B.Sc. (Animation and Game Design) 3 years.

Amity University Punjab, Mohali						
Amity School of Engineering and Technology						
Semester-Wise Programme Structure for B.Sc. Animation and Game Design (3 year) 2023-24						
Sr. No.	**Year 1**		**Year 2**		**Year 3**	
	Semester 1	**Semester 2**	**Semester 3**	**Semester 4**	**Semester 5**	**Semester 6**
1	Introduction to Computers and Programming (CSE-103) [**CU:5**; L-3, P-2] {CC}	Animation Production Process (CAS-108) [**CU:5**; L-3, P-2] {CC}	3D Modeling and Texturing [**CU:4**; L-3, P-1] {CC}	3D Character Creation [**CU:5**; L-3, P-2] {CC}	Specialization Course 1 [**CU:4**; L-3, P-1] {SE}	Specialization Course 4 [**CU:4**; L-4] {SE}
2	Principles of Animation [**CU:6**; L-4, P-2] {CC}	Introduction to Game Design (CAS-109) [**CU:5**; L-3, P-2] {CC}	3D Rigging and Animation [**CU:4**; L-3, P-1] {CC}	3D Game Design [**CU:5**; L-3, P-2] {CC}	Specialization Course 2 [**CU:4**; L-3, P-1] {SE}	Specialization Course 5 [**CU:4**; L-4] {SE}
3	Fundamentals of Design [**CU:6**; L-4, P-2] {CC}	Introduction to Computer Graphics (CAS-112) [**CU:4**; L-3, P-1] {CC}	3D Lighting and Rendering [**CU:4**; L-3, P-1] {CC}	Visual Effects [**CU:5**; L-4, P-1] {CC}	Specialization Course 3 [**CU:2**; L-2] {SE}	Entertainment Business Management [**CU:4**; L-3, P-1] {CC}
4	Basic Mathematics [**CU:3**; L-3] {AC}	Web Development (Scripting Language) (CAS-110) [**CU:4**; L-3, P-1] {CC}	Game Development Process [**CU:5**; L-4, P-1] {CC}	Video Editing Techniques [**CU:3**; L-2, P-1] {CC}	Sound Design for Visual Media [**CU:4**; L-4] {CC}	Portfolio Preparation and Presentation [**CU:2**; L-2] {CC}
5	Understanding Self for Effectiveness (PSY-101) [**CU:1**; L-1] {VAC}	Individual, Society and Nation (PSY-106) [**CU:1**; L-1] {VAC}	Camera, Photography and Cinematography [**CU:2**; L-2] {SEC}	Film Appreciation and Review [**CU:2**; L-2] {SEC}	Digital Asset Management [**CU:2**; L-2] {CC}	Industrial Training [**CU:10**] {NTCC}

6	Introduction to French Culture & Language/ Introduction to German Culture & Language (FOL-101/102) [**CU:1**; L-1] {VAC}	French Grammar/German Grammar (FOL-103)/(FOL-104) [**CU:1**; L-1] {VAC}	Programming using Python [**CU:5**; L-3, P-2] {AC}	Intellectual Property Rights and Cyber Law [**CU:4**; L-4] {AC}	Information Security [**CU:4**; L-4] {AC}	
7	Communication Skills (ENG-101) [**CU:1**; L-1] {VAC}	Communication Skills (ENG-103) [**CU:1**; L-1] {VAC}			Major Project [**CU:4**; P-4] {NTCC}	
8	Environmental Studies (ENV-101) [**CU:2**; L-2] {AEC}	Environmental Studies (ENV-106) [**CU:2**; L-2] {AEC}			Industrial Training 1 [**CU:2**] {NTCC}	
9	Punjabi/History & Culture of Punjab (INL-101/103) [**CU:1**; L-1] {AEC}	Punjabi Language & Literature (INL-104/History & Culture of Punjab for B.Sc.-II (INL-106)				
Credits	**26**	**24**	**24**	**24**	**26**	**24**
Total Programme Credits						**148**

AC	**Allied Course**	**SEC**	**Skill Enhancement Course**
AEC	**Ability Enhancement Course**	**VAC**	**Value Added Course**
CC	**Core Course**	**HUC**	**Humanities Course**
GE	**General Elective**	**BSC**	**Basic Science Course**
OE	**Open Elective**	**ESC**	**Engineering Science Course**
SC	**Skill component**	**NTCC**	**Non Teaching Credit Course**
SE	**Specialization Elective Course**		

Proposed Model Framework for B.Sc.(Animation & Game Design (2023)

Sr. No.	Category	Sem-1	Sem-II	Sem-111	Sem-IV	Sem-V	Sem-VI	Total
1.	**Core**	12	14	17	18	06	06	**74**
2.	**Allied Course**	08	04	05	04	04	00	**22**
3.	**VAC (BS)**	01	01	00	00	00	00	**02**
4.	**VAC (FBL)**	01	01	00	00	00	00	**02**
5.	**VAC (CS)**	01	01	00	00	00	00	**02**
6.	**AEC (EVS)**	02	02	00	00	00	00	**04**
7.	**AEC (HCP/Pb.)**	01	01	00	00	00	00	**02**
8.	**Skill Enhancement.**	00	00	02	02	00	00	**04**
9.	**Spl. Elet.**	00	00	00	00	10	08	**18**
10.	**NTCC**	00	00	00	00	06	10	**16**
	Total	**26**	**24**	**24**	**24**	**26**	**24**	**148**

Course: BSc (Animation and Game Design) (Batch-2023)
Program Structure
Semester I (First year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	**T**	**PS**	
1	CSE-103	Introduction to Computers and Programming	Allied Course	3	0	4	5
2		Principles of Animation	Core Course	4	0	4	6
3		Fundamentals of Design	Core Course	4	0	4	6
4		Basic Mathematics	Allied Course	3	0	0	3
4	PSY-101	Understanding Self for Effectiveness	Value Added Course (Behavioral Science)	1	0	0	1
5	FOL-101/102	Introduction to French Culture & Language/ Introduction to German Culture & Language	Value Added Course (Foreign Business Language)	1	0	0	1
6	ENG-101	Communication Skills	Value Added Course (Communication Skills)	1	0	0	1
7	ENV-101	Environmental Studies	Ability Enhancement courses	2	0	0	2
8	INL-101/103	Punjabi/History & Culture of Punjab	Ability Enhancement courses	1	0	0	1
			TOTAL	**18**	**0**	**12**	**26**

			Total Credits	Min Required: 24 Semester Credits: 26

Course Title: Introduction to Computers and Programming (CSE-103)

L	T	P/S	SW/ FW	TOTAL CREDIT UNITS
3	0	4	0	5

Course Contents/Syllabus:

	Total Teaching Hours
Unit I: Introduction to Computers	**12 H**
Introduction to Computer, history, Generations of Computer Systems, Von-Neumann architecture, Basic block diagram and functions of various components of computer, memory system (hierarchy, characteristics and types), H/W concepts (I/O Devices), S/W concepts (System S/W & Application S/W, utilities).	
Unit II: Data Representation and Programming Languages	**11 H**
Data Representation: Number systems, character representation codes, Binary, octal, hexadecimal and their inter-conversions. Binary arithmetic, floating point arithmetic, signed and unsigned numbers, Memory storage unit Concepts of Machine level, Assembly level and high level programming, Algorithms, Flow Charts and pseudo code with examples. Introduction to Operating System with its types and significance.	
Unit III: Programming Constructs	**11 H**
From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code. Arithmetic expressions and precedence, Conditional Branching and Loops. Writing and evaluation of conditions and consequent branching, Iteration and loops. Concepts of array, one and two dimensional arrays, Structures	
Unit IV: Functions & Pointers	**11 H**
Functions (including using built in libraries), Parameter passing in functions, call by value, call by reference. Recursion as a different way of solving problems. Example programs, such as finding factorial, Fibonacci series, sum of natural numbers etc. Basics of pointers, Defining pointers, pointer to pointer, pointer and arrays.	

Note: Programming may be taught in C or any other high level language.

Lab/ Practical details, if applicable: (Total 60 Hours)

Objective: The laboratory in this section has been designed to make students understand and implement the various programming concepts so that these hands on sessions can make their learning long lasting.

1. Familiarization with programming environment including file extension, header files etc.

2. Write a program for addition and subtraction of 02 numbers given by user.
3. Write a program to calculate simple interest and compound interest.
4. Write a program to interchange two numbers without using third variable.
5. Write a program to read marks of a student from keyboard whether the student is pass or fail (using if else)
6. Write a program to read three numbers from keyboard and find out maximum out of these three. (nested if else)
7. Write a program to find whether the number is odd or even.
8. Write a program for sum of n natural numbers
9. Write a program to print nth number of Fibonacci series.
10. Write a program to take 10 numbers from the user and find out the maximum and minimum number.
11. Write a program to find the position of a given number in array.
12. Write a program for matrix addition.
13. Write a program for calculating simple interest with the help of function.
14. Write a program to demonstrate the difference between call be value and call by reference.
15. Write a program to print Fibonacci series using recursion.
16. Write a program to demonstrate use of pointers.

Course Learning Outcomes:

1. Demonstrate the hardware components and software concepts of computer system along with their significance.
2. Design algorithms and flowcharts for solutions various problems.
3. Develop and debug a program using various constructs of Programming languages.
4. Design various functions and use them to improve of efficiency of program.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN	Pages
V. Rajaraman	Fundamentals of Computer Science	PHI	6th Edition, 2015	9788120350670	626
Byron Gottfried	Schaum's Outline of Programming with C	Tata McGraw-Hill	3rd Edition, 2010	9780070145900	
Brian W. Kernighan and Dennis M. Ritchie	The C Programming Language	Prentice Hall of India	2nd Edition, 1988	978-0131103627	288
E. Balaguruswamy	Programming in ANSI C	Tata McGraw-Hill	8th Edition, 2018	978935316513	600

Course Title: Principles of Animation

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	4	0	6

Course Contents/Syllabus:

	Total Teaching Hours
Unit I: Evolution of Animations	**15 H**
History and Evolution of Animations, Animation Definitions, Science behind Animation, 12 Basic Principles of Animation, Techniques of Animation: Traditional, Stop Motion, 2 D & 3D animation	
Unit II: Sketching	**15 H**
Sketching and Loosening exercises: Holding the Pencil, Straight Lines, Curved Lines, Circles, Ovals, Patterns, Scribbling, Free Hand Drawing etc., Drawing from : Observation, Memory and Imagination, Still-life Drawing – Use of Basic Shapes and Forms, Sketching Poses Study of Live Models, Attitude, Gestures, Quick Sketches, Thumbnail Sketches, Life Sketching: Line of Action, Stick Figures, Balance, Rhythm, Positive and Negative Spaces, Line of action in Simple Rice Sack, Box Ball Cylinder Form, Silhouettes, Caricaturing Fundamentals, Exaggeration.	
Unit III: Perspective Drawing	**15 H**
Perspective Drawing: Horizon/Eye Level – Vanishing Points – Orthogonal Line, One Point Perspective, Two Point Perspective, Three Point Perspective, Multi-Point Perspective, Overlapping and Intersection of Shapes in One Point, Two Point and Three Point Perspective Views, Foreshortening.	
Unit IV: Anatomy of Human Beings & Animals	**15 H**
Human Anatomy: Male and Female Anatomy – Body Structure, Proportion and Construction of Body Parts, Anatomy of Different Age Groups (Babies, Kids, Teens, Young Adults, Aged) – Basic Proportions – Basic Understanding of the Skeletal and Muscle System, Study of Poses – Human Forms in Perspective. Anatomy of Animals, Birds, Reptiles: Body Structure - Basic Forms, Proportion and Construction of Body Parts, Head, Legs, Tails - Use of Perspectives While Drawing Animals, Birds, Reptiles and Insects.	

Lab/ Practical details, if applicable: (Total 60 Hours)

Objective: The laboratory in this section has been designed to make students understand and implement the various techniques of basic animations that foundation may be laid for digital animations.

1. Familiarization with various techniques and tools available for animation design.

2. Perform exercises related to basic drawing including starlight lines, curved lines, ovals etc.
3. Perform exercises related to still life drawing.
4. Perform exercises related to thumbnail sketching and life sketching.
5. Perform exercises related to gestures.
6. Perform exercise related to one point Perspective
7. Perform exercise related to two point Perspective
8. Perform exercise related to three point Perspective
9. Perform exercise related to multi point Perspective
10. Perform exercise related to human body structure.
11. Perform exercise related to male female anatomy.
12. Perform exercise related to study of poses.
13. Perform exercise related to animal Anatomy.
14. Perform exercise related to birds Anatomy.
15. Perform exercise related to insects Anatomy.

Course Learning Outcomes:

1. Understand the Principles and techniques of animation
2. Design basic sketches for still life as well as Live models.
3. Analyze various Perspective and views.
4. Create drawings based on human and animal anatomy.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN	Pages
Andrew Loomis	Drawing the Head and Hand	Titan Books	2011	978-0857680976	160
Victor Perard	Anatomy and Drawing	New Enlarged Edition	2006	978-8190089005	200
Michael Jacobs	The Art of Composition	Forgotten Books	2018	978-0282561055	168
Joseph D'Amelio	Perspective Drawing Handbook	Dover Publications Inc.	2004	978-0486432083	96
Andrew Loomis	Figure Drawing All its worth	Titan Books; Facsimile	2011	978-0857680983	208
Burne Hogarth	Drawing Dynamic Hands	Watson-Guptill	1988	978-0823013685	144

Ken Hultgen	The Art of Animal Drawing: Construction, Action, Analysis, Caricature	Dover Publications Inc.	1993	978-0486274263	134

Course Title: Fundamentals of Design

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	4	0	6

Course Contents/Syllabus:

	Total Teaching Hours
Unit I: Introduction to Art, its evolution and existing architectural forms	**15 H**
1.Introduction to the meaning of art, culture and civilization, evolution of human culture, evolution of art forms based upon need and changes. 2. Study of cave paintings and various architectural forms in history. Narrative representation of art and materials.	
Unit II: Study of light and shade, outline drawing of still life objects	**15 H**
1. Study of light and shade in pencil of still life object 2. Drawing still life objects in outline by pen and pencil 3. Study of still life objects in pen and ink to trace the light and shade	
Unit III: Compositional scene	**15 H**
1. Understanding a scene for a background of animation/film/graphic novel etc. and preparing a sketch according to a conception 2. Drawing in details different objects and attributes of the scene in pencil and with light and shade 3. Creating a panorama view of a composition in details with perspectives and proper light and shade	
Unit IV: Development of a cartoon character	**15 H**
1. Study of different types of cartoon character 2. Creating cartoon character in reference to existing cartoon character and changing them to create characters of own idea. 3. Creating a group of character for a given story or sequence	

Lab/ Practical details, if applicable: (Total 60 Hours)

Objective: The practical in this section has been designed to make students understand and implement the various art forms so that these hands-on sessions can make their learning long lasting.

1. Familiarization with basics of art, various existing cultures and art forms.
2. Familiarization with various architectural forms of history.
3. To draw still life objects in outline by pencil.
4. To draw still life objects in outline by pen and pencil.
5. To draw still life objects in pen and ink to trace the light and shade.
6. To prepare a sketch with a conception after understanding a scene and its background.

7. To draw different objects and attributes of the compositional scene in pencil and with light and shade.
8. To create a panorama view of a composition in details with perspectives and proper light and shade.
9. To create cartoon character in reference to existing cartoon character.
10. To change the cartoon characters to create characters of own idea.
11. To create a group of character for a given story or sequence.

Course Learning Outcomes:

1. Understand various creative art activities in the past and acquire knowledge about the basics forms of arts required for animation courses.
2. Design and draw simple drawings in pencil and color about a given subject or concept or compositional scenes.
3. Develop characters with industrial standards to demonstrate the understanding of drawing.
4. Analyze the existing art forms, their limitations and interpret the historic culture in present day context.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN	Pages
Aditya Chari	Figure study made easy	Grace Prakashan	2014	978-8190089098	
Paul Wells, Samantha Moore	The Fundamentals of Animation.	Fairchild Books; 2nd edition	2016	978-1472575265	248
Milind Mulik	Perspective	Jyotsna Prakashan	2006	978-8179251119	128

Course Title: Basic Mathematics

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	0	0	3

		Teaching Hours
Module I: Sets, Relations, and Functions	**Weightage**	**15 H**
Sets, Types of Sets, Subsets, Complement of Sets, union and Intersection of Sets, Difference of Sets, Demorgan's Law, Cartesian product of Sets, relations, functions and their types, Graphs	**25%**	
Module II: Analytic Geometry		**15 H**

Introduction to Cartesian system of rectangular coordinates: Distance Formula, introduction to Lines, circles, parabola, ellipse and hyperbola; curves	**25%**	
Module III: Matrix Algebra		**15 H**
Matrices, Types of Matrices, Addition of matrices, Subtraction of matrices and Product of matrices. Properties of Matrix Multiplication. Transpose of Matrix, Symmetric and Skew-symmetric Matrices, Inverse of Matrix.	**25%**	
Module IV: Differential Calculus		**15 H**
Algebra of limits, Continuity, Derivative of a function, Fundamental rules for differentiation, Exponential and Logarithmic function, Logarithmic Differentiation, Introduction to Partial derivatives, Integration	**25%**	

Course Learning Outcomes: After studying this course students will be able to:

1. Demonstrate the ability to distinguish corresponding sets as representations of relations or functions by the analysis of graphical, numeric, or symbolic data
2. Understand and apply the concepts of parabola, ellipse and hyperbola.
3. Demonstrate the ability to apply the concept of matrices in real life situations
4. Understand the concepts of Limits, Continuity, Differentiability and Integration and their applications

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir	Thomas' Calculus (14th edition)	Pearson Education	2018	978-9353060411
James Stewart	Multivariable Calculus(8^{th} edition)	Cengage	2015	978-1305266643

COURSE TITLE: Understanding Self for Effectiveness (PSY-101)

L	T	P	Total Credits
1	**0**	**0**	**1**

Course Contents/syllabus:

	Total Teaching Hours
Unit I: Self: Core Competency	**4.5 h**
Understanding of Self, Components of Self – Self identity , Self concept, Self confidence , Self image , BIG5 Factors	
Unit II: Techniques of Self Awareness	**4.5 h**
Exploration through Johari Window, Mapping the key characteristics of self, Framing a charter for self Stages – self awareness, self acceptance and self realization	
Unit III: Self Esteem & Effectiveness	**4.5 h**

Meaning, Importance, Components of self esteem, High and low self esteem, Measuring your self esteem	
Unit IV: Building Positive Attitude and Emotional Competence	**4.5 h**
Meaning and nature of attitude, Components and Types of attitude ,Importance and relevance of attitude Emotional Intelligence – Meaning, components, Importance and Relevance Positive and negative emotions, Healthy and Unhealthy expression of emotions	

Course Learning Outcomes: At the end of this course, the students will be able to:

1. The student will apply self-introspection as a tool for self-awareness.
2. The student will understand self-concept for self-recognition, self-improvement and perception of others.
3. The student will be able to analyze their physical self, social self, the competent self and psychological self.
4. The student will be able to analyze what motivates his/her actions and the actions of others

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Singh A.	Achieving Behavioural Excellence for Success	Wiley Publication	2012	9788126580027
Towers, Marc	Self Esteem	American Media	1995	9781884926297
Pedler Mike, Burgoyne John, Boydell Tom	A Manager's Guide to Self-Development	McGraw-Hill	2006	978-0077114701
Covey, R. Stephen	Seven habits of Highly Effective People	Simon & Schuster Ltd	2013	978-1451639612
Khera Shiv	You Can Win	Macmillan	2005	978-0333937402
Gegax Tom	Winning in the Game of Life	Harmony Books	1999	978-0609603925
Singh, Dalip	Emotional Intelligence at Work	Publications	2006	9780761935322
Goleman, Daniel	Emotional Intelligence	Bantam Books	2007	9780553095036
Goleman, Daniel	ing with E.I	Bantam Books	1998	9780553104622

COURSE TITLE: Introduction to French Culture & Language (FOL-101)

L	T	P	Total Credits
1	0	0	1

Course Contents/syllabus:

	Total Teaching hours
Unit-I Introduction to French language	**3 h**
• Brief introduction of French and Francophone countries • Presenting oneself • Getting information about someone else • Greeting and taking leave • Asking/giving personal information	
Unit-II- A rendez-vous ; Visiting a place	**6 h**
• Pronouncing and writing numbers in French • Spell and count numbers • Telling the time • Temporal expressions • Communicating in class • Fixing an hour, place for a meeting. • Describing a person. • Identifying a person, object and place • Describing relation in a family • A specific person, object and place	
Unit-III- An interview	**4.5 h**
• Description of objects, people and places • Nationalities • Speaking about one's professions • Expressing Actions using regular –er ending verbs; avoir, être; reflexive verbs – usage, conjuagation • Interview of celebrity	
Unit-IV- At the discotheque	**4.5 h**
• Portrait by a journalist • Giving a positive or negative reply • Asking questions • Discussion with a person • Activities in a day	

Course Learning Outcomes: At the end of this course, the students will be able to express themselves in writing and orally in basic French. This course content focuses on the speech of the students in a lucid and a concurrent manner using appropriate vocabulary and pronunciation techniques. Extra stress will be given on their understanding of grammatical structures and the foreign accent of the language. At the end of the course, the student shall be able to :

1. Understand information; Express in his own words; Paraphrase; Interpret and translate.
2. Apply information in a new way in a practical context
3. Analyse and break-down information to create new ideas
4. Evaluate and express opinion in a given context

Text / Reference Books:

Author	Title	Publisher	Year	ISBN No

Christine Andant, Chaterine Metton, Annabelle Nachon, Fabienne Nugue	A Propos - A1 Livre De L'Eleve, Cahier D' Exercices	Langers International Private Limited	2010	978-9380809069
Manjiri Khandekar and Roopa Luktuke	Jumelage - 1 Methode De Fraincais - French	Langers International Private Limited	2020	978-9380809854
Michael Magne, Marie-Laure Lions-Olivieri	Version Originale 1: Cahier d'exercices	Maison Des Langues	2010	978-8484435617

COURSE TITLE: Introduction to German Culture & Language (FOL-102)

L	T	P	Total Credits
1	0	0	1

Course Contents/syllabus:

	Total Teaching hours
Unit-I Introduction to German Language (Einführung)	**3 h**
Introduction to German as a global language, Self-introduction and Greetings, Die Alphabeten, Phonetics: the sound of consonants and vowels, Wie buchstabieren Sie Ihren Name?	
Unit-II- Numbers and everyday conversation (die Zahl und Gespräche)	**6 h**
Counting in German from 1-100, Simple Calculation and verb 'kosten' - Wie viel kostet das? Plural Forms, Vocabulary: Wochentage, Monate, Jahreszeiten, Ordinal numbers and the question - Wann haben Sie Geburtstag?	
Unit-III- Regular verbs and nominative case: articles and pronouns (Regelmässige Verben und Nominativ Kasus: Artikel und Pronomen)	**4.5 h**
Introduction to all personal pronouns and conjugation of Regular verbs Detailed exercise on regular verbs. Reading a text on regular verbs. Introduction to definite. Vocabulary: Schulsachen und Getränke, Nominative case/ Articles (der, die, das) Nominative Pronouns: - Applicability of pronouns for both persons and things. Usage of nominative Personal Pronouns Introduction of nominative possessive pronouns usage of nominative possessive pronouns	
Unit-IV- The Family, Work-life and Professions (Familienmitglieder und Berufe) & Interrogative sentences (W-Fragen)	**4.5 h**
The Family, Work-life and Professions (Familienmitglieder und Berufe) Vocabulary: Professions and conjugation of the verb 'sein' Introduction to simple possessive pronouns with the help of the verb ‘haben’ Usage of possessive pronouns. Interrogative sentences (W-Fragen) W-Fragen: who, what, where, when, which, how, how many, how much, etc. Exercises on the question pronouns	

Course Learning Outcomes: At the end of this course, the students will be able to express themselves in writing and orally in basic German. This course content focuses on the speech of the students in a lucid and a concurrent manner using appropriate vocabulary and pronunciation techniques. Extra stress will be given on their understanding of grammatical structures and the foreign accent of the language. At the end of the course, the student shall be able to:

1. Understand information; Express in his own words; Paraphrase; Interpret and translate.
2. Apply information in a new way in a practical context
3. Analyse and break-down information to create new ideas
4. Evaluate and express opinion in a given context

Text / Reference Books:

Author	Title	Publisher	Year	ISBN
Rolf Bruseke	Starten Wir A 1	Langers International Pvt Ltd (Max Hueber Verlag)	2017	978-3190160006
Giorgio Motta	Wir Plus Grundkurs Deutsch fur Junge Lerner Book	Ernst Klelt Verlog	2011	978-8183072120
Heimy Taylor, Werner Haas	Station en Deutsch Self Study Course German Guide	Wiley	2007	978-0470165515

COURSE TITLE: Communication Skills-I (ENG-101)

L	T	P	Total Credits
1	0	0	1

Course Contents/syllabus:

	Total Teaching hours
Unit I: Basic Concepts in Communication	3.5 h
Definition of communication, Nature and process of communication, role and purpose of communication, types and channels of communication, communication networks/flow of communication: vertical, diagonal, horizontal, barriers to communication: physical, language, and semantic, socio-psychological, organizational, gateway to effective communication, towards communicative competence, choosing the appropriate channel and medium of communication, social communication: small talk and building rapport, barriers in communication.	
Unit II: Communication Types	5.5 h
Verbal communication: Oral Communication: Forms, Advantages & Disadvantages, Written Communication: Forms, Advantages & Disadvantages, Introduction of Communication Skills (Listening, Speaking, Reading, Writing), Nonverbal communication: functions and effective use, KOPPACT(Kinesics, Oculesics, Proxemics, Para-language, Artifacts, Chronemics, Tactilics). The implication of appropriate communication; effective ways of using social media, importance of digital literacy.	
Unit III: Reading and Writing Skills	3 h
Significance of reading; Reading Comprehension, gathering ideas from a given text, identify the main purpose and context of the text, evaluating the ideas, interpretation of the text, Paragraph development; essay writing.	
Unit IV: Speaking and Presentation Skills	6 h

Speaking skills: fluency, vocabulary, grammar, and pronunciation; effective speaking: selection of words, your voice, and non-verbal communication, functions of speaking: interaction, transaction, and performance; structuring the message; effective speaking strategies. Planning, preparation, practice, and performance; audience analysis, audio-visual aids, analyzing the non-verbal communication, methods of delivery: impromptu, extemporaneous, memorization, manuscript, and outlining.	

Course Learning Outcomes:

1. Students will be able to understand the basic processes of communication, both verbal as well as non-verbal—nature, scope, and power of communication processes.
2. Students will be able to demonstrate cultural sensitivity in communication and appreciation of cultural variations of diverse socio-cultural contexts.
3. Students will be able to develop an awareness of the role of mass media in shaping public psyche, beliefs, and perceptions about social realities and build an informed and critical perspective.
4. Students will be able to analyze situations and audiences to make right choices about the most effective and efficient ways to communicate and deliver messages.
5. Students will be able to assess various barriers in communication and develop communicative competence thereby for effective communication.

Books/literature

AUTHOR	TITLE	Publisher	Year of publication	ISBN
P. D. Chaturvedi and Mukesh Chaturvedi	Business Communication: Concepts, Cases and Applications	Pearson Education	2006	9788131701720
Meenakshi Raman and Prakash Singh	Business Communication	Oxford University Press	2012	9780198077053
Jeff Butterfield	Soft Skills for Everyone	Cengage Learning	2017	9789353501051

COURSE TITLE: Environmental Studies-I (ENV-101)

L	T	P	Total Credits
2	0	0	2

Course Contents/syllabus:

	Teaching hours
Unit-1- Multidisciplinary nature of environmental studies	**9 h**
Multidisciplinary nature of environmental studies: Definition, scope and importance; components of environment –atmosphere, hydrosphere, lithosphere and biosphere. Concept of sustainability and sustainable development.	
Unit-2-Ecosystems	**9 h**
Ecosystem: What is an ecosystem; Structure and function of an ecosystem; Energy flow in the ecosystem; Food chains, food webs and ecological succession. Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).	

Unit-3- Natural Resources	**9 h**
Natural resources: Land resources and land use change, land degradation, soil erosion and desertification. Deforestation: causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal population. Water Resources-Use and over-exploitation of surface and groundwater, floods, drought, conflicts over water (international and inter-state). Heating of earth and circulation of air; air mass formation and precipitation. Energy resources- renewable and non-renewable energy sources, use of alternate energy sources, Growing energy needs, Case studies.	
Unit-4- Biodiversity and its conservation	**9 h**
Biodiversity: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; biodiversity patterns and global biodiversity hot spots. India as a mega–biodiversity nation; endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; conservation of biodiversity: in-situ and ex-situ conservation of biodiversity. Ecosystem and biodiversity services: ecological, economic, social, ethical, aesthetic and information value.	

Course Learning Outcomes: At the end of this course, the students will be able to develop:

1. Appreciate the multi-disciplinary nature of environmental science
2. Understand natural resources and evaluate limitations surrounding renewable and non-renewable resources
3. Understand the nuances of ecosystem and learn about behaviour of various ecosystem
4. Learn about the types, services and threats to our biodiversity and importance of conserving it.

Text / Reference Books:

AUTHOR	**TITLE**	**Publisher**	**Year of publication**	**ISBN**
William P. Cunningham, Mary Ann Cunningham	Principles of Environmental Science	McGraw-Hill	2019	9781260219715
Dash and Dash	Fundamentals of ecology	Tata McGraw-Hill Education	2009	978-0070083660
William P. Cunningham, Mary Ann Cunningham, Barbara Woodworth Saigo	Environmental Science: A global concern,	McGraw-Hill	2021	9781260363821
Gaston K.J. and Spicer, J. I.	Biodiversity – An Introduction 2nd edition	Blackwell Publishing	2004	978-1-405-11857-6

COURSE TITLE: Punjabi (INL-101)

L	**T**	**P**	**Total Credits**
1	**0**	**0**	**1**

Course Contents/syllabus:

	Teaching hours

Unit I:	4.5 h
ਆਧੁਨਿਕਪੰਜਾਬੀਕਵਿਤਾਦਾਅਧਿਐਨ	
Unit II:	**4.5 h**
ਲੇਖਰਚਨਾ	
Unit III:	**4.5 h**
ਸੰਖੇਪਰਚਨਾ	
Unit IV:	**4.5 h**
ਵਿਆਕਰਨ :ਸਿੱਧਾਂਤਤੇਵਿਹਾਰ	

Course Learning Outcomes:

1. Understand modern Punjabi poetry.
2. Interpret the importance of essay writing
3. Analyze the essentials of composition writing.
4. Examine the impact and importance of grammar on Punjabi language.

Text / Reference Books:

ਸਹਾਇਕ ਪੁਸਤਕਾਂ :

1. ਪੰਜਾਬੀ ਸੰਚਾਰ ਯੋਗਤਾ ਅਭਿਆਸ, ਪੰਜਾਬ ਸਟੇਟ ਯੂਨੀਵਰਸਿਟੀ ਟੈਕਸਟ ਬੁੱਕ ਬੋਰਡ, ਚੰਡੀਗੜ੍ਹ।
2. ਅਗਨੀਹੋਤਰੀ, ਵੇਦ, ਪਰਿਚਾਇਕ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਦੀਪਕ ਪਬਲਿਸ਼ਰਜ਼, ਜਲੰਧਰ, 1981.
3. ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ ਅਤੇ ਹੋਰ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਭਾਗ-ਪਹਿਲਾ, ਦੂਜਾ ਤੇ ਤੀਜਾ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ , 1997.
4. ਹਰਕੀਰਤ ਸਿੰਘ (ਡਾ.), ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਨ , ਪੰਜਾਬ ਸਟੇਟ ਯੂਨੀਵਰਸਿਟੀ ਟੈਕਸਟ ਬੁੱਕ ਬੋਰਡ, ਚੰਡੀਗੜ੍ਹ, 1999
5. ਧਾਲੀਵਾਲ, ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ (ਡਾ.) 'ਸਿਧਾਂਤਕ ਭਾਸ਼ਾ ਵਿਗਿਆਨ' , ਮਦਾਨ ਪਬਲਿਕੇਸ਼ਨਜ਼, ਪਟਿਆਲਾ, 2002.
6. ਬਰਾੜ, ਬੂਟਾ ਸਿੰਘ (ਡਾ.), 'ਪੰਜਾਬੀ ਵਿਆਕਰਨ, ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ' , ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ ਲੁਧਿਆਣਾ, 2008.
7. ਜੱਸਲ ਕਵਲਜੀਤ, 'ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਦੇ ਕੁਝ ਪੱਖ' , ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਹਾਲ ਬਾਜ਼ਾਰ, ਅੰਮ੍ਰਿਤਸਰ, 2012.
8. ਮਨਜੀਤ ਕੌਰ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ : ਵਰਤੋ ਤੇ ਬਣਤਰ**, ਲੋਕਗੀਤ ਪ੍ਰਕਾਸ਼ਨ, ਚੰਡੀਗੜ੍ਹ।

ਨੋਟ:
1. ਟੈਕਸਟ ਲਈ ਹਫ਼ਤੇ ਦੇ ਛੇ ਪੀਰੀਅਡ।
2. ਕੰਪੋਜੀਸ਼ਨ ਲਈ 25-30 ਵਿਦਿਆਰਥੀਆਂ ਦਾ ਗਰੁੱਪ ਅਤੇ ਹਫ਼ਤੇ ਦੇ ਤਿੰਨ ਹੋਰ ਪੀਰੀਅਡ।
3. ਹਫ਼ਤੇ ਦੇ 6+3= 9 ਪੀਰੀਅਡ ।

COURSE TITLE: History and Culture of Punjab (INL-103)

L	T	P	Total Credits
1	0	0	1

Course Contents/syllabus

	Teaching hours
Unit I:	**4.5 h**
1. Harappan Civilization: extent and town planning and socio-economic life. 2. Life in Vedic Age: socio-economic and religious; 3. Growth and impact of Jainism and Buddhism in Panjab.	
Unit II:	**4.5 h**
4. Society and Culture under Maurayas and Guptas. 5. Bhakti movement: Main features; prominent saints and their contribution. 6. Origin and development of Sufism	
Unit III:	**4.5 h**
7. Evolution of Sikhism: teaching of Guru Nanak; Institutional Development- Manji, Masand, Sangat and Pangat 8. Transformation of Sikhism: Martyrdom of Guru Arjan; New policy of Guru Hargobind, martyrdom of Guru Tegh Bahadur. 9. Institution of Khalsa: New baptism; significance	

Unit IV:	4.5 h
10. Changes in Society in 18th century: social unrest; emergence of misls and other institutions - rakhi, gurmata, dal khalsa. 11. Society and Culture under Maharaja Ranjit Singh. 12. MAP (of undivided physical geographical map of Punjab): Major Historical Places: Harappa, Mohenjodaro, Sanghol, Ropar, Lahore, Amritsar, Kiratpur, Anandpur Sahib, Tarn Taran, Machhiwara, Goindwal, Khadur Sahib.	

Course Learning Outcomes:

1. Understand the history of various cultures in Punjab.
2. Interpret the importance of Maurayan,Gupta and Bhakti influences on Punjab
3. Apply the teaching of Sikhism on the emergence of the Khalsa .
4. Examine the impact societal changes on socio-cultural and physical landscape of Punjab

Text / Reference Books:

Author	Title	Publisher	Ed/year	ISBN No
L.M Joshi,	History and Culture of the Punjab, Part-I	Punjabi University, Patiala	1989,3rd	-
Buddha Prakash	Glimpses of Ancient Punjab	Punjabi University, Patiala,	1983	-
Khushwant Singh	A History of the Sikhs, vol I: 1469-1839, .	oxford University Press, Delhi	1991	-

Course: BSc (Animation and Game Design)
Program Structure
Semester II (First year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	T	PS	
1	CAS-108	Animation Production Process	Core Course	3	0	4	5
2	CAS-109	Introduction to Game Design	Core Course	3	0	4	5
3	CAS-112	Introduction to Computer Graphics	Core Course	3	0	2	4
4	CAS-110	Web Development (Scripting Language)	Allied Course	3	0	2	4
5	PSY-106	Individual, Society and Nation	Value Added Course (Behavioral Science)	1	0	0	1
6	FOL-103/104	French Grammar/German Grammar	Value Added Course (Foreign Business Language)	1	0	0	1

7	ENG-103	Communication Skills	Value Added Course (Communication Skills)	1	0	0	1
8	ENV-106	Environmental Studies	Ability Enhancement courses	2	0	0	2
9	INL-104/INL-106	Punjabi Language & Literature/History & Culture of Punjab for B.Sc.-II	Ability Enhancement courses	1	0	0	1
			TOTAL	**18**	**0**	**12**	**24**
			Total Credits	**Min Required: 24** **Semester Credits: 24**			

Course Title: Animation Production Process (CAS-108)

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	4	0	5

	Teaching Hours
Unit I: Design Conceptualization	**9 H**
Exploring the look and feel for animation through concept art. Planning character design, layout design, illustration style, composition, staging, backgrounds. A study of design and painting, both contemporary and traditional to understand and analyze a variety of styles and visual language	
Unit II: Pre-production	**12 H**
Story, whether adapted or original, taking the story from a verbal or spatial medium like a book or graphic novel to a form suitable for making a film, i.e., script. What makes a good story? Character, plot and genre. Understanding of archetypes and a brief introduction to the hero's journey. Character Design & Model Sheets, Layouts & Scene Planning. Storyboard design. Acting for animation. Voice-over recording. Animatics and pre-visualization.	
Unit III: Production	**12 H**
Hand-drawn animation vs 2D animation vs 3D animation. Line-tests, keyframes & Timing (extreme poses, inbetweens and holds). Creating rhythms in animation. Action layering for limited animation and full animation. Drawing key frames, breakdowns, inbetweens, animation cycles. Clean-up and scanning frames. Adding to timeline (on ones, twos or threes).	
Unit IV: Post-Production	**12 H**
Development of a film from Animatic to Edit with different scenes at different stages. Coming together of the various elements of the scene. Understanding the dynamics of camera moves and magnifications. Adding visual effects and compositing. Editing (linear vs non-linear). Voice, Music & Effects. Understanding the dynamics of sound design and use of sound as a key component of animation. Designing a sound-track for animation including music, foley, dialogue voice-overs and lip synch. Recording and mixing multiple tracks. Post-processing sound. Mixing of sound for final Edit.	

List of Experiments (Total: 60 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Learn basics of design conceptualization.
2. Understand the stages of pre-production.
3. Understand the stages of production.
4. Understand the stages of post-production.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Richard William	The Animators Survival Kit	2nd Edition, Faber and Faber	2002	978-0865478978
Shamus Culhane	Animation From Script to Screen	St. Martin's Griffin	1990	978-0312050528

Blake Snyder	Save The Cat! The Last Book on Screenwriting You'll Ever Need	Michael Wiese Productions	2005	978-1932907001
Frank Thomas and Ollie Johnston	The Illusion of Life: Disney Animation	Disney Editions	1995	978-0786860708

Course Title: Introduction to Game Design (CAS-109)

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	4	0	5

	Teaching Hours
Unit I: Game Mechanics	**15 H**
Understanding properties of matter. Making use of the wave principle, secondary action, slow and fast action impact, speed, weight, tendency of weight to move in a certain way, recoil effects, squash and stretch related to weight, overlapping action, follow through.	
Unit II: Timing	**10 H**
Gaining an insight into the invisible concept of time in nature. Understanding the basic unit of time in games. Emphasizing the difference in timing between caricature, drama, humor. Timing as instrument for governing action and movement. The use of anticipation, action, reaction.	
Unit III: Motion	**10 H**
Understanding the meaning of movement and movement in nature and what movement expresses. Awareness of how mood and feeling can be conveyed through movement and animate and inanimate object behavior. Examining the laws of motion in the context of animation; cause and effect, thrown objects, rotating, force, oscillating movement, frictio resistance.	
Unit IV: Game Physics	**10 H**
Configuring forces acting on objects, object weight, construction, flexibility, object behavior, etc. (gravity, friction, magnetism, turbulence). Determining impact parameters on moving and static objects. Studying the tendency of weight to move in a particular manner. Simplification and exaggeration of movement based on internal and external factors.	

List of Experiments (Total: 60 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.

7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Understand the principles that make games immersive and enjoyable.
2. Understand the fundamentals of game mechanics.
3. Understand importance of timing and pacing in the experience of a game.
4. Understand the basics of motion design in gameplay.
5. Understand the role of physics in video games.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Jesse Schell	The Art of Game Design: A Book of Lenses	3rd Edition, CRC Press	2019	978-1138632059
Raph Koster	Theory of Fun for Game Design	2nd Edition, O'Reilly	2013	978-1449363215
Katie Salen Tekinbas	Rules of Play: Game Design Fundamentals	The MIT Press	2003	978-0262240451
Scott Rogers	Level Up! The Guide to Great Video Game Design	2nd Edition, Wiley	2014	978-1118877166

Course Title: Introduction to Computer Graphics (CAS-112)

L	T	P/S	SW/FW	TOTAL CREDIT UNITS

3	0	2	0	4

Course Contents/syllabus:

	Teaching Hours
Unit I: Digital Images	**9 H**
Analog vs digital images. Digital colour, channels, bit depth and resolutions. Raster and vector graphics. Colour gamut and colour profiles. RGB vs CMYK.	
Unit II: Image Processing	**12 H**
Input tools like digital photography, video, digital intermediate (DI) for film, scanning and 3D digitizing. Paint and Photo retouching tools. Working with layers. Boolean operations and blend modes.	
Unit III: Image Management	**12 H**
File management tools. Understanding metadata. Organizing images based on chronolog subject, elements, project, keywords, and location. Making previews and proxies. Taggin images for quick selection.	
Unit IV: Design Tools	**12 H**
Software applications for digital design. Tools and techniques for creating and manipulating design elements. Typography, fonts and text layout. Formats and export options for print and web.	

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Understand the properties of digital images.
2. Gain the ability to acquire and process images from various sources.
3. Get a grasp of digital asset management.
4. Understand the use of design tools.
5. Understand the uses of typography.

Text / Reference Books:

AUTHOR	**TITLE**	**Publisher**	**Year of publication**	**ISBN**

Ellen Lupton	Graphic Design: The New Basics	2nd Edition, Princeton Architectural Press	2015	978-1616893323
Rafael C. Gonzalez	Digital Image Processing	4th Edition, Pearson Education	2018	978-9353062989
Radim Malinic	Book of Ideas - A Journal of Creative Direction and Graphic Design	Brand Nu	2016	978-0993540004
Ellen Lupton	Thinking with Type.	2nd Edition, Princeton Architectural Press	2010	978-1568989693

Course Title: Web Development (Scripting Languages) (CAS-110)

L	T	P/S	SW/FW	Total Credit Units
3	0	2	0	4

Course Contents/syllabus:

	Teaching Hours
Unit I: HTML and XHTML	**12 H**
Introduction to world wide web, web pages, web applications. HTML and XHTML, document structure, Images, Hypertexts, Tables, Forms, Frames, tags, attributes, List types.	
Unit II: CSS	**11 H**
CSS: Introduction, Levels of style sheets, Style specification formats, Selector and Property value forms, Font, List properties, Alignment, colour of text, The Box model, Background images, Conflict resolution.	
Unit III: Basics of Javascript	**11 H**
JavaScript: Object orientation, Variables, Operators, expressions; Screen output and keyboard input; Control statements; Objects Arrays; Functions, Regular expressions.	
Unit IV: Java Script and HTML	**11 H**
Java Script and HTML Documents, Dynamic Documents with JavaScript, Object Model; Element access, event handlers.	

Lab/ Practical details:

List of Experiments -with basic instructions (Total: 30 Hours)

Objective: The aim of this section of Lab is to teach experiments of web development pertaining to the units being taught in the theory paper specifically related to HTML, CSS and JavaScript.

1. To implement various HTML tags of document, hypertext,
2. To create web pages with HTML tables and formatting

3. To create web pages with forms, frames and list tags in HTML.
4. To add CSS sheets with formatting like alignment, color etc.
5. To implement various javascript controls like if -else, arrays etc.
6. To implement various javascript controls with conditional statements
7. To integrate javascript with HTML with basic settings.
8. To embed javascript in HTML pages with event handlers.
9. To create forms using javascript and HTML and get data from user.
10. To create multiple forms using javascript and HTML and implement various formatting options.

Course Learning Outcomes:

1. The student is expected to get familiar about the concept of web development and able to design web pages using scripting languages.
2. To understand the concepts of HTML, CSS and javascript.
3. To learn to use various tags, links and formatting used in HTML.
4. To learn and understand various styling formats in HTML documents.
5. To know how to integrate javascript with HTML pages and implement various events on web forms.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Thomas Powell	Web Design The complete Reference	Tata McGrawHill	2002	978-0072224429
Thomas Powell	HTML and XHTML The complete Reference	Tata McGrawHill	2003	9780072229424
Thomas Powell and Fritz Schneider	JavaScript 2.0 : The Complete Reference	Tata McGrawHill	2012	9780071741200
Steven M. Schafer	HTML, CSS, JavaScript, Perl, Python and PHP - Web standards Programmer‘s Reference	Wiley Publishing, Inc..	2007	978-0764588204

Course Title: INDIVIDUAL, SOCIETY AND NATION (PSY-106)

L	T	P/S	SW/FW/ PSDA	TOTAL CREDIT UNITS
1	0	0	0	1

Course Contents/syllabus:

	No. of Session
Unit-1- Individual differences & Personality	**4 H**

• Personality: Definition& Relevance • Importance of nature & nurture in Personality Development • Importance and Recognition of Individual differences in Personality • Accepting and Managing Individual differences Intuition, Judgment, Perception & Sensation (MBTI) BIG5 Factors	
Unit-2- Managing Diversity	**4 H**
• Defining Diversity • Affirmation Action and Managing Diversity • Increasing Diversity in Work Force • Barriers and Challenges in Managing Diversity	
Unit-3- Socialization, Patriotism and National Pride	**4 H**
• Nature of Socialization • Social Interaction • Interaction of Socialization Process • Contributions to Society and Nation • Sense of pride and patriotism • Importance of discipline and hard work • Integrity and accountability	
Unit-4- Human Rights, Values and Ethics	**3 H**
• Meaning and Importance of human rights • Human rights awareness • Values and Ethics- Learning based on project work on Scriptures like- Ramayana, Mahabharata, Gita etc.	

List of Professional Skill Development Activities (PSDA):

- Project on Understanding Diversity
- Term Paper on Patriotism among Youth

Course Learning Outcomes: On completion of the course:

- To recognize individual differences
- To mange individual differences
- To develop patriotic feelings
- To recognized their self in relation to society & nation

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Department of English, University of Delhi	The Individual & Society	Pearson Education	2010	978-8131704172

Umang Malhotra	Individual, Society, and the World	iUniverse	2004	978-0595662401
Tonja R. Conerly & Kathleen Holmes	Introduction to Sociology 3e	Openstax	2015	9781711493978
Daksh Tyagi	"A Nation of Idiots"	Every Protest	2019	978-8194275015

Course Title: French Grammar (FOL-103)

L	T	P/S	SW/FW	Total Credit Units
1	0	0	0	1

Course Contents/syllabus:

	Teaching Hours
Unit-I : My family and my house	**4 H**
Descriptors/Topics • Talk about your family members • Usage of possessive adjectives • Describe your house/apartment • Prepositions of location • Negation	
Unit-II- Lifestyle	**3 H**
Descriptors/Topics • Talk about your hobbies and pastimes • Usage of appropriate articles : definite and contracted • Talk about your daily routine • Usage of pronominal verbs	
Unit-III- In the city	**3 H**
Descriptors/Topics • Filling up a simple form • Ask for personal information • Usage of interrogative adjectives • Give directions about a place • Ordinal numbers • Usage of demonstrative adjectives	
Unit-IV- Week-end	**3 H**
Descriptors/Topics • Talk about your week-end plans • Usage of disjunctive pronouns • Usage of Near Future tense • Talk about weather • Write a simple post card	

Course Learning Outcomes: At the end of the course, the student shall be able to:

1. Understand information; Express in his own words; Paraphrase; Interpret and translate.
2. Apply information in a new way in a practical context
3. Analyze and break-down information to create new ideas
4. Evaluate and express opinion in a given context

Text / Reference Books:

Author	Title	Publisher	Year of Publication	ISBN No
Christine Andant, Catherine Metton, Annabelle Nachon, Fabienne Nugue,	A Propos - A1, Livre de l'élève et Cahier d'exercices.	Langers International Pvt. Ltd.	2010	978-9380809069
Collins Dictionaries	Easy Learning French Complete Grammar, Verbs and Vocabulary	Collins	2016	978-0008141721
Nikita Desai, Samapita Dey Sarkar	Apprenons La Grammaire Ensemble - French	Langers International Pvt. Ltd.	2017	978-8193002681

Course Title: German Grammar (FOL-104)

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
1	0	0	0	1

	Teaching Hours
Module I: Time (Uhrzeit); People and the World: Land, Nationalität und Sprache	**4 H**
• Introduction of time • Read text related to time and teach the students the time expressions • Exercises related to Time • Adverbs of time and time related prepositions • Vocabulary: Countries, Nationalities, and their languages • Negation: “nicht/ kein” • Ja/Nein Fragen. • All the colors and color related vocabulary, adjectives, and opposites • Exercises and comprehension for the same.	
Module II: Irregular verbs (unregelmässige Verben)	**3 H**
• Introduction to irregular verbs and their conjugation e.g. fahren, essen, lesen etc • Read a text related to the eating habits of Germans • Vocabulary: Obst, Gemüse, Kleiderstück with usage of irregular verbs • Free time and hobbies • Food and drinks	

Module III: Accusative case: articles and pronouns (Akkusativ Kasus: Artikel und Pronomen)	**3 H**
• Introduction to the concept of object (Akkusativ) • Formation of sentences along with the translation and difference between nominative and accusative articles • Usage of accusative Definite articles • Usage of accusative Indefinite articles	
Module IV: Accusative case: possessive pronouns (Akkusativ Kasus: Possessivpronomen) Family and Relationship	**3 H**
• Accusative Personal Pronouns: - Revision of the nominative personal pronouns and introduction of accusative. Applicability of pronouns for both persons and things. • Usage of accusative Personal Pronouns • Introduction of accusative possessive pronouns • Difference between nominative and accusative possessive pronouns • usage of accusative possessive pronouns	

At the end of the course, the student shall be able to:

1. Understand information; Express in his own words; Paraphrase; Interpret and translate.
2. Apply information in a new way in a practical context
3. Analyze and break-down information to create new ideas
4. Evaluate and express opinion in a given context

Text / Reference Books:

Author	**Title**	**Publisher**	**Year**	**ISBN No**
Dora Schulz, Heinz Griesbach	Deutsche Sprachlehre Fur Auslander	Max Hueber Verlag	1984	978-3190010066
Hartmut Aufderstrasse, Jutta Muller, Helmut Muller	Themen Aktuell: Glossar Deutsch	Max Hueber Verlag	2003	978-3190816903
Giorgio Motta	Wir Plus Grundkurs Deutsch fur Junge Lerner Book German Guide	Goyal Publishers	2011	9788183072120

Course Title: Communication Skills—II (ENG-103)

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
1	0	0	0	1

Course Contents/syllabus:

	Teaching Hrs (H)
Unit I: Basic Concepts in Communication	3 H

Towards communicative competence; choosing the appropriate channel and medium of communication; ways to develop communication skills in the areas of Listening, Speaking, Reading, and Writing.	
Unit II: Communication Types	4 H
Nonverbal communication: detailed analysis, KOPPACT (Kinesics, Oculesics, Proxemics, Paralanguage, Artefacts, Chronemics, Tactilics).	
Unit III: Communication and Technology	3 H
Importance of digital literacy and communication on digital platforms.	
Unit IV: Presentation Skills	5 H
Planning, preparation, practice, and performance; audience analysis, audio-visual aids, analyzing the non-verbal communication, methods of delivery: impromptu, extemporaneous, memorization, manuscript, and outlining.	

Course Learning Outcomes:

1. Students will be able to understand the need and the methods required to develop communication skills in the areas of listening, speaking, reading, and writing.
2. Students will be able to understand the significance of non-verbal communication in various contexts.
3. Students will be able to develop an awareness of the role of digital platforms in shaping public psyche, beliefs, and perceptions about social realities and build an informed and critical perspective.
4. Students will be able to develop and upgrade their presentation skills.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
P. D. Chaturvedi and Mukesh Chaturvedi	Business Communication: Concepts, Cases and Applications	Pearson Education	2006	9788131701720
Meenakshi Raman and Prakash Singh	Business Communication	Oxford University Press	2012	9780198077053
Jeff Butterfield	Soft Skills for Everyone	Cengage Learning	2017	9789353501051

Course Title: Environmental Studies (ENV-106)

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

	Total Hours

Unit-1- Environmental Pollution	**9 hours**
Environmental Pollution: types, Cause, effects and controls –Air, water, soil, chemical and noise pollution. Nuclear hazard and human health risk Solid waste Management-control measures of urban and industrial waste. Pollution case studies.	
Unit-2- Environmental Policies and practices	**9 hours**
Environmental Policies and practices: Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment laws: Environment Protection Act; Air (Prevention and Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act, international agreements: Montreal and Kyoto protocols and convention on biological diversity(CBD), The Chemical Weapons Convention (CWC). Natural reserves, tribal population and rights and Human-wildlife conflict in Indian context.	
Unit-3- Human communities and the Environment	**9 hours**
Impacts on environment, human health and welfare. Carbon foot-print. Resettlements and rehabilitation of project affected persons, case studies. Disaster management: floods, earthquake, cyclone and landslides. Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. Environmantal ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).	
Unit-4- Field work	**9 hours**
• Visit to an area to document environmental assets: river/forest/flora/fauna, etc. • Visit to local polluted Site-Urban/Rural/Industrial/Agricultural • Study of common plants, insects, birds and basic principles of identification. • Study of simple ecosystems-pond, river, Delhi Ridge, etc.	

Course Learning Outcomes: At the end of this course, the students will be able to develop:

1. Understanding the types of pollution and their impact on environment and human health.
2. Understand the environmental concerns and their impact on humans and agriculture.
3. Able to analyse the impacts of natural and manmade disaster on human population and settlements.
4. Sensitization about the environmental issues and concerns leading to proactive actions to improve the environmental conditions in our daily life.
5. Able to imbibe practical approach and solution to solve environmental concerns.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
William P. Cunningham, Mary Ann Cunningham	Principles of Environmental Science	McGraw-Hill	2019	9781260219715
William P. Cunningham, Mary Ann Cunningham, Barbara Woodworth Saigo	Environmental Science: A global concern,	McGraw-Hill	2021	9781260363821
Gurjar B. R., Molina L.T., Ojha C.S.P. (Eds.)	Air Pollution: Health and Environmental Impacts	CRC	2010	9781439809624
Elaine M.A. and Bugyi G.(Eds.)	Impact of Water Pollution on Human Health and Environmental Sustainability (Practice, Progress, and Proficiency in Sustainability)	Idea Group, U.S	2016	978-1466695597
Bryant E.	Natural Hazards, 5th Edition	Cambridge University Press	2004	978-0521537438
Keith Smith	Environmental Hazards Assessing Risk and Reducing Disaster	Oxford University Press	2013	978-0415681063

Course Title: History and Culture of Punjab (INL106)

L	T	P/S	SW/FW	Total Credit Units
1	0	0	0	1

Course Contents/syllabus:

	Weightage (%)
Unit I:	**4H**
1. Introduction of Colonial Rule in Punjab: Annexation of Punjab; Board of Administration. 2. Western Education: Growth of Education and rise of middle classes. 3. Agrarian Development: Commercialization of agriculture; canalization and colonization.	
Unit II:	**4H**
4. Early Socio Religious Reform: Christian Missionaries; Namdharis; Nirankaris. 5. Socio Religious Reform Movements: activities of Arya Samaj; Singh sabhas; Ahmadiyas; Ad Dharam Movement 6. Development of Press & literature: growth of print technology; development in literature	
Unit III:	**4H**
7. Emergence of Political Consciousness: Gadar Movement; Jallianwala Bagh Massacre	

8. Gurudwara Reform Movement; major Morchas; Activities of Babbar Akalis. 9. Struggle for Freedom: Non-Cooperation Movement; HSRA and Bhagat Singh; Civil Disobedience Movement; Quit India Movement.	
Unit IV:	**3H**
10. Partition and its Aftermath: resettlement; rehabilitation 11. Post-Independence Punjab: Linguistic Reorganization; Green Revolution.	

Course Learning Outcomes:

Understand the history of Punjab region in modern times.
Interpret the importance early socio religious reform, movements, developments.
Examine the contribution of major reform movements: Gadar, Babbar Akalis and Gurdwara reform morchas.
Examine the impact of Partition of Punjab and major changes in Punjab after independence.

Text / Reference Books:

1. Singh, Kirpal: **History and Culture of the Punjab, Part II (Medieval Period**), Publication Bureau, Punjabi University, Patiala 1990(3rd ed.).

2. Singh, Fauja(ed.): **History of the Punjab, Vol.III,** Punjabi University, Patiala 1972.

3. Grewal, J.S.: **The Sikhs of the Punjab**, the New Cambridge History of India, Orient Longman, Hyderabad,1990.

4. Singh, Khushwant: **A History of the Sikhs, vol I: 1469-1839**, oxford University Press, Delhi, 1991.

5. Chopra, P.N., Puri, B.N**.: A Social, Cultural and Economic History of India**, Vol.II, And Das, M.N. Macmillan, Delhi, 1974.

Course Title: Punjabi Language & Literature (INL-104)

L	T	P/S	SW/FW	Total Credit Units
1	0	0	0	1

Course Contents/syllabus:

Unit I:	**4H**
ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਅਧਿਐਨ(ਕਥਾ ਕਹਾਣੀ)	
Unit II:	**4H**
ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ	
Unit III:	**4H**
ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਆਕਰਨ ਅਤੇ ਬਣਤਰ 1. ਪੰਜਾਬੀ ਅਰਥ ਬੋਧ 2. ਪੰਜਾਬੀ ਵਾਕ ਬੋਧ	
Unit IV:	**3H**
ਪੰਜਾਬੀ ਭਾਸ਼ਾ: ਲਿੱਪੀ ਅਤੇ ਉਪਭਾਸ਼ਾਵਾਂ 1. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਗੁਰਮੁਖੀ ਲਿੱਪੀ 2. ਭਾਸ਼ਾ, ਉਪਭਾਸ਼ਾ,ਟਕਸਾਲੀ ਭਾਸ਼ਾ ਅਤੇ ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਵਾਂ	

Course Learning Outcomes:

1. Understand modern Punjabi Stories.
2. Interpret the importance of letter writing
3. Analyze the Punjabi language structure and grammar.

4. Examine the impact and importance of Punjabi dialects and Gurmukhi script on Punjabi language.

ਹਵਾਲਾ ਪੁਸਤਕ-ਸੂਚੀ:

1. ਡਾ. ਧਨਵੰਤ ਕੌਰ (ਸੰਪਾ.), **ਕਥਾ ਕਹਾਣੀ**, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਚੰਡੀਗੜ੍ਹ.
2. ਸੁਰਿੰਦਰ ਸਿੰਘ ਖਹਿਰਾ (ਸੰਪਾ.), **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਆਕਰਨ ਅਤੇ ਬਣਤਰ**,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ,ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ ਪਟਿਆਲਾ,2015.
3. ਡਾ.ਹਰਕੀਰਤ ਸਿੰਘ, **ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਅਤੇ ਲੇਖ ਰਚਨਾ**, ਪੰਜਾਬ ਸਟੇਟ ਯੂਨੀਵਰਸਿਟੀ ਟੈਕਸਟ ਬੁੱਕ ਬੋਰਡ,ਚੰਡੀਗੜ੍ਹ,1999.
4. ਡਾ. ਹਰਬੰਸ ਸਿੰਘ ਧੀਮਾਨ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਵਿਆਕਰਣ**, ਸੰਗਮ ਪਬਲੀਕੇਸ਼ਨ, ਸਮਾਣਾ,2014.
5. ਡਾ. ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ ਸਿੰਘ, **ਸਿਧਾਂਤਕ ਭਾਸ਼ਾ ਵਿਗਿਆਨ**, ਮਦਾਨ ਪਬਲੀਕੇਸ਼ਨਜ਼,ਪਤਿਆਲਾ, 2002.
6. ਡਾ. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ**, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਪੰਜਾਬੀ ਭਵਨ,ਲੁਧਿਆਣਾ,2012.
7. ਡਾ. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਸ੍ਰੋਤ ਅਤੇ ਸਰੂਪ**, ਵਾਰਿਸ ਸ਼ਾਹ ਫ਼ਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ,2012
8. ਦੁਨੀ ਚੰਦ੍ਰ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਣ**, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਚੰਡੀਗੜ੍ਹ.
9. ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ ਅਤੇ ਹੋਰ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ (ਭਾਗ 1,2,3),**ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ ਜਲੰਧਰ.
10. ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ**, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ ਜਲੰਧਰ,2010.

Course: BSc (Animation and Game Design)
Program Structure
Semester III (2nd year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	T	PS	
1		3D Modeling and Texturing	Core Course	3	0	2	4
2		3D Rigging and Animation	Core Course	3	0	2	4
3		3D Lighting and Rendering	Core Course	3	0	2	4
4		Game Development Process	Core Course	4	0	2	5
5		Camera, Photography and Cinematography	Skill Enhancement	2	0	0	2
6		Programming using Python	Allied Course	3	0	4	5
			TOTAL	**18**	**0**	**12**	**24**
			Total Credits	**Min Required: 24** **Semester Credits: 24**			

Course Title: 3D Modeling and Texturing

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

	Teaching Hours
Unit I: Introduction	**9 H**
Understanding the software interface. Exploring 3D space along X, Y, Z axis. Camera controls - Pan, Tilt and Zoom. Orthographic vs Perspective Views. Saving projects, creating asset directories, importing and exporting.	
Unit II: Modeling	**12 H**
Understanding 3D objects. NURBS vs Polygons. Vertices, Edges, Faces and Control Points. Translate, Rotate and Scale. Duplicating, parenting and grouping. Object geometry and sculpting tools - slice, bevel, extrude, etc.	
Unit III: Materials	**12 H**
Assigning materials to 3D objects. Understanding material attributes. Colour, transparency, reflectivity, specular highlights, smoothness, light emission, etc.	
Unit IV: Texturing	**12 H**
Texture types - static, dynamic, procedural. Importing and applying textures. Texture properties – size, orientation, scaling, tiling. Hyperviewer. UV unwrap.	

List of Experiments (Total:30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.

19. Have a 3D character grab another 3D object.

20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Understand and use the tools to work in 3D space.
2. Create and manipulate 3D objects.
3. Understand, apply and modify materials.
4. Create and assign textures to 3D objects.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Danan Thilakanathan	3D Modeling For Beginners	CreateSpace	2016	978-1530799626
William Vaughan	Digital Modeling	New Riders Pub	2011	978-0321700896
Ami Chopin	3D Art Essentials: The Fundamentals of 3D Modeling, Texturing, and Animation	Focal Press	2011	978-0240814711
Donna Smith	Texturing a 3D Character	CreateSpace	2017	978-1544818207

Course Title: 3D Rigging and Animation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: Introduction to 3D Animation		**9 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Introduction to Rigging		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Bipedal Rigging		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Bipedal Animation		**12 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total:30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735

Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: 3D Lighting and Rendering

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

	Teaching Hours
Unit I: Lighting in 3D Space	**9 H**
Understanding the software interface. Exploring 3D space along X, Y, Z axis. Camera controls - Pan, Tilt and Zoom. Orthographic vs Perspective Views. Saving projects, creating asset directories, importing and exporting.	
Unit II: Properties of Light and Shadow	**12 H**
Understanding 3D objects. NURBS vs Polygons. Vertices, Edges, Faces and Control Points. Translate, Rotate and Scale. Duplicating, parenting and grouping. Object geometry and sculpting tools - slice, bevel, extrude, etc.	
Unit III: Light Modifiers	**12 H**
Assigning materials to 3D objects. Understanding material attributes. Colour, transparency, reflectivity, specular highlights, smoothness, light emission, etc.	
Unit IV: Rendering 3D Scenes	**12 H**
Texture types - static, dynamic, procedural. Importing and applying textures. Texture properties – size, orientation, scaling, tiling. Hyperviewer. UV unwrap.	

List of Experiments (Total:30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.

15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Understand and use the tools to work in 3D space.
2. Create and manipulate 3D objects.
3. Understand, apply and modify materials.
4. Create and assign textures to 3D objects.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Danan Thilakanathan	3D Modeling For Beginners	CreateSpace	2016	978-1530799626
William Vaughan	Digital Modeling	New Riders Pub	2011	978-0321700896
Ami Chopin	3D Art Essentials: The Fundamentals of 3D Modeling, Texturing, and Animation	Focal Press	2011	978-0240814711
Donna Smith	Texturing a 3D Character	CreateSpace	2017	978-1544818207

Course Title: Game Development Process

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	2	5

		Teaching Hours
Unit I: Pipeline for Game Development		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Pre-Production for Game Development		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Production for Game Development		**15 H**

How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Post-Production for Game Development		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total:30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: After studying this course students will be able to:

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN

Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Camera, Photography and Cinematography

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

Course Contents/syllabus:

	Teaching Hours
Unit I: Components of Camera Systems	**6 H**
Exploring the look and feel for animation through concept art. Planning character design, layout design, illustration style, composition, staging, backgrounds. A study of indigenous design and painting, both contemporary and traditional to understand and analyze a variety of styles and visual language	
Unit II: Types of Lenses	**9 H**
Story, whether adapted or original, taking the story from a verbal or spatial medium like a book or graphic novel to a form suitable for making a film, i.e., script. What makes a good story? Character, plot and genre. Understanding of archetypes and a brief introduction to the hero's journey. Character Design & Model Sheets, Layouts & Scene Planning. Storyboard design. Acting for animation. Voice-over recording. Animatics and pre-visualization.	
Unit III: 5 Cs of Cinematography	**6 H**
Hand-drawn animation vs 2D animation vs 3D animation. Line-tests, keyframes & Timing (extreme poses, inbetweens and holds). Creating rhythms in animation. Action layering for limited animation and full animation. Drawing key frames, breakdowns, inbetweens, animation cycles. Clean-up and scanning frames. Adding to timeline (on ones, twos or threes).	
Unit IV: Use of Camera in Animation and Game Design	**9 H**
Work in Progress. Development of a film from Animatic to Edit with different scenes at different stages. Coming together of the various elements of the scene. Understanding the dynamics of camera moves and magnifications. Adding visual effects and compositing. Editing (linear vs non-linear). Voice, Music & Effects. Understanding the dynamics of sound design and use of sound as a key component of animation. Designing a sound-track for animation including music, foley, dialogue voice-overs and lip synch. Recording and mixing multiple tracks. Post-processing sound. Mixing of sound for final Edit. Screening and feedback.	

Course Learning Outcomes: On the successful completion of this course the student will...

1. Learn basics of design conceptualization.
2. Understand the stages of pre-production.

3. Understand the stages of production.
4. Understand the stages of post-production.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Richard William	The Animators Survival Kit	2nd Edition, Faber and Faber	2002	978-0865478978
Shamus Culhane	Animation From Script to Screen	St. Martin's Griffin	1990	978-0312050528
Mascelli Joseph V	The Five C's of Cinematography: Motion Pictures Filming Techniques	Silman-James Press	1998	978-1879505414
David Sonnensch	Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema	Michael Wiese Productions	2001	978-0941188265

Course Title: Programming using Python

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	4	0	5

		Teaching Hours
Unit I: Introduction to Python		**12 H**
Introduction to Python Programming Language: Programming Language, History and Origin of Python Language, Features of Python, Limitations, Major Applications of Python, Getting, Installing Python, Setting up Path and Environment Variables, Running Python, First Python Program, Python Interactive Help Feature, Python differences from other languages. Python Data Types & Input/Output: Keywords, Identifiers, Python Statement, Indentation, Documentation, Variables, Multiple Assignment, Understanding Data Type, Data Type Conversion, Python Input and Output Functions, Import command. Operators and Expressions: Operators in Python, Expressions, Precedence, Associativity of Operators, Non Associative Operators		
Unit II: Control Structures		**11 H**
Control Structures: Decision making statements, Python loops, Python control statements. Python Native Data Types: Numbers, Lists, Tuples, Sets, Dictionary, Functions & Methods of Dictionary, Strings (in detail with their methods and operations).		
Unit III: Functions and Modules		**12 H**

Python Functions: Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables. Python Modules: Module definition, Need of modules, Creating a module, Importing module, Path Searching of a Module, Module Reloading, Standard Modules, Python Packages.		
Unit IV: Exception Handling		**11 H**
Exception Handling: Exceptions, Built-in exceptions, Exception handling, User defined exceptions in Python.		

List of Experiments (Total:60 Hours)

1. Compute sum, subtraction, multiplication, division and exponent of given variables input by the user.
2. Compute area of following shapes: circle, rectangle, triangle, square, trapezoid and parallelogram.
3. Compute volume of following 3D shapes: cube, cylinder, cone and sphere.
4. Compute and print roots of quadratic equation ax2+bx+c=0, where the values of a, b, and c are input by the user.
5. Print numbers up to N which are not divisible by 3, 6, 9,, e.g., 1, 2, 4, 5, 7,….
6. Write a program to determine whether a triangle is isosceles or not?
7. Print multiplication table of a number input by the user.
8. Compute sum of natural numbers from one to n number.
9. Print Fibonacci series up to n numbers e.g. 0 1 1 2 3 5 8 13…..n
10. Compute factorial of a given number.
11. Count occurrence of a digit 5 in a given integer number input by the user.
12. Print Geometric and Harmonic means of a series input by the user.
13. Evaluate the Arithmetic expressions.
14. Print all possible combinations of 4, 5, and 6.
15. Determine prime numbers within a specific range.
16. Count number of persons of age above 60 and below 90.
17. Compute transpose of a matrix.
18. Perform following operations on two matrices.
    1) Addition 2) Subtraction 3) Multiplication
19. Count occurrence of vowels.
20. Count total number of vowels in a word.
21. Determine whether a string is palindrome or not.

22. Perform following operations on a list of numbers:
    1) Insert an element 2) delete an element 3) sort the list 4) delete entire list
23. Display word after Sorting in alphabetical order.
24. Perform sequential search on a list of given numbers.
25. Perform sequential search on ordered list of given numbers.
26. Maintain practical note book as per their serial numbers in library using Python dictionary.
27. Perform following operations on dictionary
    1) Insert 2) delete 3) change
28. Check whether a number is in a given range using functions.
29. Write a Python function that accepts a string and calculates number of upper case letters and lower case letters available in that string.
30. To find the Max of three numbers using functions.
31. Multiply all the numbers in a list using functions.
32. Solve the Fibonacci sequence using recursion.
33. Get the factorial of a non-negative integer using recursion.
34. Write a program to create a module of factorial in Python

Course Learning Outcomes: After studying this course students will be able to:

1. Explain environment, data types, operators used in Python.
2. Compare Python with other programming languages.
3. Outline the use of control structures and numerous native data types with their methods.
4. Design user defined functions, modules, files, and packages and exception handling methods.
5. Learn to handle exceptions in Python.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Programming in Python	Programming in Python	BPB	2017	978-9386551276
R. Nageswara Rao	Core Python Programming	Dreamtech Press	2021	978-9390457151
Martin C. Brown	Python, The complete Reference	Tata Mc. Graw Hill	2018	978-9387572942

A. Martelli, A. Ravenscroft, S. Holden	Python in a Nutshell	Shroff/O'Reilly	2017	978-9352135400

Course: BSc (Animation and Game Design)
Program Structure
Semester IV (2nd year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	T	PS	
1		3D Character Creation	Core Course	3	0	4	5
2		3D Game Design	Core Course	3	0	4	5
3		Visual Effects	Core Course	4	0	2	5
4		Video Editing Techniques	Core Course	2	0	2	3
5		Film Appreciation and Review	Skill Development	2	0	0	2
6		Intellectual Property Rights and Cyber Law	Allied Course	4	0	0	4
			TOTAL	**18**	**0**	**12**	**24**
			Total Credits	**Min Required: 24** **Semester Credits: 24**			

**Students will also go for minimum 4 weeks of industrial training during their summer break.*

Course Title: 3D Character Creation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	4	0	5

		Teaching Hours
Unit I: Understanding Character Appeal		**9 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Character Features and Costume		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Character Movement Rig		**12 H**

How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Character Facial Rig		**12 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 60 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: After studying this course students will be able to:

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: 3D Game Design

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	4	0	5

		Teaching Hours
Unit I: Introduction to 3D Game Level Design		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Introduction to 3D Game Asset Creation		**10 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Art Direction for 3D Games		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Lighting for 3D Games		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 60 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.

9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Visual Effects

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	2	0	5

		Teaching Hours
Unit I: Introduction to Visual Effects		**5 H**

Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Introduction to Compositing		**10 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Introduction to Camera Tracking		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Introduction to Motion Graphics		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.

3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Video Editing Techniques

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	2	0	3

		Teaching Hours
Unit I: Linear vs Non-Linear Editing		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Layer-based vs Node-based Workflows		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Cuts, Warps and Transitions		**10 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Syncing Audio and Video		**10 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.

6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Film Appreciation and Review

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Introduction to Film Theory		**10 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Understanding Media Criticism		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Components of Film Review		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Ethics of Entertainment Journalism		**15 H**

How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Intellectual Property Rights and Cyber Law

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Introduction to Intellectual Property Rights		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Introduction to Cyber Law		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Trademark and Copyright		**10 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool.		
Unit IV: Fair Use		**10 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: After studying this course students will be able to:

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.

3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course: BSc (Animation and Game Design)
Program Structure
Semester V (3rd year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	T	PS	
1		Specialization Course 1	Specialization Course	3	0	2	4
2		Specialization Course 2	Specialization Course	3	0	2	4
3		Specialization Course 3	Specialization Course	2	0	0	2
4		Sound Design for Visual Media	Core Course	4	0	0	4
5		Digital Asset Management	Core Course	2	0	0	2
6		Information Security	Allied Course	4	0	0	4
7		Major Project	Non-Teaching Credit Course	0	0	8	4
8		Industrial Training	Non-Teaching Credit Course	0	0	0	2
			TOTAL	**16**	**0**	**12**	**26**
			Total Credits	**Min Required: 26**			

				Semester Credits: 26

	Animation	**Game Design**	**Visual Effects**
Specialization Course 1	3D Animation Enhanced Techniques	Game Design Advanced Techniques	Visual Effects Enhanced Techniques
Specialization Course 2	Acting for Animation	Gameplay User Interface	Digital Compositing
Specialization Course 2	Case Studies of Animation Films	Case Studies of Video Games	Case Studies of Visual Effects Films

Course Title: 3D Animation Enhanced Techniques

Course Contents/syllabus:

L	**T**	**P/S**	**SW/FW**	**TOTAL CREDIT UNITS**
3	**0**	**2**	**0**	**4**

		Teaching Hours
Unit I: Advanced 3D Animation		**12 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Advanced Rigging		**9 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Advanced Bipedal Rigging		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Advanced Bipedal Animation		**12 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.

8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Game Design Advanced Techniques

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: Advanced Game Design		**12 H**

Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Advanced Game Asset Creation		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Advanced Level Design		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Advanced Game Lighting		**9 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.

3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Visual Effects Enhanced Techniques

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: Advanced Visual Effects		**12 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Advanced Compositing		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Advanced Camera Tracking		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Advanced Color Correction		**9 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.

6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.
11. Create blend shapes for an object.
12. Create a skeleton for 3D character.
13. Skin a 3D character using Paint Weights Tool.
14. Create IK/FK switch.
15. Create poses for a 3D character.
16. Animate the transition between poses.
17. Create a walk-cycle animation.
18. Create a jump animation.
19. Have a 3D character grab another 3D object.
20. Animate an active sequence using a 3D character.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Acting for Animation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: Theories of Acting		**12 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Exaggeration in Acting		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Voice-Over and Lip-Sync		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Non-Human Acting		**9 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798

David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Gameplay User Interface

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: User Interface and User Experience		**12 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Game Menu Design		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Heads-Up Display		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Player Assistance Elements		**9 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.
6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.

2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Digital Compositing

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	0	4

		Teaching Hours
Unit I: Multi-layer Rendering		**9 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Perspective Scaling and Distortion		**12 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Matching Light and Colour		**12 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Timeline Editing		**12 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

List of Experiments (Total: 30 Hours)

1. Animate the position of a 3D object.
2. Animate the rotation of a 3D object.
3. Animate the size of a 3D object.
4. Animate the shape of a 3D object.
5. Change the smoothness of animation using Graph Editor.

6. Change the timing of animation using Dope Sheet.
7. Create control surfaces for objects.
8. Select multiple attributes with single control.
9. Create connections between objects using constraints.
10. Add deformers to an object.

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: **Case Study of Animation Films**

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Breakdown of Animation Films		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Key Roles and Responsibilities		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Evaluating Performances		**10 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Profitability and Relevance over Time		**10 H**

How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Case Study of Video Games

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Breakdown of Video Games		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Key Roles and Responsibilities		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Evaluating Gameplay		**10 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Profitability and Relevance over Time		**10 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.

2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Case Study of Visual Effects Films

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Breakdown of Visual Effects		**5 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Key Roles and Responsibilities		**5 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Evaluating Techniques		**10 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Profitability and Relevance over Time		**10 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Sound Design for Visual Media

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Elements of Sound Design		**15 H**
Physics of audio, specifically how analog and digital audio differ. Understanding of "how" sound works students through the practical use of microphones – the first link in the chain of signal flow.		
Unit II: Dialogue and Foley Recording		**15 H**
Process of recording sounds at any time in any environment. Five Ws of portable recording as well as some basics in mastering their sounds.		
Unit III: Background Music		**15 H**
Concepts, theory, and basic software implementation methods and techniques essential to game audio. Understanding the fundamental difference of real-time, interactive audio considerations as compared to post audio is essential.		
Unit IV: Sound Editing and Mixing		**15 H**
Basic triggered audio messages and functions. Learn to create and attach their own audio assets to scripted components in running game project prototypes in order to get their sounds functional according to real-time properties.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of sound editing software for animation.
2. Sync the emission of sound with the movement of objects.
3. Create sound effects using props and microphone techniques.
4. Trigger sounds with player actions in video games.
5. Mix the dialogues, foley, soundtracks and background music into the soundstage.
6. Learn about the parameters of sound mastering and compression.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Robin Beauchamp	Designing Sound for Animation	Focal Press	2013	978-0240824987

Jean-Luc Sinclair	Principles of Game Audio and Sound Design	Focal Press	2020	978-1138738973
Vanessa Theme Ament	The Foley Grail: The Art of Performing Sound for Film, Games, and Animation	Focal Press	2009	978-0240811253
John Purcell	Dialogue Editing for Motion Pictures: A Guide to the Invisible Art	Routledge	2013	978-0415828178

Course Title: Digital Asset Management

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Asset Management Pipelines		**10 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Asset Integrity and Availability		**10 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Digital Asset Protection		**5 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Backup and Encryption		**5 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798

David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Information Security

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Introduction to Information Security		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Online Security Protocols		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Online vs Offline Storage		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Data Encryption and Hacking		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
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Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course: BSc (Animation and Game Design)
Program Structure
Semester VI (3rd year)

Sr. No	Course Code	Course Title	Course Type	Weekly Hours			Credit Units
				L	T	PS	
1		Specialization Course 4	Specialization Course	4	0	0	4
2		Specialization Course 5	Specialization Course	4	0	0	4
3		Entertainment Business Management	Core Course	4	0	0	4
4		Portfolio Preparation and Presentation	Core Course	2	0	0	2
5		Industrial Training*	Non-Teaching Credit Course	0	0	0	10
			TOTAL	**14**	**0**	**0**	**24**
			Total Credits	**Min Required: 24** **Semester Credits: 24**			

**Students will go for a minimum 16 weeks of certified industrial training and/or internship.*

	Animation	Game Design	Visual Effects
Specialization Course 4	Production Management for Animation	Project Management for Games	Technical Direction for Visual Effects
Specialization Course 5	Marketing and Distribution for Animation	Marketing and Distribution for Game Design	Marketing and Distribution for Visual Effects

Course Title: Production Management for Animation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	**0**	**0**	**0**	**4**

	Teaching Hours

Unit I: Managing Animation Projects		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Role of Animation Producer		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Budgeting for Animation		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Talent Acquisition and Management		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Project Management for Games

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Managing Video Game Projects		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Role of Game Developer		**15 H**

How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Budgeting for Games		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Talent Acquisition and Management		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Technical Direction for Visual Effects

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Managing Visual Effects Projects		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Role of Technical Director		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Budgeting for Visual Effects		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		

Unit IV: Talent Acquisition and Management		15 H
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Marketing and Distribution for Animation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Animation Marketing Techniques		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Channels for Distribution of Animation		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Pricing Strategies for Animation		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Generating buzz for Animation		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.

2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Marketing and Distribution for Game Design

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Video Game Marketing Techniques		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Channels for Distribution of Games		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Pricing Strategies for Games		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Generating buzz for Games		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Marketing and Distribution for Visual Effects

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Visual Effects Marketing Techniques		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Channels for Distribution of Visual Effects		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Pricing Strategies for Visual Effects		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Generating buzz for Visual Effects		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798

David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735
Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Entertainment Business Management

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
4	0	0	0	4

		Teaching Hours
Unit I: Introduction to Studio Management		**15 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Media Management Techniques		**15 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Team Hierarchies and Structures		**15 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Contracts, Permits and Waivers		**15 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Use the interface of 3D software for animation.
2. Animate the movement of 3D objects.
3. Create joints and constraints between objects.
4. Rig a functional skeleton onto a 3D character.
5. Animate the movement of a 3D character.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	3D Animation Essentials	Sybex	2012	978-1118147481
Tina O'Hailey	Rig it Right!	Focus Press	2013	978-0240820798
David Rodriguez	Animation Methods - Rigging Made Easy	CreateSpace	2013	978-1484127735

Isaac Kerlow	The Art of 3D Computer Animation and Effects	4th Edition, Wiley	2009	978-0470084908

Course Title: Portfolio Preparation and Presentation

Course Contents/syllabus:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

		Teaching Hours
Unit I: Introduction to Media Portfolios		**6 H**
Understanding the interface for 3D animation. How to work on Timeline. How to set Keyframes. How to work on Graph Editor. How to work on Dope Sheet. How to set Controls for objects and attributes.		
Unit II: Portfolio Breakdown and Analysis		**6 H**
How to make Connections, Constraints and Relationships. How to add Deformers. Different types of Joints. How to make Blend-shapes.		
Unit III: Portfolio Preparation Techniques		**9 H**
How to create joints, bone structure and skeleton for a character so that it can be rigged for animation. How to smooth out and correct problem areas with the paint weights tool. How to create new attributes, set driven keys and IK/FK handles.		
Unit IV: Portfolio Presentation and Distribution		**9 H**
How to pose a rigged character. How to show weight and balance. How to create different emotions. How to animate a walk cycle. How to animate a jump. How to animate the use of a prop.		

Course Learning Outcomes: On the successful completion of this course the student will...

1. Know the importance of having a portfolio.
2. Understand what makes a good media portfolio.
3. Create versions and iterations of portfolio for specific uses.
4. Learn to present your portfolio effectively.
5. Find the best avenues for distributing your portfolio.

Text / Reference Books:

AUTHOR	TITLE	Publisher	Year of publication	ISBN
Andy Beane	Preparing Your Portfolio	Sybex	2012	978-1118147481
Tina O'Hailey	So You Are A Media Professional?	Focus Press	2013	978-0240820798
David Rodriguez	Portfolio Presentation Techniques	CreateSpace	2013	978-1484127735
Isaac Kerlow	Motion-Graphics For Video Portfolios	4th Edition, Wiley	2009	978-0470084908