J C Bose University of Science and Technology, YMCA,

Faridabad, Haryana

Department of Computer Applications

Scheme and Syllabus

B.Sc. Animation and Multimedia

(Semester IV)

J. C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
B.Sc. (ANIMATION AND MULTIMEDIA)
Scheme of Studies/Examination
Semester- 4

Sr. No	Category	Course code	Course Title	Course Requirements (hrs)			Sessional Marks/End Term Marks		Total Marks	Credits
				L	P	Total	Sessional	End Term		
1	Discipline Specific-Major	BSC-AM-23-401	Character Development	3	-	3	25	75	100	3
2	Discipline Specific-Major	BSC-AM-23-402	C# Programming Language	3	-	3	25	75	100	3
3	Discipline Specific-Major	BSC-AM-23-403	Design Thinking	4	-	4	25	75	100	4
4	Discipline Specific-Minor	BSC-AM-23-404	Visual and Verbal Storytelling	4	-	4	25	75	100	4
5	Ability Enhancement courses	AEC-108-N1	Critical Thinking and Rhetorical Communication	2	-	2	25	75	100	2
6	Value Added Course	VAC-108-N1	Indian Knowledge System	2	-	2	25	75	100	2
7	Discipline Specific-Major	BSC-AM-23-405	2D Animation Lab	-	8	8	15	35	50	4
8	Discipline Specific Major Lab	BSC-AM-23-406	3D Character Development Lab	-	4	4	15	35	50	2
9	Discipline Specific Major Lab	BSC-AM-23-407	C# Programming Lab	-	4	4	15	35	50	2
			Total			**34**	**195**	**555**	**750**	**26**

SEMESTER -IV

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-401
SUBJECT NAME: CHARACTER DEVELOPMENT

No. of Credits: 3

L	**3**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Course objectives:

1. Understand the process of refining character designs through facial features, outfits, and color schemes.
2. Apply principles of character design to create 10 different silhouettes for their main character.
3. Analyze the effectiveness of different poses and facial expressions in conveying character personality and emotion.
4. Generate original character concepts based on shapes and silhouettes, refining them into

Unit-01
Designing Volumetric Characters from Shapes Assignment (Each student will design their main character from shapes and silhouettes by creating 10 different silhouettes, refining to 5 roughs, and then selecting the best of the 5 for a final large sketch.)
Unit-02
Refining Character Design Assignment (The student will take their finalized all main characters and begin the refining process by refining facial features, outfits, and color scheme. Output to PDF, including the face, the outfits, and the color schemes.)
Unit-03
Model Sheets and Turnarounds Assignment (The student will create a full model sheet for their main characters involving sketches of 10 action/movement poses. The student will also create a full sheet of facial expressions consisting of 10 different moods. Output to PDF, including the full model sheet of the character and another of the facial expressions.)
Unit-04
Character from storyboard scene assignment (The student will create a short script based on the synopsis created in the Character Concepts.)
Unit-05
Production Bible Assignment (The student will culminate all of the assignments completed during this semester. The student must take all of the created elements, place them into 1 document, and take any critique provided by the professor and update as needed.)

Course outcome: Students will be able to:

A. acquire a comprehensive understanding of character design principles and techniques.
B. apply learned techniques to create visually appealing and well-defined character designs.
C. analyze the effectiveness of different poses and expressions in conveying character personality and emotion.
D. evaluate their own work and the work of others based on established criteria and standards.

	Course Outcomes				
Course Objectives		A	B	C	D
	1	✓			
	2		✓		
	3			✓	
	4				✓
	5				

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-402
SUBJECT NAME: C# PROGRAMMING LANGUAGE

No. of Credits: 3

L	**3**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Course objectives:

1. To Understand the concepts of managed code, assemblies, and common type system in .NET.
2. To Apply the principles of 3-tier architecture to design applications.
3. To Analyze the structure and functionality of the CLR, IL, and JIT compiler in the .NET framework.
4. To Design and implement C# classes with appropriate inheritance hierarchies. Create database connectivity solutions using ADO.Net objects and techniques.

Unit-01
Introduction to .NET The origin of .NET, Basics of .Net Framework & its Key design goals, 3-tier architecture, managed code, assemblies, CLR, IL, JIT, .NET framework class library, common type system, common language specification, Inter-operatability among managed and Unmanaged code.
Unit-02
Introduction to C# Understanding C# Environment, Basics of C#,Literals, Variables and Data Types, Operators and Expressions, Decision Making and Branching, Looping and C# Methods.
Unit-03
C# Classes & Inheritance Classes, Arrays, String Handling, Structures & Enumerations, Inheritance, Method Hiding and Overloading, Abstract Classes, Interfaces, Events and Delegates, Managing Errors & Exceptions
Unit-04
Database Connectivity Architecture of ADO.Net, Comparison with ADO, ADO.Net Object Model, Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Connecting to Database, Accessing &Manipulating Data and Performing Data Updates.

Course outcome: Students will be able to:

A. Apply various fundamentals for problem solving using python.
B. Implement modular programming and differentiate the mutability of various data types.
C. Create object-oriented solutions by applying various concepts like polymorphism, inheritance, and package with python programming.
D. Implement multithreading and manage security in Linux operating system.

	Course Outcomes				
Course Objectives		A	B	C	D
	1	✓			
	2		✓		
	3			✓	
	4				✓
	5	✓			

Text Books/ Reference Books:

1. Starting Out with Python (2009) Pearson , Tonny Gaddis
2. Beginning PyhtonWrox Publication Peter Norton, Alex Samuel
3. Python Algorithms Apress, Magnus LietHetland,
4. Python Object Oriented Programming PACKT Press, Dusty Phillips
5. Python for Unix and Linux System Administration O'Relly, Noad Gift

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-403
SUBJECT NAME: DESIGN THINKING

No. of Credits: 4

L	**4**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Course objectives:

1. To Understand the significance and purpose of each stage in the design process.
2. To Apply knowledge of design stages to analyze real-world design challenges.
3. To Analyze different methods and approaches for idea generation and refinement in design.
4. To Generate innovative design concepts and solutions based on the principles learned in each stage.

Unit-01
Stages of thinking The Design Process: Stage 1 – Define, Stage 2 – Research, Stage 3 – Ideate, Stage 4 – Prototype, Stage 5 – Select, Stage 6 – Implement, Stage 7 – Learn
Unit-02
Research : Identifying drivers, Information gathering, Target groups Idea generation: Basic design directions, Themes of thinking, Inspiration and references, Brainstorming, Value, Inclusion, Sketching, Presenting ideas.
Unit-03
Refinement: Thinking in images, Thinking in signs, Appropriation, Humour, Personification, Visual metaphors, Modification, Thinking words, Words and language, Type ‘faces’, Thinking in shapes, Thinking in proportions, Thinking in colour.
Unit-04
Prototyping: Developing designs, ‘Types’ of prototype, Vocabulary.
Unit-05
Implementation: Format, Materials, Finishing, Media, Scale, Series/Continuity

Course outcome: Students will be able to:

A. acquire a comprehensive understanding of the stages of the design process and their significance.
B. apply design thinking principles to solve practical design problems.
C. analyze design problems and opportunities to determine appropriate strategies.
D. assess the effectiveness of design methodologies and techniques in achieving project objectives.

	Course Outcomes				
Course Objectives		A	B	C	D
	1	✓			
	2		✓		
	3			✓	
	4				✓
	5				

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-404
SUBJECT NAME: Visual and Verbal Storytelling

No. of Credits: 4

L	**4**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Course objectives:

1. Understand the relationship between visual and verbal storytelling components.
2. Apply techniques for creating compelling narratives and story structures.
3. Analyze techniques for integrating visual and verbal storytelling elements effectively.
4. Generate story arcs, plot developments, and dialogue that contribute to effective storytelling.

Unit-01
Introduction to Visual and Verbal Storytelling in Animation and Multimedia. • Definition and significance of visual and verbal storytelling in animation and multimedia design. • Understanding the relationship between visual and verbal elements in storytelling.
Unit-02
Story Development and Narrative Structure. • Techniques for creating compelling narratives and story structures. • Developing story arcs, plot development, and pacing.
Unit-03
Dialogue Writing and Scripting. • Principles of effective dialogue writing in animation and multimedia projects. • Developing dialogue that enhances character development and storytelling.
Unit-04
Visual and Verbal Integration in Animation and Multimedia. • Exploring techniques for integrating visual and verbal storytelling elements effectively. • Creating seamless transitions between visual and verbal narratives.
Unit-05
Storytelling in Different Animation and Multimedia Genres. • Exploring storytelling techniques in various animation and multimedia genres (e.g., 2D animation, 3D animation, interactive media). • Adapting visual and verbal storytelling techniques to specific animation and multimedia disciplines.

Course outcome: Students will be able to:

A. Acquire an understanding of visual and verbal storytelling concepts in animation and multimedia.
B. Recall the definition and significance of visual and verbal elements in storytelling.
C. Apply techniques for developing story arcs, plot development, and dialogue writing in animation and multimedia projects.
D. Analyze narrative structures and pacing in animation and multimedia storytelling.
E. Develop innovative approaches to storytelling in various animation and multimedia genres.

	CourseOutcomes				
Course Objectives		A	B	C	D
	1	✓			
	2		✓		
	3			✓	
	4				✓
	5				

Text Books/ Reference Books:

- THE ART OF STORYTELLING: EASY STEPS TO PRESENTING AN UNFORGETTABLE STORY
- THE STORY FACTOR: INSPIRATION, INFLUENCE, AND PERSUASION THROUGH THE ART OF STORYTELLING
- THE LEADER'S GUIDE TO STORYTELLING: MASTERING THE ART AND DISCIPLINE OF BUSINESS NARRATIVE (J-B US NON-FRANCHISE LEADERSHIP)

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER

CODE: AEC-108-N1

SUBJECT NAME: Critical Thinking and Rhetorical Communication

No. of Credits: 2

L	**2**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Note: The examiner will be required to set seven questions in all having two parts. Part I will have Question Number 1 consisting of a total of 10 parts (short-answer type questions) covering the entire syllabus and will carry 15 marks. In Part II, there will be six questions. The examiner will set one and a half questions from each Unit of the syllabus and each question will carry 15 marks. Question Number 1 will be compulsory. In addition to the compulsory question, A student will have to attempt four more questions from Part II.

Syllabus:

Unit 1: Introduction to Critical Thinking and Rhetoric

Definition and types: Analysis, Communication, inference, Observation; Problem-Solving; Inductive and Deductive Reasoning; Edward de Bono's Thinking Hats; The Rhetorical Situation: Purpose; Audience; Topic and Context; Rhetorical strategies: compare; contrast; classify; describe; Rhetorical devices: alliteration and amplification.

Unit II: Content Analysis and Articulation

Comprehension of core ideas of an article; Identify credible sources; Evaluate and respond to arguments; Assess alternative viewpoints; Test hypotheses against relevant criteria; analyze information and form judgments; **CRAAP test**, these queslions focus on thc currency, relevance, authority, accuracy and purpose of a source of information; bias and eliminating bias, evidence-based arguments, considering alternatives views, popular media and information literacy.

Unit III: interview Skills

STAR method: Situation, Task, Action and Result; mock-interview exercises.

Unit IV: Conflict Resolution and Group Discussion

conflict; 3 P's of conflict resolution: Problem, People and Process; strategies to resolve conflict: avoid; compromise; accommodate; compete, collaborate; GD exercises with topical issues and chronic problems of regional, national and international importance; including leadership and team-building skills.

Course Outcome:

1. Students will be familiarized with the concept and significance of critical thinking.
2. Students demonstrate critical thinking skills including comprehension analysis and interpretation of information in communication process.
3. Students are able to articulate content for clear and persuasive communication
4. Students can apply conflict-resolution and problem-solving approaches towards building and managing teams for better organizational communication.

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: VAC-108-N1
SUBJECT NAME: Indian Knowledge System

No. of Credits: 2

L	**2**		**Sessional**	**25**
P	**0**		**Theory Exam**	**75**
			Total	**100**

Course Objectives:

1. To provide an overview of different knowledge systems originated in India.
2. To introduce in the students a comprehensive understanding of Indian ethics and values.

NOTE: Question paper will have two parts. Part-1 will be compulsory and have 10 questions of equal marks covering the entire syllabus. Any four questions have to be attempted out of six from Part-2.

Course Objectives:

1. To provide an overview of different knowledge systems originated in India.
2. To introduce in the students a comprehensive understanding of Indian ethics and values.

UNIT-I: Introduction and foundational concepts of IKS (4 Hrs)

Overview of various streams of knowledge in India and classification of ancient Indian texts; Various philosophical systems of India and fundamental principles inlaid in them

UNIT-II: Psychology from Indian perspective, Yoga and Indian Linguistics (4 Hrs)
Introduction to Ashtanga Yoga; Rasa Siddhanta of Natyasastra(theory of emotions), Panini's contribution to linguistics; Contributions of the Vakyasastra and Pramanasastra to linguistics

UNIT-III: Indian Mathematics and Astronomy (8 Hrs)
An overview of Indian mathematics, Development of arithmetic geometry and Trigonometry; Introduction to spherical geometry and calculus in India.
Vedic system of arithmetic computation, Vedic sutra for arithmetic computation.
An introduction to Indian Astronomy, Pre and Post Siddhantic period

UNIT-IV: Medicinal traditions in India (3 Hrs)
An Introduction to Ayurveda; Distinct features of Ayurveda, as compared to Alopathy; Excerpts from Sutrasthana

UNIT-V: Indian Architecture and Planning (3 Hrs)

Traditional measurement system used in Vastusastra, Prescriptions for residential Vastu, City planning as per Vastusastra

UNIT-VI: Economics, Management and Governance (4 Hrs)

An overview of Indian economic thought- Arthasastra and Nitisastra, Leadership and Motivation, Planning and Organizing, Financial Management etc.

SUGGESTED BOOKS:

1. Introduction to Indian Knowledge System, B. Mahadevan, V. R. Bhat, Nagendra Pavana R. N., PHI. 2022
2. Yoga System of Patanjali, J. H. Woods, Bharatiya Kala Prakashan 2009
3. Indian Philosophy Vol I and II, S. Radhakrishnan, Oxford University Press. 2009
4. Mayamatam Indian Treatise on Housing, Architecture and Iconography (2 volumes), Bruno Daegens, Indira Gandhi National centre for Arts. 2007
5. Vedanta and Management: Relevance of Vedantic Concepts in Modern Management Practices, N. V. Dave, Deep & Deep. 2002
6. Tantrasa graha with detailed Mathematical Explanatory Notes, K. Ramasubramanian, M. S. Sriram, Hindustan Book Agency. 2011
7. Karanapadhati of Putumana Somayaji, Venkateswara Pai, Ramasubramanian, M. S. Sriram and M.D. Srinivas, Hindustan Book Agency 2018
8. New Delhi 2002
9. The Nigha Motilal Banarsidass Publishers 2015
10. ga Literature, Archak K.B. Kaveri Books, New Delhi, 2012
11. Textbook of Ayurveda: Volume 1 - Fundamental Principles of Ayurveda, Vasant Lad, Ayurvedic Press; UK ed. Edition 2002
12. Sanskrit Academy, Hyderabad. 2010
13. Vedic Mathematics, Jagadguru Swami Sri Bharati Krsna Tirathji Maharaj, Motilal Banarsidass Publishers, Delhi 1965
14. Lilavati Bhaskaracarya: A Treatise of Mathematics of Vedic Tradition, K S Patwardhan, S A Naimpally and Shyam Lal Singh, Motilal Banarsidass Publishers Pvt Ltd, Delhi 2006

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-405
SUBJECT NAME: 2D Animation Lab

No. of Credits: 4

L	**0**		**Internal Practical**	**15**
P	**8**		**External Practical**	**35**
			Total	**50**

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	**Group A**
1.	Create Writing/ Drawing with hands/ pen animation
2.	Walk cycle with background panning
3.	Lip Sync and facial expression animation
4.	Sync animation clip with sound
5.	Create Mood walk cycle
6.	Create Jump with anticipation
7.	Create character action sequence, Create water splash animation
8.	Create magic sequence with effects.
	Mini-Projects/Case Study
9.	Create Short movie in 2D animation.

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER

CODE: BSC-AM-23-406

SUBJECT NAME: 3D Character Development Lab

No. of Credits: 2

L	**0**		**Internal Practical**	**15**
P	**4**		**External Practical**	**35**
			Total	**50**

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	**Group A**
1.	Basic layout of character as per model sheet.
2.	Blocking of character ,
3.	Low poly complete structure of character,
4.	Detailing low poly model as per age feature and body structure type.
5.	Converting low poly to high poly model,
6.	UV unwrapping of character.
7.	Create turntable of character.
8.	Character model turnaround.
	Mini-Projects/Case Study
9.	Create character for movies and games

B.SC. (ANIMATION AND MULTIMEDIA) 4th SEMESTER
CODE: BSC-AM-23-407
SUBJECT NAME: C# Programming Lab

No. of Credits: 2

L	**0**		**Internal Practical**	**15**
P	**4**		**External Practical**	**35**
			Total	**50**

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	**Group A**
1.	Accept a character from console and check the case of the character.
2.	Write a program to accept any character from keyboard and display whether it is vowel or not.
3.	Write a program to implement a calculator with memory and recall operations.
4.	Write a c# program to print fibonacci series without using recursion and using recursion.
5.	Write a program to check Armstrong number.
6.	Write a c# program to check palindrome number.
7.	Write a program to Swap two numbers without using third variable.
8.	Write a program to Reverse a Number.
9.	Write a c# program to check palindrome number.
10.	Write a c# program to convert number in characters.
11.	Develop a form in C# to pick a date from Calendar control and display the day, month, and year details in separate text boxes.
12.	Develop a C# application to perform timer based quiz of 10 questions.
13.	Develop a database application to store the details of students using ADO.NET
14.	Develop a database application using ADO.NET to insert, modify, update and delete operations.