Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Sc. In Gaming & Mobile Application Development
(Effective for Academic Session 2019-2020)

SEMESTER-III

Paper: 3D Character Development & Rigging
Code: BGD – 301
Contacts Hours / Week: 1L+2P
Credits:3

Units	Course Content
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

Suggested Readings:

1. https://www.youtube.com/watch?v=cOokoFED7QE
2. https://www.youtube.com/watch?v=_TaYF-lt6vA
3. https://www.youtube.com/watch?v=487VwwL95hE

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Paper: 3D Animation
Code: BGD – 302
Contacts Hours / Week: 1L+1T+1P
Credits:3

Units	Course Content
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

Suggested Readings:

1. https://www.youtube.com/watch?v=m9N_sIBRWvY
2. 3D Animation for the Raw Beginner Using Maya (Chapman & Hall/CRC Computer Graphics, Geometric Modeling, and Animation by Roger King
3. https://www.youtube.com/watch?v=H4AuZzRLves
4. https://www.lynda.com/3D-Animation-training-tutorials/1-0.html

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Paper: Defining Game with Animation
Code: BGD – 303
Contacts Hours / Week: 1T+2P
Credits:3

Units	Course Content
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.
Suggested Readings:	

Suggested Readings:

1. Hands-On Game Development without Coding: Create 2D and 3D games with Visual Scripting in Unity Kindle Edition by Lucas Bertolini (Author)
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)
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
4. https://www.raywenderlich.com/2505-unity-4-3-2d-tutorial-animations

Paper: Game Design
Code: BGD – 304
Contacts Hours / Week: 1L+1T+1P
Credits:3

Units	Course Content
Unit 1	Game Design wrap-up, Intermediate Game Production Topics, Useful code libraries, Data Structures Global Illumination. 2D Game Jam
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.

Suggested Readings:

1. Hands-On Game Development without Coding: Create 2D and 3D games with Visual Scripting in Unity Kindle Edition by Lucas Bertolini (Author)
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)
3. https://gamedevelopment.tutsplus.com/tutorials/a-beginners-guide-to-designing-video-game-levels--cms-25662

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Paper: Advanced AI, Sound and Physics in Game Design
Code: BGD – 305
Contacts Hours / Week: 1L+1T+1P
Credits: 3

Units	Course Content
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	Physics Programming , Multiplayer/Network Programming Overview, Tools Programming Overview More on 3D level texture & lights

Suggested Readings:

1. Game Programming in C++: Creating 3D Games, First Edition by Sanjay Madhav
2. Fundamentals of Real-Time Camera Design Mark Haigh-Hutchinson

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Paper: HTML 5 Game
Code: BGD – 306
Contacts Hours / Week: 1L+1T+1P
Credits:3

Units	Course Content
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.
Suggested Readings:	

Suggested Readings:

1. https://www.html5rocks.com/en/tutorials/canvas/notearsgame/
2. https://www.youtube.com/watch?v=5JqdjwYn8pw
3. https://www.youtube.com/watch?v=3EMxBkqC4z0

Internship & Lab Making
Code: BGD – 307
Contacts Hours / Week: 2P
Credits: 2