

**Maulana Abul Kalam Azad University of Technology, West Bengal**

*(Formerly West Bengal University of Technology)*

**Syllabus for B. Sc. In Gaming**

**(Effective for Academic Session 2019-2020)**

**SEMESTER-III**

**Paper: 3D Animation**

**Code: BGD – 301**

**Contacts Hours / Week: 3L**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	Working with 3D Animation. Fundamentals of movement and timing, Apply, manipulate and combine media to create advanced 3D animated performances, Animation Cycles and Body Mechanics, 3D Naturalistic Character Animation. Walk style, Run, Jump, Action.
Unit 2	Indian animation development, Asian animation development, Western style of animation, Drawing in Motion, Advanced Character Rigging, Advanced Animation Techniques, Advanced Character Animation
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. <a href="https://www.youtube.com/watch?v=m9N_sIBRWvY">https://www.youtube.com/watch?v=m9N_sIBRWvY</a></li><li>2. 3D Animation for the Raw Beginner Using Maya (Chapman &amp; Hall/CRC Computer Graphics, Geometric Modeling, and Animation by Roger King</li><li>3. <a href="https://www.youtube.com/watch?v=H4AuZzRLves">https://www.youtube.com/watch?v=H4AuZzRLves</a></li><li>4. <a href="https://www.lynda.com/3D-Animation-training-tutorials/1-0.html">https://www.lynda.com/3D-Animation-training-tutorials/1-0.html</a></li><li>5. <a href="https://khannabooks.com/index.php?route=product/product&amp;product_id=383">https://khannabooks.com/index.php?route=product/product&amp;product_id=383</a></li></ol>	

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**Syllabus for B. Sc. In Gaming**

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**Paper: Game Design and Physics in Game Design**

**Code: BGD – 302**

**Contacts Hours / Week: 3L**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	Game Design wrap-up, Intermediate Game Production Topics, Useful code libraries, Data Structures Global Illumination. 2D Game Jam
Unit 2	Physics Programming , Multiplayer/Network Programming Overview, Tools Programming Overview More on 3D level texture & lights
<b>Suggested Readings:</b>	
<ol style="list-style-type: none"><li>1. Hands-On Game Development without Coding: Create 2D and 3D games with Visual Scripting in Unity Kindle Edition by Lucas Bertolini (Author)</li><li>1. Game Programming in C++: Creating 3D Games, First Edition by Sanjay Madhav</li><li>2. Getting Started with Unity 2018: A Beginner's Guide to 2D and 3D game development with Unity, 3rd Edition Paperback – Import, 22 Mar 2018 by Dr. Edward Lavieri (Author)</li><li>3. <a href="https://gamedevelopment.tutsplus.com/tutorials/a-beginners-guide-to-designing-video-game-levels--cms-25662">https://gamedevelopment.tutsplus.com/tutorials/a-beginners-guide-to-designing-video-game-levels--cms-25662</a></li></ol>	

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**Paper: 3D Character Development & Rigging**

**Code: BGD – 391**

**Contacts Hours / Week: 3P**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	Working with 3D, Low poly character modelling. Male body vs Female body, cartoon making process. Animal making, Alien body, physics of making characters.
Unit 2	Indian character development, Russian character development, sculpting in software, depth of character making, how rigging works. Need of rigging, working with rigged body, human rigging, animal rigging, alien rigging
<b>Suggested Readings:</b>	
1. <a href="https://www.youtube.com/watch?v=cOokoFED7QE">https://www.youtube.com/watch?v=cOokoFED7QE</a>	
2. <a href="https://www.youtube.com/watch?v=_TaYF-lt6vA">https://www.youtube.com/watch?v=_TaYF-lt6vA</a>	
3. <a href="https://www.youtube.com/watch?v=487VwwL95hE">https://www.youtube.com/watch?v=487VwwL95hE</a>	

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**Syllabus for B. Sc. In Gaming**

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**Paper: Defining Game with Animation**

**Code: BGD – 392**

**Contacts Hours / Week: 3P**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	CubeShip Game, Working with Animations, UI Development, Unity Editor Intermediate Topics. Raycasting
Unit 2	Start on Game Design, Game Programming, Objects in a 3D animation exist in an X, Y & Z world , Animation vs Video Game Design, Different Types of Animation in game.
<b>Suggested Readings:</b>	
<ol style="list-style-type: none"><li>1. Hands-On Game Development without Coding: Create 2D and 3D games with Visual Scripting in Unity Kindle Edition by Lucas Bertolini (Author)</li><li>2. Getting Started with Unity 2018: A Beginner's Guide to 2D and 3D game development with Unity, 3rd Edition Paperback – Import, 22 Mar 2018 by Dr. Edward Lavieri (Author)</li><li>3. The Animator's Survival Kit: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators Paperback – 8 Dec 2009 by Richard Williams</li><li>4. <a href="https://www.raywenderlich.com/2505-unity-4-3-2d-tutorial-animations">https://www.raywenderlich.com/2505-unity-4-3-2d-tutorial-animations</a></li></ol>	

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**Syllabus for B. Sc. In Gaming**

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**Paper: Advanced AI, Sound & Game Design**

**Code: BGD – 393**

**Contacts Hours / Week: 3P**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	Debugging, Editor extensions I/O. Intro to 3D AI. AI Path Planning Agent/Decision Architectures Camera Programming (Camera System Overview, Camera Fundamentals, Camera Types, Cinematic Cameras, Camera Design Principles, Prevent the camera passing through (or close to) game objects or physical environmental features, Game Genre Cameras, Camera Design Process, Player Control ) Audio Programming – Sound, Optimise sounds, sound making, music loops, 10 secs music vs 3 secs music. Audio program with engine and objects
Unit 2	3D Game Design Level Design & Tutorials (Understanding Constraints, General Constraints, Critical Constraints, Game's Macro Design Require, Bubble Diagrams, Rough Maps, Connect the Areas Together, Finishing the Design) . Last major game design, 3D Models, texture & lights.
<b>Suggested Readings:</b>  <ol style="list-style-type: none"><li>1. Game Programming in C++: Creating 3D Games, First Edition by Sanjay Madhav</li><li>2. Fundamentals of Real-Time Camera Design Mark Haigh-Hutchinson</li><li>3. A Classical Approach to Artificial Intelligence, M.C. Trivedi, Khanna Publishing House</li></ol>	

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**Paper: HTML 5 Game**

**Code: BGD – 394**

**Contacts Hours / Week: 3P**

**Credits: 3**

<b>Units</b>	<b>Course Content</b>
Unit 1	Procedural programming in game development, what are browser, future of web based games, why HTML 5 games. HTML 5 and CSS 3 programming. Creating the canvas, Game loop, Creating the player, Keyboard controls.
Unit 2	Physics Programming , Player movement, Adding more game objects Projectiles, Enemies, Loading and drawing images, Collision detection, Sound.
<b>Suggested Readings:</b>	
1. <a href="https://www.html5rocks.com/en/tutorials/canvas/notearsgame/">https://www.html5rocks.com/en/tutorials/canvas/notearsgame/</a>	
2. <a href="https://www.youtube.com/watch?v=5JqjwYn8pw">https://www.youtube.com/watch?v=5JqjwYn8pw</a>	
3. <a href="https://www.youtube.com/watch?v=3EMxBkqC4z0">https://www.youtube.com/watch?v=3EMxBkqC4z0</a>	

**Internship & Lab Making**

**Code: BGD – 395**

**Contacts Hours / Week: 3P**

**Credits: 3**

Students are required to make one full project from their given curriculum.