

# ZU/WI/7/11

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| Unit Code: | BSD 412 |
| Unit Title: | GAME DESIGN AND DEVELOPMENT |
| Pre-requisites | BCE 221: Computer Vision, BSD 316: Visual Programming |
| Program(s): | BSE Y4S1 |
| Lecturer Name: | Samuel Maina |
| Lecturer Contacts: | Email: [samuel.muriuki@zetech.ac.ke](mailto:samuel.muriuki@zetech.ac.ke) Phone: 0726 369 935 |
| Consultation time : | Wednesday 11.00Am -2.00 Pm |

**UNIT PURPOSE**

The purpose of the course is to provide a strong foundation in software engineering, programming, and the C# language; and to work on all major aspects of developing video games using the Unity engine. It involves concept development, structural specification, audience analysis, technical adaptation, documentation and communication. Key to the process is innovation! That is, developing new forms and formats; new ways to communicate, educate and entertain; and new ways of using digital media to engage audiences with meaning and purpose.

# Course Content

A Brief History of Video Games, Games and Society, Game Design, Teams and Processes, Programming Fundamentals, Debugging Games, Game Architecture, Memory and I/O Systems, Mathematical Concepts, Collision Detection and Resolution, Graphics, Artificial Intelligence, Networks and Multiplayer Mode. Programming environment, game hardware, mathematical concepts, physical concepts, and graphics- review the content

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| **Week** | **Topic** | **Credit hours** |
| Week 1. | **Unity Game Development**  **Introduction to unity:** Overview of unity editor   * The Project Dialog * The Unity Interface * The Project View * The Hierarchy View | 3 |
| Week 2. | **Game Objects:**  Dimensions and Coordinate Systems   * Putting the D in 3D * Using Coordinate Systems | 3 |

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|  | * World Versus Local Coordinates |  |
| Week 3 | **ASSIGNMENT 1**  **Models, Materials, and Textures:**  The Basics of Models   * Built-In 3D Objects * Importing Models * Models and the Asset Store | 3 |
| Week 4 | **CAT 1**  **Game Environments (**terrain settings**)** Generating Trees and Grass   * Painting Trees * Painting Grass * Terrain Settings | 3 |
| Week 5 | **Lights and Cameras:**  Lights   * Point Lights * Spotlights * Directional Lights | 3 |
| Week 6 | **ASSIGNMENT 2**  **Scripting—Part 1: C# using unity frame work**  Scripts   * Creating Scripts * Attaching a Script * Anatomy of a Basic Script * The Using Section   (Class exercise : *demo illustrating a tetra game development*) | 3 |
| Week 7 | **Scripting—Part 2:**  Methods   * Anatomy of a Method * Writing Methods * Using Methods * Input | 3 |
| Week 8 | **CAT 2**  **Collision**  Rigid bodies   * Collision * Colliders   Prefab Basics (*3D gaming to demo: to illustrate the collision detection concept* ) | 3 |

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| Week 9 | **Prefab Basics**  Prefab Terminology   * Prefab Structure * Working with Prefabs * Adding a Prefab Instance to a Scene | 3 |
| Week 10 | **2D Games Tools**  The Basics of 2D Games   * The 2D Scene View * Orthographic Cameras * Adding Sprites * Importing Sprites | 3 |
| Week 11 | **Mathematics 2D**  •Cartesian Coordinate Systems  •World space, object space, camera space | 3 |
| Week 12 | **Mathematics:**   * Vectors * Matrices | 3 |
| Week 13 | **Mobile Development**  Preparing for Mobile   * Setting Up Your Environment * The Unity Remote | 3 |
| Week 14 | EXAMS | 3 |

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| **Course Assessment** |  |
| Continuous Assessment Test (CATS) | 20% |
| Assignments | 10% |
| Examination | 70% |
| **Total** | **100%** |

Lectures; Tutorials; Practical; Programming exercises.



**Teaching Methodology:**

Audio visual aids in lecture rooms; Computer laboratory.



**Instructional materials/Equipment:**



**Required text books**

# Recommended Texts:

**Core Reading Materials for the Course**

1. Schell, J. (2020). The art of game design: A book of lenses. Boca Raton: CRC Press, Taylor & Francis Group.
2. Macklin, C., & Sharp, J. (2016). Games, design and play: A detailed approach to iterative game design. Boston: Addison-Wesley.

# Recommended Reference Materials

1. *Tekinbaş, K. S., & Zimmerman, E. (2006). The game design reader: A Rules of play anthology. Cambridge, MA: MIT Press.*
2. *Rabin, S. (2010). Introduction to Game Development, 2nd ed. Boston, MA: Charles River Media.*
3. *Swink, S. (2009). Game feel: A game designer's guide to virtual sensation. Amsterdam: Morgan Kaufmann /Elsevier.*
4. Salen, K., & Zimmerman, E. (2010). Rules of play: Game design fundamentals. Cambridge, Mass: The MIT Press.

# Course Journals

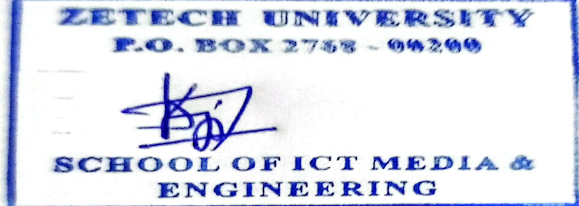
1. International Journal of Innovation and Technology Management- ISSN: 1793-6950
2. Journal of Systems and Software- ISSN: 0164-1212
3. Information systems Journal- ISSN: 1365-2575

# E-Resources

1. Kapralos, B., Fisher, S., Clarkson, J. and van Oostveen, R. (2015). A course on serious game design and development using an online problem-based
2. learning approach. Interactive Technology and Smart Education, Vol. 12 No. 2, pp. 116-

136. https://doi.org/10.1108/ITSE-10-2014-0033 2. Lassila, E.M., Moilanen, S. and Järvinen, J.T. (2019). Visualising a “good game”: analytics as a calculative engine in a digital environment. Accounting, Auditing & Accountability Journal, Vol. 32 No. 7, pp. 2142- 2166. https://doi.org/10.1108/AAAJ-11-2017-3252

Approved for circulation by:

Yours faithfully,  




David Kanyi

Head, ICT and Engineering Department

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