



**J C Bose University of Science and Technology, YMCA,
Faridabad, Haryana**

Department of Computer Applications

Scheme and Syllabus

B.Sc. Animation and Multimedia

(Semester III)

w.e.f(2024-25)

The Scheme & Syllabus approved in 7th meeting of BOS for UG courses held on 22.4.2024

J. C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
B.Sc. (ANIMATION AND MULTIMEDIA)
Scheme of Studies/Examination
Semester- 3

Sr. No	Category	Course code	Course Title	Course Requirements (hrs)			Sessional Marks/End Term Marks		Total Marks	Credits
				L	P	Total	Sessional	End Term Marks		
1	Discipline Specific-Major	BSC-AM-23-301	Concept Designing	3	-	3	25	75	100	3
2	Discipline Specific-Major	BSC-AM-23-302	Java Programming	3	-	3	25	75	100	3
3	Multidisciplinary	BSC-AM-23-303	Psychology for Animation	3	-	3	25	75	100	3
4	Ability Enhancement courses	AEC-102-N1	Communication, Mediation and Resolution (CMR)	2		2	25	75	100	2
5	Value Added Course	VAC-102-N1	Environment Science -II	2	-	2	25	75	100	2
6	Discipline Specific-Minor	BSC-AM-23-304	Traditional Animation –II Lab	-	8	8	15	35	50	4
7	Discipline Specific Major Lab	BSC-AM-23-306	3D Concept Designing Lab	-	2	2	15	35	50	1
8	Discipline Specific Major Lab	BSC-AM-23-307	Java Programming Lab	-	2	2	15	35	50	1
9	Skill Enhancement Courses	BSC-AM-23-305	Digital Audio & Video Editing Lab	-	6	6	15	35	50	3
			Total			31	185	515	700	22

SEMESTER -III
SYLLABUS

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-301
SUBJECT NAME: CONCEPT DESIGNING

No. of Credits: 3

L	3		Sessional	25
P	0		Theory Exam	75
			Total	100

Course objectives:

1. To Understand the basic principles of line type, weight, and volume construction.
2. To Apply knowledge of human anatomy to create accurate representations of body parts.
3. To Analyze different types of perspective and their applications in visual representation.
4. To Evaluate the effectiveness of different color schemes in conveying mood and tone.

Unit-01
Introduction to Concept designing, Visual Design, and conceptualization, Visual Hierarchy, Line type, Line Weight
Unit-02
Volume Construction, human and animal anatomy, Study of human part face, hands, foot, torso, nose, lips.
Unit-03
Balance and perspective applied to figures, study dynamic poses of figures, figures in action and in movement.
Unit-04
Introduction to Perspective Drawing (Introduction to Perspective - Different types of Perspective - Different types of Eye Levels) .
Unit-05
Color scheme; monochromatic, analogous, complementary, split complementary, triadic and rectangle, (Or tetradic).

Course outcome: Students will be able to:

- A. acquire a foundational understanding of concept designing and visual principles.
- B. apply principles of human anatomy to accurately depict body parts in artwork.
- C. analyze different types of perspective and their impact on visual representation.
- D. Students will evaluate the effectiveness of their artwork in conveying intended messages or emotions.

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

Reference Books:

1. Baron, R.A. (1996). Psychology. 3ed. New Delhi: Prentice Hall.
2. Lahey, B. B. (1998). Psychology: An Introduction. New Delhi: Tata Mc Graw Hill.
3. Feldman, R. S. (2002). Understanding Psychology. New Delhi: Tata Mc Graw Hill.
4. Bootzin, R. R., Bower, G. H., Crocker, J., & Hall, E. (1991). Psychology Today. London: Mc Graw Hill.NCERT (2002).
5. Introduction to Psychology- Part-I. New Delhi: NCERT.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-302
SUBJECT NAME: Java Programming

No. of Credits: 3

L	3		Sessional	25
P	0		Theory Exam	75
			Total	100

Course objectives:

1. To Understand Java language syntax, basic features, and concepts. Interpret the architecture of Java Virtual Machine (JVM) and its functioning.
2. To Apply knowledge of primitive data types, variables, operators, expressions, and arrays in Java programming.
3. To Analyze the concepts of classes, inheritance, polymorphism, and containership in Java.
4. To Create multithreaded applications in Java, understanding thread lifecycle, synchronization, and prioritization

Unit-01
Java Language Basics Introduction to Java, Basic Features, Java Virtual Machine Architecture and Concepts, Primitive Data Type and Variables, Java Operators, Expressions, Statements and Arrays.
Unit-02
Classes, Inheritance and Polymorphism Classes, objects; array of objects; objects as function arguments, scope resolution operator, static data members, inheritances, types of inheritance, containership, constructors and their types, polymorphism, abstract class, interface and packages.
Unit-03
Exceptions and Multithreading Exception handling: exception handling in JAVA 'triesand catch, throwand catch, throws and catch blocks', multiple throw and catch blocks, throwing objects, exception classes, user defined exception. Multithreading: Concept of process and thread, life cycle of a thread, user defined thread creation through class and through interface, deciding priority in threads, synchronization in threads: producer-consumer problem.
Unit-04
I/O in JAVA I/O Basics, Type of Streams and Stream Classes, The Predefined Streams, reading from and Writing to Console, Reading and Writing Files, Object Serialization.

Course outcome: Students will be able to:

- A. acquire a comprehensive understanding of Java language basics, including syntax and features.
- B. apply Java concepts such as variables, operators, and arrays to solve programming problems.
- C. analyze the relationships between classes, inheritance, and polymorphism in Java programming.
- D. evaluate the efficiency and effectiveness of I/O operations in Java, including reading from/writing to files and object serialization.

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

Reference Books:

1. Cay S. Horstmann, Core Java, Volume 1, Fundamentals, Oracle Press.
2. E Balagurusamy: Programming in Java.
3. Herbert Schildt: The Complete Reference JAVA, TMH Publication.
4. Ivor Horton, Beginning JAVA, WROX Public.
5. Stephen Potts: JAVA 2 UNLEASHED, Tech Media Publications.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-303
SUBJECT NAME: Psychology for Animation

No. of Credits: 3

L	3		Sessional	25
P	0		Theory Exam	75
			Total	100

Course objectives:

1. Explain the principles of perceptual organization. Understand the processes involved in memory and forgetting.
2. Apply knowledge of perception to analyze depth perception. Apply understanding of memory processes to discuss proactive and retroactive interference.
3. Analyze the relationship between heredity and behavior. Examine the effects of environment on behavior.
4. Design experiments to study memory processes and factors influencing forgetting.

Unit-01

Perception: Definition, goals and scope of psychology; Approaches: biological, psychodynamic, behaviouristic, and cognitive, Perception, Factors affecting the Perception, Principles of Perceptual Organisation, Constancies in Perception - Size, Shape, Form, Space, Movement etc., Depth Perception, Psychophysics, Life-span Changes in Perception, Extra Sensory Perception (ESP), Illusions, Plasticity of Perception

Unit-02

Memory and Forgetting: Definition of memory; Processes involved in memory; Methods of measuring retention; Types of memory: sensory memory, short-term memory, and long-term memory, Process of forgetting; Determinants or causes of forgetting; Interference: proactive and retroactive interference, Ziegarnik effect.

Unit-03

Behavior: (1) Biological Bases of Behavior (Heredity): Human Evolution, Behavior Genetics, Phenotype, Genotype, Studies on the Effect of Hormones on Behavior, Genetics and Behavior, (2) Social cultural Bases of Behaviour (Environment): Environment and Behavior, Natural Internal Environment (physical or maternal environment) and Behavior, Man-made Environment (subjective environment), How these two affect behavior? Heredity Vs Environment.

Unit-04

Cognition: Cognitive Approach: Basic Concept, Assumptions, and Major Contributors, Social Cognition: Basic Concept, Social Cognitive Theory, Culture and Social Cognition, Perceiving Self, Self Concept, Self Esteem

Unit-05

Gestalt: Gestalt theory of perception: figure and ground, Laws of perceptual organization.

Course outcome: Students will be able to:

- A. Acquire an understanding of the definition, goals, and scope of psychology. Understand the principles underlying perceptual organization.
- B. Apply principles of perception to analyze real-world situations. Apply knowledge of memory processes to improve learning strategies.
- C. Analyze the interaction between heredity and environment in shaping behavior.
- D. Evaluate theories of perception and their practical implications. Evaluate the relative contributions of heredity and environment to behavior.

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

Reference Books:

1. Baron, R.A. (1996). Psychology. 3ed. New Delhi: Prentice Hall.
2. Lahey, B. B. (1998). Psychology: An Introduction. New Delhi: Tata Mc Graw Hill.
3. Feldman, R. S. (2002). Understanding Psychology. New Delhi: Tata Mc Graw Hill.
4. Bootzin, R. R., Bower, G. H., Crocker, J., & Hall, E. (1991). Psychology Today. London: Mc Graw Hill.NCERT (2002).
5. Introduction to Psychology- Part-I. New Delhi: NCERT.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: AEC-102-N1
SUBJECT NAME: Communication, Mediation and Resolution (CMR)

No. of Credits: 2

L	2		Sessional	25
P	0		Theory Exam	75
			Total	100

Course objectives:

CO 1: To familiarize the students with the process and barriers of communication.

CO 2: To enable the students develop critical thinking and identify logical fallacies.

CO 3: To help students in recognising factors and applying strategies in conflict resolution.

CO 4: To inspire students in appreciating the role of mediation and find creative solutions.

Unit-01
Quality of Content: Comprehension of core idea Real life examples Data generation Reasoning Vision /Goal Orientation Driving towards issue resolution Intelligent use of others' content
Unit-02
Personality Attitude Leadership Influencing ability Rapport building Participation Team, Confidence Motivation Activeness Energy Sense of humour
Unit-03
Communication Articulation Fluency Listening Body language Eye Contact
Unit-04
Types Of G.D Factual Topics Controversial Topics Abstract Topics
Unit-05
Interview Skills Common Interview Questions What Employers Want Attitude and Effort Body Language Research The Mock Interview Phone Interviews Behavioral Interviews Closing the Interview Thank You Notes

Course outcome:

CO I: The students will be familiarized with the process and barriers of communication.

CO II: The students will be enabled to develop critical thinking and identify logical fallacies.

CO III: The students will be able to recognise factors and apply strategies in conflict resolution.

CO IV: The students will be able to appreciate the role of mediation and find creative solutions.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER

CODE: VAC-102-N1

SUBJECT NAME: Environmental Science -II

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.

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

CO1: Understand about different types of pollution, their sources and their adverse impacts.

CO2: Develop understanding on the climate change concept, climate change adaptation and mitigation.

CO3: Understand broad aspects of environmental management systems and various methods followed for assessment of environmental quality and associated risks.

CO4: Learn about the major environmental conventions/protocols adopted at national and international level to protect and conserve environment.

Unit I: Environment Pollution and Health (6 hrs)

Understanding pollution: Production processes and generation of wastes; Assimilative capacity of the environment; Definition of pollution; Point sources and non-point sources of pollution.

A) Air pollution: Sources of air pollution; Primary and secondary pollutants; Criteria pollutants- carbon monoxide, lead, nitrogen oxides, ground-level ozone, particulate matter, and sulphur dioxide; Other important air pollutants- Volatile Organic compounds (VOCs), Peroxyacetyl Nitrate (PAN), Polycyclic aromatic hydrocarbons (PAHs) and Persistent organic pollutants (POPs); Indoor air pollution; Adverse health impacts of air pollutants; National Ambient Air Quality Standards.

B) Water pollution: Sources of water pollution; River, lake, and marine pollution, groundwater pollution; water quality. Water quality parameters and standards; adverse health impacts of water pollution on human and aquatic life.

C) Soil pollution and solid waste: Soil pollutants and their sources; Solid and hazardous waste; Impact on human health.

D) Noise pollution: Definition of noise; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; adverse impacts of noise on human health.

E) Thermal and Radioactive pollution: Sources and impact on human health and ecosystems.

Unit II: Climate Change: Impacts, Adaptation and Mitigation (6 hrs)

Understanding climate change: Natural variations in climate; Structure of atmosphere; Anthropogenic climate change from greenhouse gas emissions— past, present and future; Projections of global climate change with special reference to temperature, rainfall, climate variability and extreme events; Importance of 1.5 °C and 2.0 °C limits to global warming; Climate change projections for the Indian sub-continent.

Impacts, vulnerability and adaptation to climate change: Observed impacts of climate change on ocean and land systems; Sea level rise, changes in marine and coastal ecosystems; Impacts on forests and natural ecosystems; Impacts on animal species, agriculture, health, urban infrastructure; the concept of vulnerability and its assessment; Adaptation vs. resilience; Climate-resilient development; Indigenous knowledge for adaptation to climate change. Mitigation of climate change: Synergies between adaptation and mitigation measures; Green House Gas (GHG) reduction vs. sink enhancement; Concept

of carbon intensity, energy intensity, and carbon neutrality; Energy efficiency measures; Renewable energy sources; Carbon capture and storage, National climate action plan and Intended Nationally Determined Contributions (INDCs); Climate justice.

Unit III: Environmental Management (6 hrs)

Introduction to environmental laws and regulation: Constitutional provisions- Article 48A, Article 51A (g) and other derived environmental rights.

Environmental legislations in India: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air (Prevention and Control of Pollution) Act, 1981; The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002; The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Noise Pollution (Regulation and Control) Rules, 2000; Industry-specific environmental standards; Waste management rules.

Environmental management system: ISO 14001, Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis, Environmental audit and impact assessment; Environmental risk assessment, Pollution control and management; Waste Management- Concept of 3R (Reduce, Recycle and Reuse) and sustainability; Ecolabeling /Eco mark scheme.

Unit IV: Environmental Treaties and Legislation (6 hrs)

An overview of the following national and international cooperation, agreements, conventions, protocols - adoption, signature, ratification and entry into force; binding and nonbinding measures; Conference of the Parties (COP):

- A) Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer and the Kigali Amendment; Status phase-out of production and consumption of Ozone Depleting Substances by India.
- B) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; Minamata Convention on Mercury.
- C) United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Paris Agreement; India's status as a party to major conventions.
- D) National Green Tribunal; Some landmark Supreme Court judgements.
- E) Major International organisations and initiatives: United Nations Environment Programme (UNEP), International Union for Conservation of Nature (IUCN), World Commission on Environment and Development (WCED), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Panel on Climate Change (IPCC), and Man and the Biosphere (MAB) programme.

Unit V: Case studies/ Field Work (6 hrs)

The students are expected to be engaged in some of the following or similar identified activities:

- a) Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report.
- b) Discussion on one national and one international case study related to the environment and sustainable development.
- c) Campus environmental management activities such as solid waste disposal, water management and sanitation and sewage treatment plant

Suggested Readings:

1. Adenle A., Azadi H., Arbiol J. (2015). Global assessment of technological innovation for climate change adaptation and mitigation in developing world, *Journal of Environmental Management*, 161 (15): 261-275.
2. Ahluwalia, V. K. (2015). *Environmental Pollution, and Health*. The Energy and Resources Institute (TERI).
3. Barnett, J. & S. O'Neill (2010). Maladaptation. *Global Environmental Change—Human and Policy Dimensions* 20: 211–213.
4. Barrow, C. J. (1999). *Environmental management: Principles and practice*. Routledge.
5. Berrang-Ford, L., J.D. Ford & J. Paterson (2011). Are we adapting to climate change? *Global Environmental Change—Human and Policy Dimensions* 21: 25-33.

6. Bohra, Saroj, Judicial Intervention and Evolution of Environmental Principles and Doctrines (January 7, 2019). Available at SSRN: <https://ssrn.com/abstract=3311406> or <http://dx.doi.org/10.2139/ssrn.3311406>
7. Central Pollution Control Board Web page for various pollution standards. <https://cpcb.nic.in/standards/>
8. India Code – Digital repository of all Central and State Acts: <https://www.indiacode.nic.in/>
9. Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education.
10. Jørgensen, Sven Marques, Erik João Carlos and Nielsen, Søren Nors (2016) Integrated Environmental Management, A transdisciplinary Approach. CRC Press.
11. Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press.
12. Kaushik, A., & Kaushik, C. P. (2006). Perspectives in environmental studies. New Age International.
13. Masters, G. M., & Ela, W. P. (2008). *Introduction to environmental engineering and science* (No. 60457). Englewood Cliffs, NJ: Prentice Hall.
14. Miller, G. T., & Spoolman, S. (2015) Environmental Science. Cengage Learning.
15. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. <https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf>
16. Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge.
17. Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press.
18. Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press.
19. Tiefenbacher, J (ed.) (2022), Environmental Management - Pollution, Habitat, Ecology, and Sustainability, Intech Open, London. 10.5772/
20. UNEP (2007) Multilateral Environmental Agreement Negotiator's Handbook, University of Joensuu, ISBN 978-952-458-992-5
21. www.ipcc.org; <https://www.ipcc.ch/report/sixth-assessment-report-cycle>

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-304
SUBJECT NAME: TRADITIONAL ANIMATION –II 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.	Bouncing ball animation
2.	Pendulum animation
3.	Body mechanics - Walk
4.	Body mechanics- run
5.	Body mechanics- jump cycle
6.	Leaf animation
7.	Background panning
8.	Pin ball games in Traditional animation
	Mini-Projects/Case Study
9.	Create a short animation clip in traditional animation

B.SC. (ANIMATION AND MULTIMEDIA) 3RD SEMESTER
CODE: BSC-AM-23-306
SUBJECT NAME: 3D CONCEPT DESIGNING LAB

No. of Credits: 1

L	0		Internal Practical	15
P	2		External Practical	35
			Total	50

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	Group A
1.	Introduction to 3D software and interfaces – polygon model and nurbs model
2.	3D modeling, tools and techniques.
3.	Car Modeling
4.	Truck modeling
5.	Props modeling
6.	Unwrapping
7.	Material, shaders and Texturing
8.	Basic Lighting
	Mini-Projects/Case Study
9.	Create 3D scene.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-307
SUBJECT NAME: JAVA PROGRAMMING LAB

No. of Credits: 1

L	0		Internal Practical	15
P	2		External Practical	35
			Total	50

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	Group A
1.	Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.
2.	(i) Write a Java program to develop an applet that displays a simple message. (ii) Develop an Applet that receives an integer in one text field & compute its factorial value & returns it in another text field when the button "Compute" is clicked
3.	Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers(Use String Tokenizer class of java.util)
4.	Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.
5.	Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
6.	Write a java program that connects to a database using JDBC and does add, deletes, modify and retrieve operations.
7.	Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
8.	Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
9.	Write a Java program that displays the number of characters, lines and words in a text file.
10.	Write a Java program to make frequency count of words in a given text.

B.SC. (ANIMATION AND MULTIMEDIA) 3rd SEMESTER
CODE: BSC-AM-23-305
SUBJECT NAME: DIGITAL AUDIO & VIDEO EDITING LAB

No. of Credits: 3

L	0		Internal Practical	15
P	6		External Practical	35
			Total	50

List of Lab Experiments/Assignments (Implementation of each problem statement is mandatory)	
Sr. No.	Group A
1.	Introduction to Audio Editing Tool and interface.
2.	Importing audio file, the Main editing Screen, The Data Window and its Basics, Standard Toolbar, Common Edit Operations.
3.	Editing, Sound Formats, Recording, Applying sound processing functions, Edit, Process, Effects and Tools menu.
4.	To Create a Audio (Story) with appropriate background music and sound effect.
5.	Merge to different types of audio tracks.
6.	Digital Video Post-Production Tool interface. Workspace, timeline, effects control window, properties of the video.
7.	Basics of Post Production Concepts-Editing, Mixing, Resizing video, editing tools, transitions effects.
8.	Adding video effects, sound, Title making, making video footage into final video. Adobe Premiere video post- production.
	Mini-Projects/Case Study
9.	Create teaser/documentary Movie.

