



**COLLEGE OF COMPUTING EDUCATION**  
**BACHELOR OF SCIENCE IN ENTERTAINMENT AND MULTIMEDIA COMPUTING - GAME DEVELOPMENT**  
**COURSE OFFERINGS FOR SY 2022-2023**

<b>FIRST YEAR</b>			
<b>First Semester</b>	<b>Subject Title</b>	<b>Unit</b>	<b>Course Description</b>
EMC 1/L	Introduction to EMC	3.0	This course is one of the foundations in the effective rendition for the higher level of game design and development. This course provides an introduction to game development and covers topics in animation of shapes and objects, slideshow creation, incorporation of media to movies and adding keyframes.
CCE 102/L	Computer Programming 1	3.0	This course introduces the students to the fundamentals of logic formulation together with their implementation in the Java programming language with the use of Eclipse as the Integrated Development Environment. It covers fundamental programming concepts such as algorithmic processes, data types, variables, objects, expressions, control structures (sequence, selection and looping), file handling, methods and arrays.

<b>Second Semester</b>			
	<b>Subject Title</b>	<b>Unit</b>	<b>Course Description</b>
CCE 103/L	Computer Programming 2	3.0	This course covers the object-oriented design, encapsulation and information hiding, separation of behavior and implementation, classes and subclasses, inheritance, polymorphism, class hierarchies, and collection classes and iteration protocols. This includes the applications and implementation of the relationship between an object and its corresponding class and use appropriate algorithm for solving computing problems.
EMC 2/L	Freehand and Digital Drawing	3.0	This course covers basic computer illustration skills: seeing proportions, angles, spatial relationships and grounds: expressing ideas visually using varying techniques, rules of composition, and subject matter; understanding the necessity of thoroughly formulating and investigating ideas, doing practice sketches; appreciation of a finished work of digital art.

<b>SECOND YEAR</b>			
<b>First Semester</b>	<b>Subject Title</b>	<b>Unit</b>	<b>Course Description</b>

EMC 3/L	Introduction to Game Design and Development	3.0	This course gives an overview of the game development process from conception to production. It also discusses a history of game development here and abroad, and exposure to positions, job responsibilities that each member of a game development team has along with the industry requirements for the creation of a game design document (GDD) and technical design document (TDD). Game design includes game play, storytelling, challenges, and basic interactive design, which includes interface design, information design and world interaction. Students will experience designing a small casual game and understand the complexities in developing these projects. The experience will be used as a foundation for more advanced courses in the program.
EMC 4/L	Data Structures and Algorithms	3.0	This course introduces the students the principles of the data structures implementations using Java language. It covers different algorithms that show how to model a variety of real-world problems in computing using appropriate forms of linear and hierarchical data structures and representing organization of a hierarchical file system and database file structure.
GD 1/L	Game Programming 1	3.0	This course covers the fundamentals of creating 2D computer games. Topics include handling game objects, reading reusable resources, the use of external libraries for all major components such as input, graphics and sound.

Second Semester	Subject Title	Unit	Course Description
EMC 5/L	Computer Graphics Programming	3.0	This course covers computer graphics programming that applies to games, computer-aided design, virtual simulators and visualizations. This course also include topics in mathematical foundations of graphics like 2D and 3D coordinate systems.
EMC 6/L	Human Computer Interaction	3.0	The course intends to introduce students to the discipline concerned with the design, evaluation & implementation of various computing systems intended for human use. Emphasis will be placed on understanding human behavior with interactive objects, knowing how to develop and evaluate interactive software using a human-centered approach, and general knowledge of HCI design issues with multiple types of interactive applications.
EMC 7/L	Principles of 2D Animation	3.0	This course provides students with an appreciation for the art of animation by surveying its history, types, production processes, and current industry trends. It aims to equip students with the skills of visual storytelling through the interpretation of narrative and movement via traditional and digital hand-drawn animation techniques.

EMC 8/L	Information Management	3.0	This course discusses basic concepts and definitions of database programming, the basics of Relational Databases as one of the fundamental data storage technology of an entertainment system. It also includes discussion on the processes involves in the development of database. In this course, the students will be able to learn on how to design database based on database design concepts and principles, able to document design using ERD and use SQL to manipulate data and information. Also, in particular the subject focuses on database analysis design and management applicable to students taking up BSEMC.
GD 2/L	Game Programming 2	3.0	This course offers basic comprehension of the systems required to develop a usable and reusable foundation for game development. This course give emphasis to the graphical nature of game engines, animation techniques and optimization algorithm.
GD 3/L	Applied Mathematics for Games	3.0	This course enables students to strengthen and increase their understanding of mathematics with special emphasis on game development. Topics include discrete mathematics, probability, and mathematical game theory.

THIRD YEAR			
First Semester	Subject Title	Unit	Course Description
EMC 9/L	Audio Design and Sound Engineering	3.0	This course provides students with an appreciation for sounds. This course includes topics in audio recording, sound editing and mixing. This course also explores the different tools to create and capture sounds.
EMC 10	Script Writing and Storyboard Design	3.0	This course explores the different techniques in interpretation of story with the goal of identifying themes and procedures for creating game ideas. This course also includes topics on how to define characters, setting, and structure to create a game concept.
EMC 11/L	Principles of 3D Animation	3.0	In this course, students learn how to become proficient 3D model builders, and animators using current industry software. Students will be introduced to several other aspects of the software's capabilities as it relates to the motion picture field, commercials, special effects, multimedia, webpage content, and game development.
GD 4/L	Applied Game Physics	3.0	This course is designed to provide theoretical mathematical background and principles of physics and their application in game development. This course gives emphasis on physics principles that are used to model interactions of various objects.

GD 5/L	Game Programming 2	3.0	This course will address advanced topics in game development that are also modern practices in the industry. The course, which is a continuation from Game Programming 2, will tackle AR and VR concepts and theories which are currently adapted as standard practices for high end graphics in computer games. At the end of the course, students will be familiar with and be able to apply these concepts by optimizing their projects and adding high-quality special effects.
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Second Semester	Subject Title	Unit	Course Description
GD 6/L	Artificial Intelligence in Games	3.0	This course explores a vastly broadened perspective on the use of AI in games and playable media: AI as adversary, actor, design assistant, designer, quality assurance tester, data analyst, player, tutor, etc. Combining elements from academic AI and machine learning with industry Game AI techniques, students will develop systems that control non-player characters (NPCs), assist designers in analyzing existing level designs and synthesizing new ones, and statistically model player behavior in a visually comprehensible way.
GD 7/L	Advanced Game Design	3.0	This course covers software engineering and control/state aspects of developing a 3D video game. Students will work in teams to design, implement and test a 3D game with animation, interactivity, sounds, constraints and networking capabilities.
GD 8/L	Game Networking	3.0	This course takes an in-depth look at all the major concepts necessary to program a networked multiplayer game. This course discusses the basics of transmitting data for games—how to prepare game data to be sent over the network, how to update game objects over the network, and how to organize the computers involved in the game. It also covers integrating gamer services into and using cloud hosting for dedicated servers.
GD 9/L	Game Production	3.0	The course covers the entire project process from conception to implementation: preparatory work, concept documentation, written project plans, regular monitoring and reporting in accordance with the project plan and the implementation, presentation and evaluation of the project.
EMC 12/L	Design and Production Process	3.0	This course covers the technical workflow required to establish the framework upon which games are structured. The students will evaluate engines and game technology, determine a technical implementation plan, and create a technical Design Document for their final project. Students learn how to use industry standard version control software and use it throughout their final project development.

GD 10/L	GD Elective 1	3.0	The course takes a website pilot project from start to finish, from setting up the HTML page and containers to styling established elements for small, medium and large screens. This course also covers how to reposition the navigation bar for better viewing on mobile devices, create animated transitions, and turn bulleted lists into interactive menus with full touch support.
CCE 106/L	Application Development and Emerging Technologies	3.0	This course covers the development of applications using web, mobile and emerging technologies with emphasis on requirement management, interface design, usability, testing and deployment, including ethical and legal considerations. The student is expected to design and develop a sufficiently computer application that solves complex problems.

Subject Title		Unit	Course Description
<b>Summer</b>			
GD 11/L	Capstone Project 1	3.0	The course focuses on the proposal stage. The students are expected to write papers from Chapter 1 to Chapter 3. Chapter 1 composed of the Background of the study, objectives, significance of the study, scope and delimitations of the proposed study. Chapter 2 composed of the related literature, and systems. Chapter 3 composed of the conceptual framework and the technical discussions of the technology to be utilized by the researchers. The paper will be presented in the title and outline defense.
IT 19/L	Technopreneurship	3.0	This course covers the principles and theories of technopreneurship. This course prepares the students to be budding technopreneurs through a journey of gradual process of self-mastery, environment mastery, enterprise mastery and the development of business plan (SEED course model). At the end of the course, the students are expected to develop a feasible entertainment business plan using lean startup model and present it. Furthermore, it is hoped that they pursue their business plans as start-ups and eventually transform them into stable animation or game development enterprises.

First Semester	Subject Title	Unit	Course Description
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GD 12/L	Capstone Project 2	6.0	This subject is a continuation of Capstone Project 1 and focuses on the implementation phase of the project and evaluation of its testing. Based on the instrument constructed in pre-requisite course, the project will be validated by experts in the field and research coordinator of the college, by then, it will launch an alpha testing for selected groups of users and then followed by a beta testing. The findings, conclusions, and recommendations after a series of tests and evaluation will be presented in the final defense.
GD 13/L	GD Elective 2	3.0	This course covers principles of game design and mechanics, development processes such as rapid prototyping and iterative design, and common methods of project management for creative software development. It will examine business aspects of the industry that impact our designs, including demographics, economic models, budgets, and marketing.

Second Semester	Subject Title	Unit	Course Description
GD 14	On-the-Job Training	9.0	This course is designed to expose the students to the real-world problems and situations by letting them work as on-the-job trainees in various establishments in the region. The exposure will help them acquire the skills and experiences necessary for becoming Entertainment and Multimedia professionals.











