, Expand Dolly, Contract Dolly, Collapse Dolly, Long Shot, Long Take, Delayed Revelation..	15
Unit-II	Techniques of Perspective: POV, Inventory POV, POV Object, POV Projectile, Tension Away, Tension to camera, Broken Wall, Voyeur, Mask Vignette, Screen, Reflection, Portal, Shadow, Silhouette, Subjective. Camera Techniques: Whip Pan, Whip Cut, Whip Zoom Look, Search up, Back to Front, Focus out, Pass out, Focus Transition Over expose Fade, Under expose Fade, Ceiling Twist, Flip Over, Shifting Angle, Sleep Over. Editing Techniques: Jump Cut, Match Cut, Impact Cut, Impact Move, Thematic Cut, Thematic Move, Subliminal Cut, Cross cut, Cut away, Freeze Frame, Look At, Multi Take, Cut Zoom In, Cut Zoom Out, Montage Sequence, Jump Cut Sequence, Split screen, Sub Clip, Super impose, Fill, Reveal Frame, Walk, Reveal Frame, Collage, Camera Snap, Photo to Scene, Impact Flash, Flashed Cut, Flashed Jump Cut. Brief about “Basics elements to	15

	compose in photography/videography": 1 2 3 4 5 6 7 8 Rule of thirds: What is rule of thirds? Written by, rule of thirds grid. Balancing elements: Composing Balancing elements like Light against dark, Colors, space, Large against small, Size, Shape, and Texture. Symmetry and Patterns: What is symmetry and what is a pattern, where they are found, how we can break them. Leading lines: What are leading lines? Different types of lines in photography: straight (Vertical), Horizontal, diagonal, curvy(s-lines), zigzag, radial. Examples and what they symbolize. "Converging lines": definition and example. Viewpoint: "What is a viewpoint? Different viewpoints like: Eye Level, Low Angle, High Angle and Dutch Angle." Depth of field: What is DOF, Factors determining DOF like aperture, focal length and distance? Framing: What is framing. What are "Headroom", "looking room", and "leading room" in framing, Framing by Vignetting? Cropping: Definition, Where and why it is used.	
Unit-III	Perspective in animation: Perspective in 1 point, 2 point, 3 point. Perspective in multiple points. Vanishing point in horizon, outside horizon and indoors, Importance of eye level. Objects in perspective: Blocks and boxes. Curves and cylinders. Human forms in perspective. Scale diagrams in perspective. Cast shadow exercise, Shapes in perspective with light and shade. Storyboarding: Elements of storyboarding Staging: Principles of staging-the center of interest, balance, framing, lighting, posterization, variety, rhythm, design. Layout: (animation levels-overlay, overlay/underlay, held level. underlay, background, camera bed)	15
Unit-IV	Transitions : Cut to, fade to/fade from, x-dissolve/cross dissolve, ripple dissolve, match cut, omit, dialog, wipe, same as /re-use, in and out, montage. Storyboard notations: OL, UL, BG, SC, SEQ, layout, transitions, dialog, action, frames, camera movement, SFX, page numbering, flop, camera shakes/jars, cont., Creating storyboard for the story with film grammar: frame, shot, scene, sequence. Analyze storyboard of a film, working with a storyboard, Visual continuity, Timing the story board. Student project-Story boarding.	15
Practical (Credit-1)	**CourseTitle:Elements of Preproduction** 1. **Scriptwriting: Crafting a Strong Narrative** o The importance of structure, character development, and dialogue. o Tips for writing engaging and visually driven scripts for animation or film. 2. **Storyboarding: Visualizing the Story** o How to break down a script into key scenes and shots. o Practical techniques for composition, camera angles, and shot continuity. 3. **Character Design: Creating Appealing and Functional Characters** o The balance between aesthetics, personality, and animation-friendly design. o How to develop character model sheets and expression sheets. 4. **Environment and Prop Design: Building the World** o The role of backgrounds, props, and color palettes in storytelling. o How to create immersive environments that enhance the narrative. 5. **Animatic Creation: Refining Timing and Pacing** o The importance of animatics in previsualizing the animation.	

	○ How to use rough timing, sound, and movement to improve the storytelling flow	

SuggestedReadings:

1 The art of layout and storyboarding by Mark t byrne.

2 Setting Up Your Shots: Great Camera Moves Every Filmmaker Should Know by Jeremy Vineyard (Michael Wiese Productions).

3 Prepare to Board! Creating Story and Characters for Animated Features and Shorts by Nancy Beiman.

4 Timing for Animation by Tom Sito.

5 How to Draw Comics the Marvel way by Stan Lee.

6 Art of drawing Human Body (Sterling).

7 Successful Drawing (Andrew Loomis).

B.Sc Animation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)–2D Digital Animation

Programme:UnderGraduateinArts/Science	**Year:I**	**Semester: II Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:2D Digital Animation**

CourseOutcomes

Students will master the fundamentals of **2D digital animation**, including **frame-by-frame animation, rigging, timing, and motion principles**, using industry-standard software to create expressive and dynamic animations.

Theory-(Credit-4)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):4-0-0	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Workspace overview -Panels (property inspector, library panel, movie explorer, history panel color panel, timeline) -Stage, Pasteboard, Tool Box. Customize the workshop Docking, minimizing, maximizing, show /hide panels/creating custom workspace, reset a predefined workspace, delete a custom workspace Using the stage and tools panel Selecting and deselecting objects on the stage, tool box overview Working with Flash documents: About flash files, (*.FLA,*.SWF,*.FLP,*.AS) Create or open a document and set its properties, View a document when multiple documents are open. Working with project, importing art work into flash Working with PSD files-PSD file import preferences (Layer Comp, Select Layer, Merge, Text Options and Flatten Etc). "Adding media to library (Images, Audio, Video), Work with libraries and its items, working with timeline, working with scenes, Find and replace command, about templates.	15
Unit-II	Drawing Basics: About vector and bitmap graphics Flash drawing module, about overlapping shapes, Using flash drawing and painting tools: Draw with pencil tools, brush tool, pen tool. Draw straight lines, Reshaping lines and shape outlines, snapping (object snapping, pixel snapping and snap alignment, working with color, strokes (ink bottle tool) and fills (Solid fill, Gradient fill, Bitmap fill). Working with graphic objects: Selection objects (lasso, magic wand, polygon tool), Moving (dragging, arrow keys, property inspector), Copying and deleting objects, Arranging objects (Stack, Align, group, Break apart groups and objects) and transforming objects (move, skew, rotate, scale).	15
Unit-III	Using symbols, instances and library assets: Symbols overview, Types of symbols(graphic, button, movie clip), Create symbols, Convert animation on the stage into a movie clip, Duplicate symbols, Edit symbols, working with symbol instances. Animation symbols. Creating animation: Animation basics, creating motion, creating key frames, Representations of animation in the timeline, Frame rates, Frame by frame animation(creating key frame, copy/paste key frame, deleting key frames etc), Onion skinning, Extend still images, Mask layers (create	15

	mask layer, link, unlink, and delete and animating the mask layers).	
Unit-IV	USING timeline effects: Twinned Animation (motion tween, shape tween, guidelines), Special effects (drop shadow, blur, glow, bevel, adjust color etc) Filter: Animation filters, Create preset filter libraries, Blend modes in Flash: Normal, layer, darken, multiply, lighten, screen, overlay, hard light, Difference, add subtract etc. Working with text Adding text, text effect, tweening, spell check, find and replace, transform, modifying. Working with Sound: Formats: WAV, MP3, AIFF, SUN AV Importing audio to the file, modifying, editing, effects and sound compression. Working with Video: Importing, embedding and creating external links to videos.	15
Practical (Credit-1)	**CourseTitle:2D Digital Animation** 1. Drawing a background scene with brush, paint bucket and pencil tool. 2. Symbols 3. Graphic (animation of a graphic object with motion tweening), 4. Movie clip (small animation with movie clip), 5. Buttons (making interactive web buttons). 6. Animation with text and putting different text effects. 7. A lip synchronization exercise with audio and character. 8. Small web file having embedded video and playing it. 9. Tweening Animation (shape tween and motion tween) 10. Walk cycles of Biped with tweening (human) 11. Walk cycles of Quadruped with tweening (animal). 12. Adding time line effects on animations created above. **13.** Mini project on flash features.	

SuggestedReadings

1 Adobe Animate Professional CC Classroom in a Book (Author: Adobe Creative Team) Adobe Press.

2 Animate + after effects by Chris Jackson (Focal press publication).

3 Animate character animation: applied studio techniques By Lee Purcell (Sams publishing).

4 Adobe Animate Catalyst CC Classroom in a Book (Author: Adobe Creative Team).

B.ScAnimation &Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)Audio & Video-Editing

Programme:UnderGraduateinArts/Science	**Year:I**	**Semester:II Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle: Audio & Video-Editing**

CourseOutcomes

Students will gain proficiency in **audio and video editing techniques**, including **cutting, transitions, sound design, color correction, and effects**, using industry-standard software to create polished and engaging multimedia content.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit-I	INTRODUCTION Analog and digital audio Basic Preferences Audio Hardware Preferences Media and Metadata Preferences The CTI and Spectral Frequency Display Working in the Waveform View Level Meters Supported File Types in Sound booth Navigating with Workspaces Working with Panels and Saving Custom Workspaces Basic Recording. Understanding various digital audio formats like .WAV, .AIFF, .MP3, .swf, .WMA etc Understanding Multichannel audio recording, synchronize audio and video. Understanding regions and play lists, editing of fields, Name markers, loops, and regions.	10
Unit-II	SOUNDFILE EDITING: Trimming, Adjusting Volume Levels Adjusting Volume with Apply Hard Limit Opening Files with Bridge Applying Fades with Fade in and Fade Out Applying and Controlling Fades Changing Volume with Key frames, Editing Key frames Adjusting Volume with the Floating Palette Combining Sound files with Mix Paste Workflow, real time editing, event based editing, waveform volume and pan envelopes. Edit, record, encode and master digital audio, editing audio by drag and drop options, cross fading audio. Tracks, balancing sound levels, creating smooth fades etc. Manipulating audio: Auto trim/crop, mute, DC offset, resample, reverse, smooth/ enhance, Fade in/out, insert silence, bit depth converter etc. Working with Multi track Projects Starting a Multi track Project Adding Tracks to an Existing Multi track Project Multi track Project Control and Tools Muting and Soloing Trimming and Fading Key framing Replacing and Moving Tracks Internal Edits Finalizing the Two-Track Mix Insert track markers, adding multiple tracks, adjusting track time, musical instrument file processing. Mixing Multiple Stems in a Multi track Project: Naming Tracks, Balancing Tracks, Finalizing the Mix. Spectral Frequency Editing : Importing Video Clips Understanding the Spectral Frequency Display Display Settings and Selection Tools Zooming and Selecting a Range of Frequencies Working with Frequency Selections Auto-Healing and its	10

	Limitations Auto-Healing Combined with Mix Paste Another Use for Mix Paste Problem Solving with Multiple Applications of Mix Creative Sound Design.	
Unit-III	Clean Up Audio: Automatic Noise Reduction Noise Reduction with a Captured Noise Print Hum Noise Reduction with a Captured Noise Print Limitations of Noise Reduction Removing Clicks and Pops, Rumble Removal. Create Loop: Create Loop Overview, Selecting and Trimming the Loop Multi tracking with Loops Equalize Volume, Match Volume. Change Pitch and Timing: Modifying a Voice Track, Modifying a Loop. Effects Overview: Working with the Effects Rack Optimizing a Voice Track Mastering a Music Track Working more with Presets Reverb, Delay, Sound level, Equalization, Special. Audio effects like: EQ, Volume, chorus, distortion, Delay/echo, pitch, bend/shift, reverb, vibrato, normalize etc. Scores: Adding and Key framing the Default Score to a Video. Key framing a Score's Intensity Key framing a Score's Parameters Using Scores Downloaded from Resource Central. Metadata: Defining Terms and Properties. Automatic S. Using Advanced Features: round trip and speech.	10
Unit-IV	Introduction: What is premiere pro, why and what for? Concept of non linear editing. Digital video principles: Video formats, frame rates, aspect ratios, progressive vs. interlaced, video outputs, compressions. Introductory project: Workflow Adding footage Time code Basic Interface of premiere pro All panels of premiere (tools, project, monitor, source, Timeline, audio meters, misc) Importing and organizing footage: Project, Sequence, Capturing, Importing, Sorting Basic video editing: Rough editing, Preliminary, Overlay edit, Layers Ripple edit, Slip edit, Razor tool, Moving edit Navigating Understand all Tools on toolbox for editing clips. The art of video editing: Job, When, Avoiding, Pacing, Establishing, Emotional Fixing, Matching. Helpful editing techniques: Markers, replacing footage, Exporting still, Alternate, Rearranging clips, Targeting, Disconnecting and Offline. Adjusting clip properties: Rubber band, Position, Anchor, Size. Playing with time: Speed, Rate, Backwards.	10
Unit - V	Attributes of video: Pixels, Frame rates, HD. Creating moving elements: Layered, Animating and Fading. Applying video transitions: Applying (various types), Effectively, Default. Working with audio: Ambient, Cutting music, Changing, Fixing, Censoring. Applying video effects: Censored, Flare, Bug, Textures Various effects: adjust, blur, sharpen, channel, color correction, Distort, generate, image control, keying, noise, perspective, Stylize, time, transition, transform utility, video. Basic compositing: Compositing, Green (keying), Blend.	10
Unit - VI	Color correction: White balance, Contrast, Luminance, Cinematic, Vignette, Night. Making titles, credits and lower thirds: Titling and superimposing, Third, Credits. Exporting video: Sequences, Media encoder, Formats, Portions, Letter boxed. Working with other applications: Other apps, Final cut.	10
Practical (Credit-1)	**CourseTitle: Audio & Video Practical** 1. Recording your own voice with sound booth 2. Using copy, cut, paste options make a new tune 3. By using mix paste option add background music to your voice 4. Add fade in and fade outs to a track 5. Make a loop of sound 6. Make a multi track composition 7. Add effects to a track 8. Add scores to a track 9. Change pith and time to a given track	30

	10. Make a speech transcription to a given track 11. Cleanup audio. 12. Making a short movie by using various clips. 13. Adding old movie sound/audio to new movie visuals and vice versa. 14. Making movie trailer by footage. 15. Creating titles in premiere. 16. Creating credits of the movie.	

Suggested Readings

1 The Sound Effects Bible: How to Create and Record Hollywood Style
2 Sound Effects. Author: Ric Viers (Michael Wiese Productions).
3 Adobe Audition CC by Luisa Winters.
4 Adobe Premiere Pro CS5 Classroom in a Book (Author: Adobe Creative Team) Adobe Press.
5 Film Editing: Great Cuts Every Filmmaker and Movie Lover Must. Know
6 Author: Gael Chandler (Michael Wiese Productions).

DEPARTMENTOFAnimation & Multimedia

B.Sc.Animation & Multimedia

(SemesterIII&IV)

Sem	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credit
III	DSC **Theory(3)-**: MAYA fundamentals .**Practical (1)**	DSC **Theory(3)**MAYA Modeling **Practical(1)–**	DSC **Theory(3)-** MAYA Texturing **Practical (1) –**	Choose one fromapoolof AEC courses (2)	ChooseoneSEC		Choose one fromapoolof courses (2)	22
IV	DSC **Theory(3)-**: MAYA Rigging & Skinning **Practical (1)**	DSC **Theory(3)**MAYA 3D Animation basics **Practical(1)–**	DSC **Theory(3)-** Digital Compositing **Practical (1) –**	Choose one fromapoolof AEC courses (2)	ChooseoneSEC		Choose one fromapoolof courses (2)	22
		StudentsonexitshallbeawardedUndergraduateDiploma(intheFieldofStudy/Discipline)aftersecuringtherequisite 88 credits						**Total88**

DEPARTMENTOFAnimation &Multimedia

B.ScAnimation &Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)MAYA fundamentals

Programme:UnderGraduateinScience		**Year: II**	**Semester:III Paper-**
Subject:Animation & Multimedia		**CourseCode:**	**CourseTitleMAYA fundamentals**
CourseOutcomes Students will gain a solid foundation in **Autodesk Maya**, learning **3D modeling, texturing, lighting, animation, and rendering** to create industry-standard assets for animation, games, and visual effects.			
Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**		
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1		**15hrsfor1 credittheory,30hrs for1creditpractical**	

Units	Contents	Lectures
Unit-I	Introduction to the interface of Maya. Creating a Project in Maya-about Project Settings. Saving Files and File Types: about .ma and .mb file types. Viewing Geometry (Navigation), reviewing the Viewport menus, Quick layout buttons, Change and resize panels, Change the display of objects.	14
Unit-II	Transforming objects, 3D coordinates: World space, object space, and local space, Freeze and reset transformations. QWERTY tool box: About Selection Tool (Q), Move Tool (W), Rotate Tool (E), Scale Tool (R) and Manipulator Tool (T). Maya user interface, Menu bar, Tool bar, Hot box. Using the shelf, construction history, hot keys, Using the spacebar, manipulating a view.	16
Unit-III	Selecting objects, types of selection. Single selection, adding and subtracting selection. Edit menu selection options. Marquee selection, Lasso selection, selection mask. Using hyper shade, hyper graph, Relationship editor and outliner. The channel box, Layer Editor, Attribute Editor, the connection editor. Duplicating objects duplicate with transform and duplicate special options. Pivot points, Grouping and Parenting. Working with Shelves, Using layers.	15
Unit-IV	Introduction to snapping (to grid, point, curves and view planes) 2D snapping and 3D snapping. Helpline, command line, range slider, command line, playback controls, script editor, MEL, preferences. Basic Introduction to Creating of Simple primitives, poly count, surface normals. Basic Introduction to materials, Basic Introduction to different Lights, Basic Introduction to camera types. Rendering a still, rendering an AVI, Rendering an image sequence.	15

Practical (Credit-1)	**CourseTitle:** **•Understanding Maya's Interface and Navigation** • Overview of Maya's workspace, menus, and tools. • Navigating the 3D viewport, hotkeys, and essential shortcuts. **•Modeling Basics: Creating 3D Objects** • How to use primitives, extrude, and manipulate polygons. • Introduction to edge loops, smoothing, and basic topology principles. **•Texturing and Materials: Applying Realistic Surfaces** • How to create and apply materials using the Hypershade. • Basics of UV mapping and texture painting. **•Lighting and Rendering: Bringing Your Scene to Life** • Introduction to different light types and their effects. • Setting up Arnold for rendering and optimizing output quality. **•Basic Animation in Maya: Bringing Objects to Motion** • Understanding keyframes, the Graph Editor, and animation principles. • Creating simple animations like bouncing balls and character movement	30

Suggested Reading:

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Introducing Maya 2023 by Dariush Derakhsha

DEPARTMENTOFAnimation & Multimedia

B.ScAnimation & Multimedia

DISCIPLINESPECIFICELECTIVE(DSE)MAYA Modelling

Programme:GraduateinScience	**Year: II**	**Semester:III Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:MAYA Modelling**

Courseoutcomes

Students will master **3D modeling in Autodesk Maya**, learning to create **high-quality characters, environments, and props** using advanced modeling techniques, topology optimization, and texturing for animation, games, and VFX..

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit-I	What is 3D Modeling? Types Of Modeling: Nurbs, polygon, subdivision. Techniques of Modeling: Poly count (low poly, high poly, polygon count), Surface hardness (object/prop, organic/characters.) Image plane for Modeling: Create, edit, or position an image plane.	15
Unit-II	Introduction to Polygons: Polygons (edge, vertex, face, vertex face, UVs), Combining, separating, and splitting, Polygon selection (object mode, sub-object mode: edge, vertex, face, vertex face, UV, edge loop, edge ring, border edge) Create polygon primitives (create polygon primitives interactively from shelf & from create menu.) Move, rotate, or scale polygon components Modifying polygon meshes(chamfer, split poly, insert edge loop tool, merge vertex, detach component, extrude, bridge, append to poly, combine ,separate, triangulate, quadrangulate, create polygon tool, sculpt geometry, smooth, mirror geometry. Converting poly and subdivision.	15
Unit-III	Nurbs Modeling: What are Nurbs? Components of Nurbs curves, degree of Nurbs curves and surfaces, moving edit points vs. Moving cvs, Bezier curves, reshape a curve or surface manually ,align a curve with a curve or surface, align surface edges ,smooth a curve ,lock or unlock the length of a curve ,straighten, smooth, curl or bend a curve ,extend a curve , extend a surface, trimming, stitching. Editing Nurbs: Duplicate Nurbs patches, project curve on surface, intersect surfaces, trim tool, un-trim surfaces, Booleans : union tool, difference tool, intersection tool, attach surfaces, attach without moving, detach surfaces, align surfaces, open/close surfaces, move seam, insert isoparms, extend surfaces, reverse surface direction, rebuild surfaces, stitch surface points.	15
Unit-IV	Putting Surfaces: Revolve, loft, planar, extrude, birail, boundary, square, bevel. Editing Curves: duplicate surface curves, attach curves, detach curves, align curves, open/close curves, move seam, cut curve, intersect curves, curve fillet, insert knot, reverse curve direction, rebuild curve, add points tool, curve editing tool, project tangent, modify curves, Bezier curves. Converting Nurbs to polygons and subdivision.	15

Practical (Credit-1)	**CourseTitle:** 1. Modeling Props and sets (Locations). 2. Modeling a high poly model. 3. Technical issues related to managing high poly model. 4. Managing the display of huge sets and models in the view port. 5. Modeling the character using templates & view port references.	30

Suggested Readings:

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Introducing Maya 2023 by Dariush Derakhs

DEPARTMENTOFAnimation & Multimedia
B.ScAnimation & Multimedia
DISCIPLINESPECIFICELECTIVE(DSE)MAYA Texturing

Programme:GraduateinScience	**Year: II**	**Semester:III Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:MAYA Texturing**

CourseOutcomes

Students will gain expertise in **texturing in Autodesk Maya**, learning **UV mapping, material creation, shading, and procedural texturing** to enhance the realism and visual appeal of 3D models for animation, games, and VFX.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1credittheory,30 hrsfor1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Introduction to UV mapping. Creating UV's (Polygons) Automatic UV mapping, Planar UV mapping, Cylindrical UV mapping, Spherical UV mapping, User-defined UV mapping, Camera UV mapping, Transfer UVs between meshes, Confirm UV placement. UV Texture editor overview UV sets: Create UV sets ,Switch between UV sets ,Duplicate, rename, or delete a UV set ,Assign a texture to a UV set ,Copy UVs from one UV set to another.	14
Unit-II	Editing UV's in Texture editor: Select UVs, Display a subset of UVs, Dolly or track within the UV Texture Editor, Display a texture behind the UVs, Delete UVs, Update a texture image after UV modification, Use the UV Texture Editor grid, Save an image of the UV layout, Modify UVs using the UV Lattice Tool, Modify UVs using the UV Smudge Tool, Separate & attach UV shells, Display overlapping UVs , Map border UVs to a square or circle, Straighten border UVs, Relax and untangle UV's, Unfold a UV mesh, Flip or rotate UV shells, Copy UVs, Color attributes between polygons.	16
Unit-III	Nurbs UV Mapping: Implicit and explicit UV set, Limitations of UV's for Nurbs in Maya. Texture Map: Color maps, Transparency maps, specular maps, Reflection maps, Bump maps, Displacement maps. Toon Shading: Assign Fill shader, Assign outline.	15
Unit-IV	Surface Materials: About surface materials. Common surface material attributes, Common surface material Specular Shading attributes.	15
Practical (Credit-1)	**Course Title:** 1. "Optimizing the final model, refining the mesh, basic posture. 2. Testing the model", Difference between hi-poly & low-poly characters. 3. Creating basic material and shader types & Procedurals. 4. Creating: Opacity, Smoothness, Secularity, and color maps, 5. Transparency, Reflection & Refraction, and Bump & Displacement Maps. 6. Unwrapping the maps for various 3d characters, objects.	30

Suggested Readings:

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Introducing Maya 2023 by Dariush Derakhs

DEPARTMENTOFAnimation & Multimedia
B.ScAnimation & Multimedia
DISCIPLINESPECIFICCORECOURSE(DSC)MAYA Rigging & Skinning

Programme:UnderGraduateinScience	**Year:II**	**Semester:IVPaper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:MAYA Rigging & Skinning**

CourseOutcomes
Students will master **rigging and skinning in Autodesk Maya**, learning to create **functional skeletons, controls, and smooth deformations** for characters and creatures, ensuring realistic movement for animation and game development.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit-I	What is rigging and why it is needed? Pivot: setting a pivot point, Group: creating groups in rigging and maintaining hierarchy, Joint tool: Introduction to bone system/Joints. Creating bone system and maintaining naming conventions, Parenting the joints and creating hierarchies in joint setup. Reroot skeleton, remove, disconnect and connect joint, Mirror joint: behavior and orientation, maintaining naming conventions. Set preferred angle.	15
Unit-II	IK handle tool: SC solver and RP Solver. IK Spline handle tool: root on curve, auto parent curve. What is Inverse kinematics and Forward Kinematics? IK and FK basics, IK and FK switch, stretchy IK and FK.	16
Unit-III	Constraints: What are constraints? Point constraint: Set point constraints, Edit point constraints, Animate target object weights. Aim constraint, Orient constraint, Scale constraint, Parent constraint, Geometry constraint, Normal constraint, Tangent constraint, Pole Vector constraint. Animation-Constraint blending, Set Driven Key-Constraint blending Animate and constrain an object Animation-Constraint blending workflow Turning all constraint nodes on or off.	14
Unit-IV	Creating Deformers: Lattice: reset lattice, remove lattice tweaks, Wrap deformer: adding and removing wrap deformer influence objects, Cluster deformer: paint cluster weight tool, soft modification tool, The bend deformer, Flare deformer, Sine deformer, squash deformer, twist deformer, wave deformer, Sculpt deformer, Jiggle deformer: paint jiggle weights tool, Wire deformer: wire deformer tools under edit deformers menu, paint wire weights tool, Wrinkle tool, Point on curve deformer, Edit deformer's options, The edit membership tool, The prune membership tool, Mirror deformer weights tool. Use of deformers in rigging process. Maintaining proper hierarchy, grouping and creating controls. Creating control objects. Creating a global controller.	16
Unit - V	Bind pose and its importance. Skinning: types of skinning. Smooth binding: Bind to options,	

	bind method and skinning method, Normalize weights, setting max influences, Drop-off rate. Interactive skin bind options. Rigid binding: bind to options, binding methods: closest point, partition set. Edit smooth skin: adding and removing influences, Paint skin weights tool, Import and export of skin weight maps, Mirror skin weight tools, Copy and smooth skin weight tools, Copy and paste vertex weights, Prune small weights, Weight normalization: disable and enable weight. Substitute geometry: Old and new geometry options/settings. Edit rigid skin: Create flexor, copy flexor, preserve skin groups options.	
Unit - VI	Introduction to Muscle system. Muscle creator and converting surface to muscle bone. Make capsule and adding locator to capsule, Setting up master muscle controller. Simple muscle: Muscle builder and muscle parameters. Muscle spline deformer, custom muscle shapes, Muscle skin setup: Applying muscle system skin deformer, Convert smooth skin to muscle system, Re-initialize setup data on muscle system, Safe delete history, Disconnect muscle objects, directions, displaces, Disconnect muscle smart collides. Setup for relative sticky deformation, Setting selected muscles as relative and non relative.	
Unit - VII	Muscle objects: connecting, disconnecting and deleting muscle objects. Base pose for muscle objects, Paint muscle weights options. Muscle Weighting: applying, saving, mirror, transfer and prune weights. Defining muscle direction. Displace: create muscle displace, connecting and dis connecting muscle displace nodes. Creating smart muscle collisions and self collision options. Muscle caching. Working with Muscle rig. Introduction to automated rigging systems and methods. "Embedding small scripts in the hierarchy control system. to save time and facilitate handling". Advanced rigging. Vertex weighting techniques. Rigging solutions to Anatomical Problems. Using advanced rigs to archive natural articulation of character.	
Practical (Credit-1)	**CourseTitle:BasiccomputerApplicationandQuantitativeTechniques:** 1. Creating a biped rig 2. Quadruped rig 3. Insect rig. 4. Mechanical rig, 5. Vehicle rig. 6. Rigging various props.	30

Suggested Reading:

An Essential Introduction to Maya Character Rigging by Cheryl Cabrera (Focal press).

DEPARTMENTOFAnimation & Multimedia
B.ScAnimation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSE)MAYA 3D Animation basics

Programme:PostGraduateinArts/Science	**Year: II**	**Semester:IV Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:MAYA 3D Animation basics**

CourseOutcomes
Students will learn the fundamentals of **3D animation in Autodesk Maya**, including **keyframing, timing, posing, and motion principles**, to create realistic and expressive character and object animations.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.	
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**	
Unit	**TourismGeography**	Lectures
Unit- I	Brief about 12 animation principles: Squash and stretch, anticipation, staging, Straight ahead action and pose to pose animation, Follow through and overlapping action, Slow In and Slow out (ease in and ease out), Arcs, secondary action, timing, exaggeration, solid drawing, appeal.	16
Unit-II	Animation Basics: Animation in Maya, Controlling animation, previewing animation Play blasting animation, Muting animation, Adding sound to your animation, Baking animation, Animation Snapshot and Animated Sweep, Turntable animation, Scene time warp effects. Animated rotation in Maya, Edit animation preferences, About Maya's timeline, about Maya's playback controls, Use the animation tools in Maya, set the appearance of key ticks in the Time Slider, Create a turntable animation, Preview, Playback and Play blast animation, Add sound to your animation, Create time warping effects, Set Animation Snapshot and Animated Sweep. Key frame Animation: Keys, Auto Key, Keys in the Attribute Editor Keys in the Channel Box, Graph Editor, and Dope Sheet, Cutting, copying, and pasting keys between scenes, Keys clipboard, Driven keys, Breakdowns, In-betweens, Key frame animation and the Graph Editor, Key frame animation and the Dope Sheet, Manipulating key frames in timeline, different ways to set key frames, pasting key frame data to other objects, Set keys, Edit keys, Set Breakdowns, Set In-betweens, Set Driven Keys, Use the Graph Editor and Dope Sheet, Edit curves, Edit keys from curves.	14
Unit-III	Nonlinear Animation: What is nonlinear animation?, Nonlinear animation tools in Maya Add audio to a sequence, Manipulate camera shots in a sequence, Play blast camera shots. Path Animation: What is path animation? Positioning your object on a path curve, orienting your object on a path curve, Animating objects along a path, manipulating your object on the motion path. Motion path markers, Marker timing, create a motion path animation,	15

	Edit motion paths Animate along a motion path, Set motion path markers. Animation Menus: Edit, Window, Animate/ Geometry Cache, Ghosting animation sequences.	
Unit-IV	Animation Windows and Editors: Animation Layer Editor, Camera Sequencer, Channel Control Editor, Dope Sheet overview, Set Driven Key window, Trax Editor, Utilizing the trax editor to blend animation clips. Graph Editor: Graph Editor overview, menu bar, About graph editor toolbar, outliner, graph view, adding or deleting keys in graph editor, Scaling keys in the graph editor, About function curves (f-curves) interpolation, Working with buffer curves, About tangent handles for fine tuning animation, Moving the key frames using set breakdown, Cycling animation in Maya, different tangents in graph editor, Animating seamless cycles, Optimizing animation data. Brief about Animation Layers in Maya.	15
Practical (Credit-1)	Course Title: **Maya3D Animation Basics**: •**Understanding Keyframes and the Timeline** • How to set, move, and delete keyframes for smooth animation. • Using the Dope Sheet for timing adjustments. **Using the Graph Editor for Smoother Motion** • Editing animation curves to create fluid movement. • Adjusting ease-in and ease-out for more natural animations. **Animating a Bouncing Ball: Mastering Timing and Spacing** • Applying the principles of squash and stretch. • Understanding how gravity and weight affect motion. **Character Rigging Basics: Understanding Controllers** • How to manipulate FK (Forward Kinematics) and IK (Inverse Kinematics). • Controlling joints, constraints, and setting up a simple rig. **Walk Cycle Animation: Bringing Characters to Life** • Breaking down the key poses (contact, passing, up, and down).	30

	• Adjusting hip movement, foot roll, and arm swings for realism.	

SuggestedReading:

1. Character animation in 3D: By Steve Roberts (Focal press)
2. Animators Survival Kit by RICHARD WILLIAMS (Faber & Faber).
3. The Animator's Workbook: Step-By-Step Techniques of Drawn Animation by Tony White.
4. Art in motion: Animation Aesthetics by Maureen Furniss.
5. Character Animation Crash Course! By Eric Goldberg.
6. Cartoon Animation (The Collector's Series) by Preston Blair.

DEPARTMENTOFAnimation & Multimedia

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DISCIPLINESPECIFICCORECOURSE–1(DSE)Digital Compositing

Programme:UnderGraduateinScience		**Year: II**	**Semester:IV Paper-**
Subject:Animation & Multimedia		**CourseCode:**	**CourseTitle:Digital Compositing**
CourseOutcomes Students will master the fundamentals of **digital compositing**, learning **layering, keying, tracking, color correction, and visual effects integration** to create seamless and professional-quality imagery for film, animation, and VFX.			
Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.		
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1		**15hrsfor1 credittheory,30hrs for1creditpractical**	

Units	Contents	Lectures
UnitI	What is compositing? Types of compositing. Various software of compositing. About Adobe after effects.	14
UnitII	Introduction to after effects. Interface. About work spaces. About project panel. About time panel. About compositing panel. About compositing settings. How to import illustrator and Photoshop files. About animation in after effects. Keying various properties like opacity, position, rotation, scale, anchor point. Copying and pasting key frames. What is pre-compose or nesting. About blending layers and compositing.	16
UnitIII	Working with video. Creating common motion graphic elements. Colour correction. Power of effects in after effects. Mastering masking and shape layers. Creating text and animating. Becoming more efficient by using markers, aligning things. About painting in after-effects. Advanced animation (puppet animation, using graph editor).	15
UnitIV	Working with Photoshop files. Project: animating elements from a photo. Playing with time. About 3d compositing in after-effects. About keying-working with green or blue screen. Stabilizing and tracking motion. Introducing mocha. About expressions. Working with audio. Mastering output. Optimizing and tweaking after-effects. Integration with other software.	15
Practical (Credit-1)	**CourseTitle:Digital Compositing:** 1. Wire removals 2. Rotoscopy 3. Colour correction 4. Keying 5. Tracking and stabilizing 6. Title effects, applying various effects.	***30***

SuggestedReading:

1. Creating motion graphics with after effects by Trish and Chris Meyer (Focal press).
2. Adobe after Effects CC Classroom in a Book (Author: Adobe Creative Team) Adobe Press.
3. After Effects Apprentice, Second Edition [Paperback] Author: Chris and Trish Meyer (focal press.)
4. The After Effects Illusionist: All the Effects in One Complete Guide by Chad Perkins (Focal press.)

DEPARTMENTOFAnimation
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(SemesterVand VI)

Sem.	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	**Core**DisciplineSpecific Course (DSC) 4	Ability Enhancement Course(AEC) 2	Discipline Specific Elective Course(DSE) 4	Skill Enhancement Course (SEC) 2	ValueAdded Course (VAC) 2	Total Credits
V	DSC **Theory(3)-**: 3D Character Animation **Practical (1)**	DSC **Theory(3)**Lighting & Rendering **Practical(1)–**	DSC **Theory(3)–** Dynamics **Practical (1) –**		ChooseoneSEC OR Internship/Apprentice ship/ Project/Community Outreach(IAPC) (2)*			22
VI	DSC **Practical (8)** Minor Project (Individual)	DSC **Practical(7)** Group Project	DSC **Practical(7)** Portfolio development	**NA**	**NA**	**NA**	**NA**	22
		StudentsonexitshallbeawardedBachelorof(intheFieldofStudy/Discipline)Honours(3years)aftersecuringthe requisite 132 credits on completion of Semester VI						**Total 132**

DEPARTMENTOFANIMATION& MULTIMEDIA

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DISCIPLINESPECIFICCORECOURSE(DSC)3D Character Animation

Programme:UnderGraduateinScience	**Year:III**	**Semester:V**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:3D Character Animation**

CourseOutcomes

Students will master the principles of **3D character animation**, learning **posing, timing, acting, and movement** to create expressive and realistic character performances using Autodesk Maya or similar industry-standard software.

Credits:03	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Producing natural articulation of realistic & semi-realistic, imaginary characters. Body language, attitude, character interaction, Animal walk& run cycles. Biped Character walk cycles. Biped Character run cycles.	14
Unit-II	Facial animation and lip-sync. Nonlinear Animation with trax editor. Working with character sets and clips. QUADRUPED Character Animation.	16
Unit- III	Character redirection. Character remapping. Using trax and clips with particle animations.	15
Unit-IV	Getting free stock motion capture files. Applying motion capture using retargeting. Working with clips to tweak motion capture files. Destructive animation with clips.	15
Practical (Credit-1)	***Course Title:*** **3D Character Animation** •**Creating a Walk Cycle: Animating Natural Movement** • Breaking down the four main poses: Contact, Passing, Up, and Down. • Adjusting weight shifts, hip movement, and arm swings for realism.	30

	•**Animating Facial Expressions: Bringing Characters to Life** • Using blend shapes and rig controllers for expressive faces. • Understanding subtle movements in the eyes, eyebrows, and mouth. •**Body Mechanics: Animating Realistic Motion** • Applying weight, balance, and momentum to character movements. • Understanding how different body parts work together in motion. •**Animating a Jump: Applying Anticipation and Follow-Through** • Breaking the motion into anticipation, takeoff, peak, and landing. • Using squash and stretch to add energy and realism. •**Animating Dialogue: Lip Sync and Performance** • Syncing mouth shapes (phonemes) to audio for realistic speech. • Adding head movements, gestures, and eye animations for natural interaction	

SuggestedReadings

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Character animation in depth (Creative professionals press) Author: Doug Kelly.
3. The Human Figure in Motion by Eadweard Muybridge.

B.Sc Animation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSC)Lighting & Rendering

Programme:UnderGraduateinScience	**Year:III**	**Semester:V**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Lighting & Rendering**

CourseOutcomes

Students will gain expertise in **lighting and rendering**, learning to create **realistic and stylized lighting setups, material shading, and optimized renders** using industry-standard techniques for animation, games, and VFX.

Credits:03	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Unit	CourseContent	Lectures
Unit-I	Introduction to CG Lighting. Working with Maya Lights 1-Point, Direct, Spot. Working with Maya Lights 2-Ambient, Area and Volume. Direct Illumination-Creating and Illuminating a Stage Show. Three Point Lighting and Exterior Lighting. Cast shadows, decay rate, Previewing lighting and shadows Creating depth map Shadow, creating ray traced shadows and radiosity. Concept of lighting system and shadows. Creating area light shadows, setting area light visibility, Creating soft shadows with spot lights.	14
Unit-II	Indirect lighting: Setting illumination for interiors Tuning global illumination, Global illumination photons Activating caustic light effects, Tuning caustic settings Setting caustic light effects on metal Using final gather for indirect lighting, tuning final gather and reusing final gather maps	16
Unit- III	Rendering and Render Setup: About rendering and renderers: Introduction to rendering, Hardware, software, and vector rendering. Renderers: Maya Software renderer, Maya Hardware renderer. Brief about Maya Vector renderer, mental ray for Maya renderer. Rendering menus: Render View , Hardware Render Buffer, Render Settings , Hyper shade , Rendering Flags, Shading Group Attributes, Approximation Editor, Custom Text Editor. Rendering Windows and Editors: Render settings: Maya Software tab: Edge anti-aliasing, Number of Samples, Multi-pixel Filtering, Contrast Threshold, Field Options, Ray tracing Quality, Motion Blur, Render Options, Memory and Performance Options, IPR Options,	15
Unit-IV	Render settings: Common tab options: Color Management, File Output, Frame Range, Renderable Cameras, Image Size, Render Options. Render View: Menu bar and View toolbar options Camera set up for rendering: Cameras: Motion blur and depth of field, Framing objects with a camera: Camera aim, Angle of view (focal length),Safe display regions for TV production, Clipping planes. Create and use a camera: Create a camera, Adjust a camera's attributes, Make an existing camera renderable, Turn scene view guidelines on or off ,Adjust depth of field, Camera limitations, Look through (select) a camera, Frame your scene. Panning and zooming in 2D Using a stereoscopic camera. Tessellation and Approximation: Tessellate NURBS surfaces, Tessellate polygonal surfaces, Tessellate subdivision surfaces.	15

Unit - V	Rendering a scene: Creating shading materials for objects, Refining shading materials for objects, Maya renderers, Rendering a single frame using IPR, Rendering using the mental ray for Maya renderer, Batch rendering a sequence of animation frames, Viewing a sequence of rendered frames. Shading surfaces: About shading and texturing surfaces, Surface Relief, Backgrounds Reflection and Environment, Atmosphere, Baking textures and Prelighting mental ray for Maya Shading, Render node utilities, Shading menus, Shading Windows and Editors, Shading Nodes. Render passes: Introducing render passes Comparing render passes and render layers Editing render passes, Using appropriate materials Batch-rendering passes, Compositing in After Effects Rendering the EXR image format Render tiles in the Maya Software renderer, Visualize interactively in the scene view, Visualize scenes and render images.	
Practical (Credit-1)	***Course Title:*** **Lighting & Rendering** **••Understanding Different Light Types in Maya** • Overview of directional, point, spot, and area lights. • How to use each light type effectively for different scenes. **•Three-Point Lighting: Creating Balanced Illumination** • Setting up key, fill, and rim lights for character and product rendering. • Adjusting light intensity and shadows for a professional look. **•Working with Arnold Renderer: Basics of Photorealistic Rendering** • Setting up Arnold lights, materials, and camera settings. • Optimizing render settings for speed and quality. **•Creating Realistic Shadows and Reflections** • Using ray tracing and soft shadows for depth and realism. • Adjusting reflection properties in shaders for believable surfaces. **•Rendering an Animation Sequence: Optimizing for Quality and Speed** • Setting up batch rendering and render layers.	30

	• Reducing noise and optimizing samples for efficient rendering.	

Suggested Readings

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Character animation in depth (Creative professionals press) Author: Doug Kelly.
3. The Human Figure in Motion by Eadweard Muybridge.

DEPARTMENTOFAnimation & Multimedia

B.Sc Animation & Multimedia

DISCIPLINESPECIFICCORECOURSE(DSE)–Maya Dynamics

Programme:UnderGraduatein Science	**Year: III**	**Semester:V Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Maya Dynamics**

CourseOutcomes

Students will master **Maya Dynamics**, learning to create realistic simulations of **particles, fluids, cloth, hair, and rigid/soft body dynamics** for visual effects, animation, and game development.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit- I	Particle tool About particle emitters Basic properties of particle shape node About cycle emission about volume emitters, emitting from surfaces, emitting from curves.	14
Unit- II	Hardware rendering of particles Reusing particle shape nodes with different emitters Colliding particles with surfaces Particle collision events Particle simulations with texture maps About sprites, sprite wizard particle conserve, emitting particles from particles Particle instancing.	16
Unit- III	Air field, drag field, gravity field Newton field, Radial field, Turbulence field, Uniform field Vortex field, Volume axis field. About goals About creation and runtime expressions	15
Unit- IV	About rigid bodies: Nail constrain, pin constrain, hinge constrain, spring constrain barrier constraints. Keying active/passive attributes About solvers Baking simulations About soft bodies: goals with soft bodies Paint weights tool for soft bodies, springs in soft body simulations Lattices in soft body simulation. Shatter effects About n-particles About fluids.	15
Practical (Credit-1)	**CourseTitle:Maya Dynamics** •**Creating Realistic Fire and Smoke with Bifrost** • Using Bifrost Aero for smoke and fire simulations.	***30***

	• Adjusting density, turbulence, and shading for realism. **•Simulating Water and Liquids with Bifrost Fluids** • Setting up realistic water splashes, waves, and pouring liquids. • Controlling viscosity for different liquid types (water, honey, lava). **•Using nCloth for Realistic Cloth Simulation** • Simulating fabric movement for clothing, flags, or curtains. • Adjusting constraints and collision settings for natural interactions. **•Creating Rigid and Soft Body Dynamics** • Simulating object destruction, bouncing balls, and squishy materials. • Controlling gravity, mass, and damping for different effects. **•Adding Particle Effects: Rain, Sparks, and Dust** • Using Maya's nParticles for environmental effects. • Adjusting emitters, lifespan, and turbulence for dynamic movement.	

SuggestedReading:

1. Mastering Autodesk Maya 2023 by Eric Keller.
2. Character animation in depth (Creative professionals press) Author: Doug Kelly.
3. The Human Figure in Motion by Eadweard Muybridge

Internship/Apprenticeship/Project/CommunityOutreach(IAPC)

Programme:UnderGraduate inBSc animation	**Year:III**	**Semester:VI**
Subject:Animation & Multimedia		
CourseCode:	**CourseTitle:**Internship/Apprenticeship/Project/CommunityOutreach(IAPC**)**	
Outcome Students will develop comprehensive expertise in **3D animation, modeling, texturing, rigging, lighting, rendering, dynamics, digital compositing, and audio-video editing**, mastering industry-standard tools like **Autodesk Maya** to create high-quality assets, animations, and visual effects for films, games, and multimedia projects.		
Credits:22	Max. Marks:100(EvaluationbyExternal&InternalExaminer) Dissertation: 75 InternalAssessment:VivaVoce+Attendance: 25(20+5)	
BSAMP: Minor project (Individual). Students to do individual project from any of the modules (Preproduction or 2danimation or 3D modelling/texturing/animation or visual effects or post production etc). BSAPD: Project &Portfolio development Students to design a project and work in a group with every individual contributing to various aspects of the project. Student to develop a portfolio for future placement and career		

DEPARTMENTOFAnimation & Multimedia

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DISCIPLINESPECIFICCORECOURSE(DSE)–Architectural previsualization

Programme:UnderGraduatein Science	**Year: III**	**Semester:VII Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Architectural previsualization**

CourseOutcomes

Students will master **architectural previsualization**, learning to create **realistic 3D models, textures, lighting, and renders** of architectural spaces using industry-standard software for effective visual storytelling and client presentations.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit- I	The 3ds Max Interface: Getting familiar with the interface, Touring the command panels Creating primitives, Navigating the viewports Understanding the concept of four view ports. Aligning object in the each view port in X, Y, Z axis Using hotkeys, Configuring the viewports Transforming objects, Using the toolbars.	14
Unit- II	Hierarchies Understanding hierarchies, Understanding reference coordinate systems, Editing pivot points, Linking objects, Animating a hierarchy. Extruding Objects Drawing a shape to extrude, Creating text, Extruding vs. beveling text. Lathing Objects Lathing pitfalls, Drawing a shape to lathe, Lathing a shape, Using the Outline command, The Shell Modifier, Changing the lathe axis.	16
Unit- III	Lofting Objects Shape vs. path, Lofting issues and problems Lofting multiple shapes, Loft deformations, Animating loft deformations Mapping a lofted object, The Sweep Modifier. Introduction to Polygonal Modeling Creating basic geometry. Sub-object vertex commands. Sub-object edge commands. Sub-object polygon commands.. Modeling with Modifiers Bend, Displace, FFD (freeform deformation), Lattice, Noise, Slice, Applying modifiers at the sub-object level, Copying and pasting modifiers, Important modifier stack issues.	15
Unit- IV	Cloning Methods Copying objects, Instancing objects, Referencing objects, The Make Unique option. Particle systems: What are particles? Understanding particle systems, Exploring standard particle types create different particle systems like Spray, Snow, Blizzard, PArray, Pcloud, Super Spray. Camera Basics Creating cameras, Understanding target and free cameras Using Camera Pan, Truck, and Dolly Adjusting the field of view, Understanding aspect ratio Showing safe frames, choosing render output size.	15

Practical (Credit-1)	CourseTitle:**Architectural previsualization** 1. Introduction to 3DS Max Interface & Navigation 2. Basic 3D Modeling Creating a Simple House 3. Materials & Texturing Applying Realistic Surfaces 4. Lighting Basics Creating a Daylight Scene 5. Camera Setup & Rendering	***30***

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DISCIPLINESPECIFICCORECOURSE(DSE)–Game Character Design

Programme:UnderGraduatein Science	**Year: III**	**Semester:VIII Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:GameCharacter Design**

CourseOutcomes

Students will master **game character design**, learning to create **concepts, 3D models, textures, rigging, and animations** for compelling and optimized characters suitable for real-time game engines.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit- I	◆ **Introduction to Game Character Design** • Role of characters in games • Difference between **realistic, stylized, and low-poly characters** • • **Understanding Character Archetypes & Silhouettes** • Hero, Villain, NPCs, Sidekicks, Enemies • Creating strong and readable silhouettes • **Anatomy Basics for Game Characters** • Human and creature anatomy for 3D modeling • Proportions and exaggeration for stylization	14
Unit- II	Introduction to Game design principles History and genres of gaming Gaming pipeline and game map(Overview)	16

Unit- III	Introduction to Unity(Interface) Learning organization of scene and files in unity Learning how to use Asset store and preview packages Learning how to implement pro-builder	15
Unit- IV	Basics of Pro-builder and snaps Creating a Game level prototype using probuilder and snaps Polishing and finalizing the prototype	15
Practical (Credit-1)	CourseTitle:Game Character Design 1. Anatomy Studies & Stylization for Games 2. Creating a Character Concept Sheet 3. Introduction to Unity & Scene Organization 4. Implementing ProBuilder & Snaps	***30***

DEPARTMENTOFANIMATION & MULTIMEDIA
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DISCIPLINESPECIFICCORECOURSE(DSC)CONCEPT ART

Programme:UnderGraduateinScience	**Year: III**	**Semester:IX Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:CONCEPT ART**

CourseOutcomes
Students will develop expertise in **concept art**, learning to create **characters, environments, props, and storyboards**, while mastering composition, lighting, and visual storytelling for games, animation, and films.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrs for1 credittheory,30 hrs for1 creditpractical**

Unit	Contents	Lectures
Unit-I	The study of different views of skeleton, movement of bones, front, back, side views of skeleton. Comparing muscle of male and female anatomy, basic difference of male anatomy, and female anatomy, muscle formations on skeleton, comparing feature, head, chest, hip, and pelvic , hand and elbow position, line difference of male and female. The study of complete animal and bird anatomy.	14
Unit-II	Creating original fantasy creatures. Writing backstories and narratives for creatures. Creating and developing creature worlds. Applying basic design solutions. Making character, creature, and environmental design choices. Understanding the history and development of creature design. Analyzing the merits and demerits of what makes a creature believable. Develop creations inspired by the history of life on this planet	16
Unit-III	Perspective drawings, Explain eye level line, vanishing line and vanishing point, teaching types of perspectives, one point perspective, two point perspective, and three point perspectives, study of perspective in buildings cape, learning inter cross measuring meatheads, applying all three perspective in basic geometrical shape, seascape, cityscape.	15
Unit-IV	Studying historical landscapes, buildings. creating fantasy world, landscapes. creating futuristic architecture, landscapes. weapons, and props. Creating architecture, landscapes. Weapons, and props for science fiction.	15
Unit - V	Types of layouts, concept and story developing, idea, script Foreground, Middle Ground and Background, Developing Drawing Skills, Shot, Angles, Building the Storyboard, study of Classic Film Examples.	

Practical (Credit-1)	**Course Title: Concept Art** 1. Silhouette Design & Character Exploration 2. Environment Concept Art – Creating Mood & Composition 3. Character Expression & Gesture Drawing 4. Prop & Weapon Design for Games & Movies 5. Creature Design – Merging Real & Fantasy Elements	30

SuggestedReading:

Eliott J Lilly, " Big Bad World of Concept Art for Video Games: An Insider's Guide for Students", Design Studio Press, 2015

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DISCIPLINESPECIFICCORECOURSE(DSE)–Visual Effects Production

Programme:UnderGraduateinScience	**Year: III**	**Semester:X Paper-**
Subject:Animation & Multimedia	**CourseCode:**	**CourseTitle:Visual Effects Production**

CourseOutcomes

Students will master **visual effects production**, learning to create **CGI, simulations, compositing, motion tracking, and dynamic effects** using industry-standard software for films, games, and animation.

Theory-(Credit-3)	**DistributionofmarksaccordingtheUniversityrule**.
TotalNo.ofLectures–Tutorials –Practical(inhoursperweek):3-0-1	**15hrsfor1 credittheory,30hrs for1creditpractical**

Units	Contents	Lectures
Unit- I	Basic Structure of Production Overview of Visual Effects Digital Workflow and its process VFX Production Techniques	14
Unit- II	Production Production Process Lighting for VFX The Science of Chroma set up for live action Blue and Green Screen Shots.	16
Unit- III	VFX coordination Use of Mixer for VFX Importance of focal length and lens distortion Production process with CG and VFX team	15

Unit- IV	Learning different channels. Uses of V-Ray render passes along with Arnold AOV's. Difference between VFX and Special Effects Creating clean plate , color correction etc.	15
Practical (Credit-1)	**CourseTitle:Visual Effects Production** Green Screen (Chroma Keying) & Compositing Creating Realistic Fire, Smoke & Explosions (Particle Effects) Motion Tracking & Object Replacement 3D Camera Projection & Matte Painting Rotoscoping & Removing Unwanted Objects	*30*

SuggestedReading:

1. The Filmmaker's Guide to Visual Effects – EranDinur
2. Rotoscoping:Techniques and Tools for the Aspiring Artist.
3. VFXpaint: Techniques and Tools for the Aspiring Artist.