MCAST

MQF Level 6

IT6-A4-23

Bachelor of Science (Honours) in Digital Games Development

Course Specification

Course Description

The degree in Digital Games Development offers learners the extra edge when it comes to the creation of entertainment software. The taught component provides insight on the various stages involved in game design and development. Students will learn to utilise state of the art tools and technologies for implementing digital games. Such artefacts require a variety of skills alongside 3D game engines. These skills include UX/UI design, game level design, software development, software testing, content creation (through audio/visual tools), 3D modelling, networking, game logic, AI, mathematics, physics, etc. Additionally, work placements will not only allow learners to understand the roles and responsibilities in an organisation. They will work on real-world problems and will understand the importance of decision-making, problem solving, whilst being effective team players. Finally, through the research component, students will explore how to investigate, resolve, and present findings related to a research problem in a given domain. There is also a "double Degree route" for those aspiring game developers who would like to extend their studies and work experience abroad, and take their existing qualification in Digital Games Development, Multimedia Software Development, or Software Development to the next level.

Programme Learning Outcomes

At the end of the programme the learner will be able to:

1. *Recognise the underpinnings of Game Design.*
2. *Apply the acquired knowledge in real-world prototypes.*
3. *Produce a solid Portfolio that is relevant to* Digital Games companies.
4. *Carry out work-based learning locally.*

Entry Requirements

MCAST Advanced Diploma in IT
iGaming or Software Development or Multimedia Software Development
OR
2 A-Level passes and 2 I-Level passes
Compulsory A-Level: Computing
AND
Compulsory A-Level or I-Level: Mathematics (Pure or Applied) or Physics

Key Information

Awarding Body – MCAST

Accreditation Status – Accredited via MCAST's Self Accreditation Process (MCAST holds Self-Accrediting Status as per 1st schedule of Legal Notice 296/2012)

Type of Programme: Qualification

MQF Level	Examples of Qualifications	'Qualification' Minimum Credits Required	'Award' Credits Required
Level 8	Doctoral Degree Third Cycle Bologna Process	NA	NA
Level 7	Masters Second Cycle Bologna Process	90-120	Less than 30
	Post-Graduate Diploma	60	
	Post-Graduate Certificate	30	
Level 6	Bachelor[23]/Bachelor (Hons.)[24] First Cycle Bologna Process	180-240	Less than 180
Level 5	Short Cycle Qualification	120	Less than 60
	Undergraduate Higher Diploma	90	
	Undergraduate Diploma	60	
	Undergraduate Certificate	30	
	VET Level 5 Programme[25]	60-120	
Level 4	Pre-Tertiary Certificate	30	Less than 120
	VET Level 4 Programme[26]	120	
	MATSEC Certificate	NA	
Level 3	VET Level 3 Programme[27]	60	Less than 60
	General and Subject Certificate	NA	
Level 2	VET Level 2 Programme[28]	60	Less than 60
	General and Subject Certificate	NA	
Level 1	VET Level 1 Programme[29]	40	Less than 40
	General and Subject Certificate	NA	
Introductory Level A	Preparatory Programme	30	Less than 30
Introductory Level B	Pre-entry Basic Skills Course	30	Less than 30

Table 1: Minimum number of credits for 'Qualifications' and parameters for 'Awards'

Fig.1: p56, Ministry for Education and Employment & National Commission for Further and Higher Education Malta (2016). *Referencing Report, 4th Edition*. NCFHE.

Total number of Hours: 4500

Mode of attendance: Full Time

Duration: 3 Years

Target audience for MCAST full-time courses is 16 to 65+

Target group:

- Qualified Professional Developers interested in a career shift or in upgrading their skillset within the Digital Games Sector.
- Students that have completed an Advanced Diploma at MCAST ICT in iGaming / Software Development / Multimedia Software Development.
- Students in possession of Mathematical / Scientific / Programming qualifications at Advanced Level.

The official language of instruction at MCAST is English. All notes and textbooks are in English (except for language courses which will be in the respective language being instructed). International candidates will be requested to meet English language certification requirements for access to the course.

This course will be offered at

MCAST has four campuses as follows:

MCAST Main Campus
Triq Kordin, Paola, Malta

All courses except for the Institute for the Creative Arts, Centre of Agriculture, Aquatics and Animal Sciences are offered here.

Institute for the Creative Arts
Mosta Campus
Misraħ Għonoq Tarġa Gap,
Mosta

Institute of Applied Sciences,
Centre of Agriculture, Aquatics and Animal Sciences,
Luqa Road, Qormi

Gozo Campus
J.F. De Chambray Street
MCAST, Għajnsielem
Gozo

Teaching, Learning and Assessment

The programmes offered are vocational in nature and entail both theoretical lectures delivered in classes as well as practical elements that are delivered in laboratories, workshops, salons, simulators as the module requirements dictate.

Each module or unit entails a number of in person and/or online contact learning hours that are delivered by the lecturer or tutor directly (See also section 'Total Learning Hours).

Access to all resources is provided to all registered students. These include study resources in paper or electronic format through the Library and Resource Centre as well as tools, software, equipment and machinery that are provided by the respective institutes depending on the requirements of the course or module.

Students may however be required to provide consumable material for use during practical sessions and projects unless these are explicitly provided by the College.

All Units of study are assessed throughout the academic year through continuous assessment using a variety of assessment tools. Coursework tasks are exclusively based on the Learning Outcomes and Grading Criteria as prescribed in the course specification. The Learning Outcomes and Grading Criteria are communicated to the Student via the coursework documentation.

The method of assessment shall reflect the Level, credit points (ECTS) and the schedule of time-tabled/non-timetabled hours of learning of each study unit. A variety of assessment instruments, not solely Time Constrained Assignments/Exams, are used to gather and interpret evidence of Student competence toward pre-established grading criteria that are aligned to the learning outcomes of each unit of the programme of study.

Grading criteria are assessed through a number of tasks, each task being assigned a number of marks. The number of grading criteria is included in the respective Programme Specification.

The distribution of marks and assessment mode depends on the nature and objectives of the unit in question.

Coursework shall normally be completed during the semester in which the Unit is delivered.

Time-constrained assignments may be held between 8 am and 8 pm during the delivery period of a Unit, or at the end of the semester in which the Unit is completed. The dates are notified and published on the Institute notice boards or through other means of communication.

Certain circumstances (such as but not limited to the Covid 19 pandemic) may lead Institutes and Centres to hold teaching and assessment remotely (online) as per MCAST QA Policy and Standard for Online Teaching, Learning and Assessment (Doc 020) available via link https://www.mcast.edu.mt/college-documents/

The Programme Regulations referenced below apply. (DOC 005 available at: link https://www.mcast.edu.mt/college-documents/

Total Learning Hours

The total learning hours required for each unit or module are determined as follows:

Credits (ECTS)	Indicative contact hours	Total Student workload (hrs)	Self-Learning and Assessment Hours
1	5 – 10 hrs	25 hrs	20-15 hrs*
2	10 – 20 hrs	50 hrs	40-30 hrs*
3	15 – 30 hrs	75 hrs	60-45 hrs*
4	20 – 40 hrs	100 hrs	80-60 hrs*
6	30 – 60 hrs	150 Hrs	120-90 hrs*
9	45 – 90 hrs	225 hrs	180-135 hrs*
12	60 – 120 hrs	300 hrs	240-180 hrs*

* The 'Self-Learning and Assessment Hours' amount to the difference between the contact hours and total student workload.

Grading system

All MCAST programmes adopt a learner centred approach through the focus on Learning Outcomes. The assessment of MCAST programmes is criterion-referenced and thus

assessors are required to assess learners' evidence against a pre-determined set of Learning Outcomes and assessment criteria.

For a student to be deemed to have successfully passed a unit, a minimum of 50% (grade D) must be achieved. In case of part time programmes, the student must achieve a minimum of 45% to successfully pass the unit.

All units are individually graded as follows:
A* (90-100)
A (80-89)
B (70-79)
C (60-69)
D (50-59)
Unsatisfactory work is graded as 'U'.

Work-based learning units are graded on a Pass/Fail basis only.

Detailed information regarding the grading system may be found in the following document: DOC 005 available at: link https://www.mcast.edu.mt/college-documents/

Intake Dates

•MCAST opens calls for application once a year between July and August of each year for prospective applicants residing in MALTA.
•Applications to full-time courses from international students not residing in MALTA are accepted between April and Mid-August.
•For exact dates re calls for applications please follow this link https://www.mcast.edu.mt/online-applications-2/

Course Fees

MCAST course are free for Maltese and EU candidates. International candidates coming from outside the EU need to pay fees for the respective course. Course fees are set on a per-level and course duration basis. For access to course fee structure and payment methods please visit https://www.mcast.edu.mt/fee-payments-for-non-eu-candidates/.

Method of Application

Applications to full-time courses are received online via the College Management Information System. Candidates can log in using Maltese Electronic ID (eID) or European eIDAS (electronic identification and trust services) to access the system directly and create an account as the identity is verified electronically via these secure services.

Non-EU candidates need to request account creation though an online form by providing proof of identification and basic data. Once the identity is verified and the account is created the candidate may proceed with the online application according to the same instructions applicable to all other candidates.

Non-EU candidates require a study visa in order to travel to Malta and joint the course applied for. For further information re study-visa please access https://www.identitymalta.com/unit/central-visa-unit/.

For access to instructions on how to apply online please visit https://www.mcast.edu.mt/online-applications-2/

Contact details for requesting further information about future learning opportunities:

MCAST Career Guidance
Tel: 2398 7135/6
Email: career.guidance@mcast.edu.mt

Current Approved Programme Structure

Unit Code	Unit Title	ECTS	Year	Semester
ITDGM-506-2301	Fundamentals of Game Programming	6	1	1
ITMMD-506-2001	Object Oriented Programming	6	1	1
ITDGM-506-2302	Design Concepts	6	1	1
ITSFT-506-1606	Software Engineering	6	1	1
CDKSK-503-1907	English I	3	1	1
ITSFT-506-1608	Data Structures and Algorithms	6	1	2
ITDGM-506-2303	Procedural Content Generation	6	1	2
ITMTH-506-1602	Applied Maths	6	1	2
ITDGM-506-2304	Mobile Game Development	6	1	2
CDWBL-506-1901	Work Based Learning	6	1	2
ITDGM-503-2305	Game Mechanics I	3	1	2
CDWBL-506-1902	Work Based Learning II	6	2	1,2
ITMSD-506-1607	Game Level Design	6	2	1
ITMSD-506-2301	Database Essentials	6	2	1
ITMSD-506-2302	3D Graphics	6	2	1
ITMSD-506-1602	Sound Design	6	2	1
ITDGM-503-2306	Game Mechanics 2	3	2	1
ITDGM-506-2307	3D Character Development & Animation	6	2	2
ITDGM-506-2308	3D Project	6	2	2
ITRSH-506-2101	Research Design I	6	2	2
CDKSK-604-1909	Entrepreneurship	4	2	2
CDKSK-602-2105	Community and Social Responsibility	2	2	2
CDKSK-503-1908	English II	3	2	2
ITDGM-606-2309	Game AI	6	3	1
ITDGM-606-2310	Advanced Game Programming	6	3	1
ITDGM-606-2311	Enterprise 3d	6	3	1
ITMSD-606-2303	XR Development	6	3	1
ITMSD-606-2304	WebGL Development	6	3	2
ITDGM-606-2312	Multiplayer Game Development	6	3	2
ITMSD-606-1610	Sound Engineering	6	3	2
ITRSH-606-2102	Research Design II	6	3	2
ITDIS-612-1601	Dissertation	12	3	2
Total ECTS		**180**	**/**	**/**

ITMMD-506-2001: Object Oriented Programming

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit builds on the previous programming and games development courses, namely Introduction to Object Oriented Programming and Programming for Computer Games. The purpose of this unit is to focus on applying Object Oriented Programming principles in multimedia design and development.

The aim of this unit is to provide the learner with the programming skills and logic needed to develop a game or multimedia project with more advanced code, gameplay, mechanics and AI. This unit will help the learner learn abstract OOP concepts through a more visual and pragmatic approach. It Is envisaged that during lectures OOP concepts like abstraction, encapsulation, inheritance, polymorphism, are presented using practical and visual game examples. Learners will be required to practice hands-on the different OOP concepts learnt in class, by developing their own game projects. Other important concepts and features like persistence, File IO, event handling and state machines will also be introduced.

This unit requires prerequisite programming knowledge of data types, variables, and constants, basic use of classes/ objects, selection, iteration, arrays/lists and string handling. The prerequisite game development knowledge required includes: how to use sprites and game objects, include physics, write simple scripts, attach scripts to the appropriate game objects as components, implement user input controls, and add text UI output.

The first aspect of this module will be to revise together with the learner, basic object-oriented concepts and game development skills. This revision includes classes, methods, constructors, encapsulation, inheritance, game objects, components, physics, user input, and event-driven UI.

Following this, learners learn to understand and apply encapsulation, abstraction, inheritance and polymorphism through the development of game examples. Statics, singletons, coroutines, exception handling, state machines and event management are also introduced with the aim of learning how to develop robust code and scalable game designs. Finally, learners will be encouraged to implement a complete small 2D/3D game or multimedia application utilising the concepts learnt.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand object-oriented programming concepts and their usefulness in game or multimedia development.*
2. *Apply understanding of object-oriented concepts in the design of games or multimedia applications.*
3. *Produce game solutions that leverage object-oriented design principles, to be able to address requirements and ensure best practices are adhered to.*
4. *Implement solution algorithms, which include well-scripted gameplay, state machines, exception handling, event management, menus, persistence and data storage.*

ITSFT-506-1606: Software Engineering

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit has been designed to introduce learners to the main concepts behind the science of software engineering. Throughout the course of their studies, students will acquire the skills to understand and support the complete life cycle of a software system – from inception, requirements elicitation and design, through the various stages until release and maintenance. Students will gain an understanding of different software development techniques and will learn how to critically select which technique is best suited to the development of different systems.

The unit places focus on some of the more recent software development processes, making particular emphasis on the Agile philosophy of software development. Students will understand the agile process and its constituent components, its applicability to modern software development and the various actors involved in the process together with their roles and responsibilities. Another core component of this module will be that of introducing students to the Unified Modelling Language, UML, as a tool to facilitate and speed up the software development process. The various constructs of this modelling language will be covered, together with explanations of how they can be utilised to specify and document the software and business processes.

This unit will also present students with a range of advanced software engineering concepts and approaches which will give them the skills required to be able to support new and evolving developments. Students will be introduced to a number of different software architectures and design approaches and they will be encouraged to analyse which setups are most adequate as solutions for diverse scenarios.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Plan and tackle a small software design project as part of a team using an Agile approach.*
2. *Perform a requirements acquisition exercise in order to identify the main functional and non-functional requirements of a proposed software system.*
3. *Identify and construct the most applicable UML modelling diagrams to use in particular phases in a software system's development process to achieve a specified goal.*
4. *Design a solution to a problem by proposing the most suitable architecture and utilising known design patterns.*

ITSFT-506-1608: Data Structures and Algorithms

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

The basis of solving a problem requires an understanding of how to break it down into a series of much more manageable small parts. In order to do this, students need to be able to assess the complexity of a problem. Once the algorithm has been broken down into smaller sections, a student should start to write logical instructions using pseudocode. Each instruction in turn will manipulate data, which may be for instance array structures, which are similar to vectors in mathematics or abstract data types such as pointers, these are similar to how machine code uses memory addresses to access data.

In this unit students will learn about writing algorithms for common problems such as Queues and thereby choosing the most appropriate data structure.

Students need to implement a series of algorithms which are well known in Computer Science. For a given algorithm a student will need to analyse the complexity and make a decision on how this may affect the efficiency of the algorithm in terms of run time. Although computers now have very powerful processors, students still need to estimate the time it would take for their algorithm to process a given amount of data. In particular as the amount of data becomes larger the amount of time it takes to process the data can grow exponentially.

Students will learn and appreciate that algorithms can be translated into programming code. This in turn will give them an insight into solving problems on paper before typing their code into a text editor for a given programming language. This experience will allow them to see how their programs run as originally indented in the specification. Also it has been written in such a way that it runs efficiently, avoiding complexity in their solution as well as making best use of the processing power of their computer system.

Data structures such as pointers, which allow a programmer to use memory addresses to access data, give the student a much more flexible method to manipulate data. For each algorithm a student needs to select the most appropriate data structure, in order to produce a solution which will carry out the required tasks as set out in the specification for a computer program.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Construct programs using Abstract Data Types and Structured Data types.*
2. *Design efficient algorithms for commonly encountered problems using existing examples.*
3. *Make use of algorithm analysis to determine the efficiency of an algorithm.*
4. *Compare algorithms in terms of their correctness, proof and intractability.*

ITMTH-506-1602: Applied Maths

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit is designed to introduce learners to the mathematical concepts they need to solve problems that can be met while developing multimedia content and any other content involving computer graphics. The unit also gives learners a head start to some mathematical concepts related to the rapidly developing industry of online betting.

Although nowadays we have a lot of graphical tools which aid in the development of such content, it is still of fundamental importance to understand the mathematical concepts that lie beneath. This would lead to a better understanding, appreciation and usage of these tools, better adaptability to other tools, and more ability to solve unseen problems that may arise.

All the content of this unit is not only delivered, but also applied, to actual multimedia/graphics scenarios. This helps to better gauge the learners' understanding and interest, as well as realise its applicability in different scenarios.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand basic mathematical concepts and apply them to a graphical context*
2. *Understand the mathematical foundations of lighting and apply them in graphical contexts*
3. *Understand the mathematical foundations of mechanics (such as acceleration, and collisions) and apply them in graphical contexts.*
4. *Understand the mathematical foundations of combinatronics and probability theory and their application in online betting/gambling scenarios.*

CDWBL-506-1901: Work Based Learning

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

The aim of this unit is to provide learners reading a degree at MCAST with the opportunity for work-based learning (WBL) with a registered MCAST partner. WBL provides learners with real-life work experiences where they can apply academic and technical skills and develop their employability. Work-based learning deliberately merges theory with practice and acknowledges the intersection of explicit and tacit forms of knowing.

Learners will be doing this unit in the summer of their first year and they will have a follow up unit in the summer of their second year so as to provide them with experience as their knowledge of the subject increases. This will enable them to develop holistically in the area they have chosen enabling them to enter the world of work fully prepared and with experience to show in the sector they have chosen. This unit will assist learners in preparing themselves to take responsibility for their own learning in the workplace and to develop the necessary confidence and attitudes to carry out tasks responsibly in real life work situations. Learners are able to gain practical, hands on experience in their chosen field of study whilst producing a work based learning portfolio and journal demonstrating their achievements and learning experiences.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Evaluate the relationship between theory, college practice and their application and development in a real world work-based activity.*
2. *Evaluate critically own performance and learning experiences at the place of work through a reflective journal.*
3. *Set SMART objectives for own improvement following the reflective exercise.*
4. *Develop an action plan for personal and professional development to reach set objectives.*

CDWBL-506-1902: Work Based Learning II

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

Work-based learning is an instructional method that provides a direct link between work experience and college based learning. A key element in such experiences, is the development of critical thinking. The ability to think critically is fundamental and is sought after by employers in various sectors. Critical thinkers will approach and solve problems methodically rather than by intuition or instinct. Critical thinking is important because it helps individuals and teams more effectively diagnose problems and identify possible solutions that aren't entirely obvious at first. WBL exposes learners to real world environments in order to promote and develop critical thinking. Apprentices, particularly at degree level, are also expected to take initiative and propose solutions to different problems that are faced day to day in various workplace settings. Through their apprenticeship experience, learners are expected to develop strong problem solving skills and use particular incidents as learning opportunities.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Examine the significance of critical thinking in degree apprenticeships.*
2. *Discuss the role of critical reflection within an experiential learning cycle.*
3. *Apply the IDEALS approach to effective thinking and problem solving.*
4. *Evaluate critical incidents and compile a critical incident journal.*

ITMSD-506-1607: Game Level Design

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This is a skills based unit and will allow learners to demonstrate they have the necessary skills to be able to create a satisfying gaming experience by developing a deeper understanding of game design and the use of social and ethical context in which video games are developed, marketed and played. Learners will learn to analyse popular games from commonly used genres, examining from both form and functionality. The learners will apply game design concepts and principles to solve problems.

The Unit is relevant to learners wishing to further develop their knowledge of games as a tool to help provide them with informative knowledge on how to apply the skills learnt in their games. On completion of the Unit learners will understand how to produce games documentation that may be more technically complex in content and analysis, as well as developing the understanding, knowledge and skills required to produce them. This Unit will provide the Learner with the ability to use any type of game design and analyse it to be able to use the data extracted and apply it to any type of game genre. The learner will also be able to learn the impact of the games and how they affect their players, which will tie into the learners understanding of different types of players.

Learners will carry out formatting and presentation features to prepare their documentation for publication or sharing with other users which will prepare them to adapt to the game industry. This will therefore require learners to be confident in carrying out more advanced game types and deeper knowledge of player psychology, while applying different types of fundamental features in their game designs.

Finally learners should have the underpinning knowledge and understanding to check completed games and understand how to evaluate, understand the game mechanics behind it, solve the final outcome and also explain the core loop of the game

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Recognize the different types of games and recognize a Game Designer's role in the gaming industry.*
2. *Analyse the importance of understanding the target audience and the different designs applied to each.*
3. *Manipulate and plan game play using core mechanics present in games to adapt to targeted players by understanding how to achieve the "fun" element in a game.*
4. *Communicate and illustrate a game idea in full depth to be able to generate a game design document.*

ITMSD-506-1602: Sound Design

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit is designed to provide learners with the knowledge, understanding and skills involved in sound design for the games industry. It should be learner centred and lecturers should use discussion, both individual and group, for analysis of existing sound designs from a variety of software applications platforms. The learner will also acquire the underpinning knowledge of the properties and processes of sound, and the effects on sound with different settings applied. They will plan a sound production, using a sound editor to create their sound and present it as a final product for their chosen game.

Discussion and analysis should be integrated into structured tuition in techniques specific to software/hardware being used and also specific to sound design practice in a software application/multimedia setting. Learners will develop technical skills in the creation of audio files and will apply these skills in the creation of a finalized sound design for a game as well as learning how to use the hardware and software related to the production of a sound design.

Learners will be able to experiment and gain hands on experience of audio equipment and audio applications in the creation of a sound design which will also enhance their skills in critical thinking, planning, organisation and production. They can work as part of a team or individually in all aspects of the practical development and production of a sound design for a sound design brief. If working as a team each learner could be given a specific role within the team or alternatively, roles could be rotated. Each learner's role should be meaningful to the development and production of the sound design and the individual contribution of each learner must be apparent.

This Unit is suited to learners who have an interest, and may be considering a career, in the multimedia and software applications industry as well as the information technology industry. It would also suit learners who wish to enter the audio technology industry.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand the influence of sound and recognize the properties of digital audio.*
2. *Plan the acquisition of audio in accordance with a sound design brief for software applications.*
3. *Prepare a sound design project using a sound editor.*
4. *Produce a finalized audio track in accordance with a sound design brief.*

ITRSH-506-2101: Research Design I

Unit Level (MQF/EQF): 5
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

The purpose of this unit is to give the learner the necessary skills to start researching in an area of personal interest yet also of relevance to the area of studies and to the benefit of the local/regional community. This module differentiates itself from the rest in the manner that the criteria focus on how research is to be performed, whilst it is the learner who will determine the subject area and tools to be utilized to build the prototype necessary.

Therefore, this unit requires the learner to identity a theme such as the study of beach deterioration in local beaches, then through guidance, determine the sources of data (Satellite imagery) and tools needed to conduct such research. Every other learner will focus on areas that are either of personal interest, subject areas communicated by other researchers (potential future mentors), topics of funded projects, or recommendations by various parties such as key external partners. This unit will give a structure to how research is conducted in a scientific manner, following industry standards and common practice.

The fundamental objective of this unit is to introduce the learner to hypothesis testing. Therefore, after a theme is selected, a hypothesis needs to be formulated together with research questions. A research pipeline highlighting the methods to be used in order to address the research questions follows. A preliminary literature review will be undertaken by the researcher in order to familiarize themselves with the current state of the art and to justify key decisions made in their individual research.

The learner is expected to work on a proof-of-concept, prototype or working solution in order to gather the necessary data from research experiments so to be able to argue and answer the set research questions. Upon analysis and reflection, the learner should be in a position to understand what a scientific research process is, what is expected of him/her from a dissertation and how to undertake such a research endeavor at a larger scale as expected in the final dissertation.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Formulate a research hypothesis and research methodology.*
2. *Evaluate, after research, the current state of the art.*
3. *Evaluate project outcomes critically.*
4. *Report project outcomes and recommendations within a structured framework.*

ITMSD-606-1610: Sound Engineering

Unit Level (MQF/EQF): 6
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

This unit assumes that the students are already familiar with both sound design and game development.

In this course the students will learn concepts that are key in assisting a sound engineer during a sound project. Learners will embrace the concept of dynamic music and apply such techniques in their sound projects. This may involve the incorporation of several (smaller) sound projects that are blended together with sound effects to define the goals of a game. Such goals will be established by the use of a Digital Application Workstation (DAW), whereby it is assumed that learners already have prior knowledge about the basic aspects. Although learners would already have previous experience with a Digital Application Workstation(DAW), the unit still provides flexibility so that it is not linked to a specific DAW. For example, one may use Ableton Live or Prosonus Studio One in the creation and modification of sound projects.

The unit will start with a revision of Musical Instrument Digital Interface (MIDI)/Audio channels and effects in a DAW to ensure that all learns are on track with the required knowledge for this course.

A study of the frequency spectrum will follow where a number of frequency ranges are identified. Learners will understand the importance of each individual frequency range and its application in relation to a particular sound. Comprehension of gain amplification and reduction will enable learners to increase or decrease the amplitude of the particular waveform in that particular frequency range. Such knowledge can be applied with the use of Equalisation. Learners can therefore acquire know-how by applying Equalisation on sound.

Following topics include dynamic range compression and expansion and the use of plug-ins in a DAW. Compressors and Expanders in a DAW help empower the richness of an overall sound mix by defining certain sounds in the mix. The use of plug-ins in a DAW such as Virtual Studio Technologies (VSTs) enables learners to obtain a more realistic sound on a particular instrument.

Learner will apply the above tools via MIDI automation to achieve sound dynamics. The application of basic sound dynamics can be achieved by the use of MIDI automation.

Finally, the learner needs to identify and script the different stages in a game. An appropriate sound mini-project needs to adhere with the relevant game stage. For example, in a role-playing game if the player discovered a shortcut, higher-tempo matching music will reflect. Thus, an insight into interactive composition will allows learners to comprehend the various sound elements involved in dynamic music.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Demonstrate an understanding of audio and frequency response making use of equalisation in order to obtain a quality sounding overall mix.*
2. *Produce and configure audio, MIDI and auxiliary channels.*
3. *Implement sound improvements with an improved dynamic range that result in a superior audio quality.*
4. *Design and apply proper sound dynamics in a game.*

ITRSH-606-2102: Research Design II

Unit Level (MQF/EQF): 6
Credits: 6
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 150

Unit Description

The main focus of Research Design II unit is to help learners gain a more in-depth understanding of research design in ICT, thereby, enabling them to evaluate the different ways in which research may be conducted and to choose the approaches that most suit their goals based on already published research and academic theories.

Amongst the most important topics to be covered are the analysis of a hypothesis to better define the scope of a research and to clarify the aim and objectives of a research in view of an applied problem in a specific domain. Knowledge of different research approaches and testing strategies is also paramount; this will lead to the selection and justification of the most appropriate approaches/strategies for the chosen research based on sound academic theories and past research published through conference proceedings and journal articles. Such knowledge will provide the learners with the necessary know-how to present data gathered from results in a manner that is clear and effective for inferring patterns and developing sound and unbiased conclusions with regards to their hypothesis. Critical reflection upon decisions taken throughout the research journey, especially with regards to the chosen research approach, methodology and testing strategies is also an important aspect of this unit for evaluating one's own research in the light of future improvements.

The delivery of the unit should also capitalize on the opportunity to foster a collaborative research environment between learners where they can discuss their research ideas with each other, as peers, and provide constructive criticism/suggestions on how a research idea/approach can be improved. Sharing of knowledge, ideas, opinions and academic resources for carrying out such research is to be encouraged and viewed as an integral part of healthy academic discussion and knowledge sharing.

Proper presentation of the learner's own work carried out during research is also an important part of the unit; tools that support the management of references and the formatting of scientific documents to adhere to well known, pre-defined formats suitable for submission of papers for conference proceedings or articles in scientific journals will be explored.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Propose the most suitable methodology for a chosen research.*
2. *Analyse testing strategies used for validating a hypothesis.*
3. *Analyse collected data to arrive to findings and conclusions for a chosen research.*
4. *Produce scientific documents using appropriate writing styles, document formats and tools.*

CDKSK-503-1907: English I

Unit Level (MQF/EQF): 5
Credits: 3
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 75

Unit Description

This unit is intended to be run in the first semester of the first year of undergraduate degree programmes and consolidates prior knowledge, skills and competences in English reading, writing, listening and speaking by further strengthening the more academic functions of the language.

English I is intended to be an EAP (English for Academic Purposes), focusing specifically on improving learners' awareness of, and familiarity, with the core skills necessary for successful academic reading and writing in English, especially preparing them for the rigours of extended writing by research and the reading of academic sources of information.

Learners will become familiar with academic features of style and the principles and mechanics of good text structure. They will also learn how to consult, understand and use secondary material from academic sources within their field of study and effectively integrate it as part of a larger argument or body of work.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Recognise the form, content and style of academic texts;*
2. *Use an academic style of writing when working on assignments and dissertations;*
3. *Reproduce secondary content by means of direct and indirect quoting methods;*
4. *Apply proper referencing conventions when citing secondary content.*

CDKSK-503-1908: English II

Unit Level (MQF/EQF): 5
Credits: 3
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 75

Unit Description

This unit is intended to be run in the second semester of the second year of undergraduate degree programmes and consolidates prior knowledge, skills and competences of Academic English by further strengthening reading, writing, listening and speaking skills as determined by the rigours of pre-dissertation research.

English II is targeted at learners who have successfully completed their degree programme's first year and exposes undergraduate students to a higher level of critical reading and writing skills demanded in the second and final years of the degree programme. This usually involves the identification and select reading of academic texts, their review and their eventual use in a research proposal, dissertation and academic presentation.

It is also the objective of this unit to train learners to be more aware of, and proficient in, spoken Academic English as this becomes a key requirement at this level of studies.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Evaluate academic sources of information when working on own dissertation;*
2. *Produce texts of an academic nature using appropriate language and style;*
3. *Communicate verbally in a manner which conveys proficiency of the subject being researched;*
4. *Respond effectively to key questions in relation to research in own field.*

CDKSK-602-2105: Community Social Responsibility

Unit Level (MQF/EQF): 6
Credits: 2
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 50

Unit Description

This unit focuses on community and social responsibility skills and provides an opportunity for learners to better understand themselves and others, as well as establish goals in life. Community and social responsibility skills enable learners to understand their strengths and areas that need improvement while preparing them for life, employment and to become active citizens in society.

Moving away from traditional delivery of other units, learners will be empowered to take ownership of their learning process. Hence, this unit will be delivered through a combination of workshops, small-group sessions with mentors and various opportunities to reflect.

The first set of sessions will focus on the self, the ability to work independently and the important values in life. The second set of sessions will focus on working with others, dealing with diversity and conflicts. Furthermore, at the end of the sessions, learners will be introduced to the importance of active citizenship in life.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Identify personal goals through self-reflection.*
2. *Evaluate how collaboration with others can be more effective.*
3. *Explain the importance of giving and receiving feedback.*
4. *Contribute actively to make a difference in society.*

CDKSK-604-1909: Entrepreneurship

Unit Level (MQF/EQF): 6
Credits: 4
Delivery Mode: Fully Face-to-Face Learning
Total Learning Hours: 100

Unit Description

The working definition of '**entrepreneurship**' employed in this unit is that stated by the European Commission: "*Entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and taking calculated risk, as well as the ability to plan and manage projects in order to achieve objectives. This supports everyone in day-to-day life at home and in society, makes employees more aware of the context of their work and better able to seize opportunities, and provides a foundation for entrepreneurs establishing a social or commercial activity*" (Entrepreneurship in Vocational Education & Training, June 2009).

In line with this definition, the unit places an emphasis on fostering a mind-set that *entrepreneurship* is the vehicle that drives *creativity* and *innovation*. The learner will, amongst others, be encouraged to gain an insight as to how to investigate customer needs and markets to generate an innovative idea for a start-up; participate in the realistic simulation of the creation of a start-up[1]; create and pitch sections of a business plan, as well as draft sections of a business plan for an identified business idea.

The assessment of the unit is designed in a way to provide an opportunity for learners to strengthen transversal competencies which UNESCO highlights as necessary for the 21st century. These include intrapersonal skills, interpersonal skills, critical and innovative thinking, media and information literacy and global citizenship.

Learners with different backgrounds and experiences are required to contribute actively in a team to prepare the necessary work towards initiating a successful business venture.

[1] 'Doing effective entrepreneurship' is firmly grounded in theory, yet the *chalk and talk* delivery mode is not promoted in this unit. Rather, *actionable theory through practice* is strongly encouraged. *Realistic simulations*, limited not only to in-class activities such as *discussions* of the problems faced in the different phases of a business, especially in the process of commercialisation of innovative products and services, and *on-paper* creative management strategies, are considered essential.

In this unit, learners will become familiar not only with the main theories related to entrepreneurship and business start-ups but will have the opportunity to explore, interact and learn from a number of first-hand situations. The challenges of working with diverse team members will provide the learners not only with the possibility to look at entrepreneurship ideas from different perspectives, but also to come up with more creative, original and feasible solutions to challenges that will arise.

The practical and realistic element of the unit will allow learners to engage and interact with different stakeholders from industry and public institutions. This real-life interaction will provide the ideal set up to link theory with practice in the real world. Learners are encouraged to get out of their comfort zone and explore their entrepreneurial spirit by combining creativity, innovation and risk taking to help seize an opportunity, improve current situations or solve problems they encounter in the real world.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand the terms "entrepreneurship" and "entrepreneur" and techniques used to generate and evaluate business ideas;*
2. *Examine important considerations while developing a new business idea;*
3. *Apply business planning and control initiatives while developing a new business idea;*
4. *Contribute effectively in a team to develop a concept prototype of a feasible product/service idea.*