UNIVERSITY of TECHNOLOGY, MAURITIUS

School of Innovative Technologies and Engineering

Department of Industrial Systems Engineering & Department of Business Informatics and Software Engineering

Jointly with

Polytechnics Mauritius Ltd (PML)

Diploma in Emerging Technologies (Internet of Things)

Diploma in Emerging Technologies (Big Data)

PROGRAMME DOCUMENT

VERSION 1.0

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University of Technology, Mauritius
La Tour Koenig, Pointe aux Sables 11134, Mauritius
Tel: (230) 207 5250 *Fax:* (230) 234 1747 *Email:* site@umail.utm.ac.mu
website: www.utm.ac.mu

DIPLOMA IN EMERGING TECHNOLOGIES

A. PROGRAMME INFORMATION

This Diploma in Emerging Technologies programme is designed to give students a strong foundation within the technical themes of evolving technologies, namely, Programming languages, GUI Tools & Distributions, Artificial Intelligence, Internet of Things, Mobile technologies & networks, Big data, cloud computing, IT security, soft skills and team building. It is a programme with two specializations, namely, the Internet of Things and Big Data. The Diploma in Emerging Technologies (Internet of Things) provides students with a firm foundation for a successful career in technology development & innovation, with a specific focus on topics involving smart devices, IoT security & surveillance, and intelligent systems amongst others. On the other hand, the Diploma in Emerging Technologies (Big Data) will provide students with a variety of techniques used to retrieve and analyse data, and as well as process large, complex, and sometimes unstructured sets of information. The graduates can hence take up demanding, responsible and exciting positions in the rapidly expanding industries that are embarking on creating solutions using emerging technologies. Nowadays, Emerging Technologies are central to every industry which lead to creating more efficient ways to work, engaging ways to reach customers, and establishing powerful ways to communicate. The students will have the skills they need to succeed in the changing world of technology.

B. PROGRAMME AIMS

The aims of the programme are:

(i) to bridge the gap between available skills in the current labour market and industry requirements

(ii) to provide the diploma holders with the skills to prepare them for careers in the ICT environment with emphasis on solutions design, software development and technology infrastructure support.

Employment Prospects

There are many and varied career opportunities for Diploma holders in the fields of emerging technologies in this evolving industry in Mauritius. Due to the global nature of this field, there are also career opportunities in other parts of the World. Possible jobs include IT programmer, Server Operator, Computer Technician, Network Technician, Technical Assistant, Helpdesk officer, etc.

In addition, the programme can also lead to further studies such as the UTM's Top-up BSc (Hons) Emerging Technologies programme.

C. PROGRAMME OBJECTIVES

After successful completion of the Diploma in Emerging Technologies programme, the graduates will have an efficient understanding of the key concepts and applications evolving in the area of computing, making them a valuable asset to the industry.

Upon completion of the programme, the graduates would have the ability:

(i) to solve computing problems by applying their knowledge from the programme

(ii) to develop and conduct appropriate applications to process and interpret data, and draw conclusions in specific environments

(iii) to develop applications, namely in the areas of Networking, Artificial Intelligence, and Cloud computing with a focus on the Internet of Things and Big Data using an emerging development platform (like Python).

PART I

REGULATIONS

D. GENERAL ENTRY REQUIREMENTS

To consider the Programme Entry Requirements.

E. PROGRAMME ENTRY REQUIREMENTS

Five (5) credits at Ordinary level inclusive of a credit or equivalent grade in English and inclusive of a credit or equivalent grade in either Mathematics or Physics or Computer Science, or an alternative qualification acceptable to the APL/APEL committee

OR

Two (2) subjects at Advanced Level inclusive of either Mathematics or Physics or Computer Science or any other equivalent qualification acceptable to the APL/APEL committee.

Note: In addition to the above requirements, prior to the start of the diploma programme, the students will be required to follow a preparatory course of two weeks to equip them with the fundamental prerequisite skills (e.g. soft skills, mathematics fundamentals, etc.).

F. PROGRAMME MODE AND DURATION

Full-Time: Minimum 2 years (4 semesters) and Maximum 4 years (8 semesters)

Part-Time: Minimum 3 years (6 semesters) and Maximum 5 years (10 semesters)

G. TEACHING AND LEARNING STRATEGIES

In general, for this programme, modules will be conducted via face-to-face mode. However, to cater for the impact of the COVID-19 pandemic and other similar situations, and matters connected, consequential, or related, the course may be run either via online or blended modes. The student would be expected to perform a substantial amount of self-learning both for the theoretical and practical parts of the modules and adopt a research-oriented approach, as far as possible.

To summarise, teaching and learning activities may include

- Lectures (L), Tutorials (T) and Practical (P) sessions
- Class Tests and Assignments
- Participating in quiz-based exercises
- Workshops / Seminars / Lab Sessions
- Industry visits so that students may observe company cultures and may network with industry professionals
- Structured Discussions & Self Development Study (SD)
- Case Study materials & scenarios.

H. STUDENT SUPPORT AND GUIDANCE

- Academic tutoring and Counselling: Group tutorials or individual tutorials are arranged for students upon request.
- Supervision of mini-projects, group assignments, and system design projects.

I. ATTENDANCE REQUIREMENTS

As per PML's Regulations and Policy.

J. CREDIT SYSTEM

This programme is aligned with the European Credit and Transfer System (ECTS). The programme promotes a unified procedure for academic recognition of study periods performed. The system introduces standards for assessment and comparison of study levels in various academic institutions and enables to recognition of diplomas at the European job market. ECTS credits are assigned to each module in the programme amounting to 60 credits for each level.

For each level, on average there will be 1500 hours of learning. One module is worth 6 credits and will carry 150 hours of learning to comprise 45 hours of delivery which could be any combination of face-to-face, blended, online, seminar, workshop, or joint session. The remaining 105 hours will cover self-learning, self-study, guest lecture, etc. The Diploma Project is assigned 6 credits.

K. STUDENT PROGRESS AND ASSESSMENT

For the award of the degree, all modules must be passed overall with passes in the examinations, coursework, and other forms of assessment. All modules will carry 100 marks and will be assessed as follows (unless otherwise specified):

(i) Written examinations will carry a weightage of 60% unless otherwise specified

(ii) Continuous assessment will normally carry a weightage of 40% unless otherwise specified

(iii) Continuous assessment for the following specific modules (Electronic Circuits and Communication, Python Programming Methodology 1 & 2, Soft Skills, Building Internet of Things, R Big Data Analytics and architecture, Dynamic Web Platform on Chip for IoTs, Artificial Intelligence with Machine Learning Techniques, Big Data Querying and Analytics) shall be 100% of the total marks. Continuous assessment can be based on a combination of assignments, field studies, workshops, and class tests

(iv) The overall pass mark for a module is 40%.

Grading

Grade	Marks x (%)
A	$x \geq 70$
B	$60 \leq x < 70$
C	$50 \leq x < 60$
D	$40 \leq x < 50$
F	$x < 40$
A - D	Pass
F	Referred

L. EVALUATION OF PERFORMANCE

1. The percentage mark at Level 1 contributes a 40% weighting towards the Diploma classification.
2. The percentage mark at Level 2 contributes a 60% weighting towards the Diploma classification.

M. AWARD CLASSIFICATION

Overall weighted mark y (%)	Classification
$y \geq 70$	Diploma with Distinction
$40 \leq y < 70$	Diploma
$y < 40$	No Award

For the award of a Diploma, a total of 120 credits is required. Students who fail to qualify for the award of the Diploma will be awarded a Certificate in Information Technology provided that they obtain a minimum of 60 credits.

N. PROGRAMME ORGANISATION AND MANAGEMENT

Contact Details : Tel: 207-5250 Fax: 234-1767

Email: site@umail.utm.ac.mu or contact@poly.ac.mu

O. PROGRAMME STRUCTURE (Full-Time)

YEAR 1 (Level 1 – 60 Credits)							
Semester 1				***Semester 2***			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
MATH1103C	Decision Mathematics	3+7	6	DET1204C	Database Design and Implementation	3+7	6
BNET1102C	Python Programming Methodology 1	3+7	6	BNET1207C	Python Programming Methodology 2	3+7	6
DET1101C	Electronic Circuits and Communication	3+7	6	DET1205C	Internet of Things Design Principles	3+7	6
DET1102C	Computer Architecture and Operating Systems	3+7	6	DET1206C	Big Data Architecture and Programming	3+7	6
DET1103C	Soft Skills	3+7	6	BNET1210C	Network Technologies and Design	3+7	6

TRACK 1: Specialisation in Internet of Things (IoT)

YEAR 2 (Level 2 – 60 Credits)							
Semester 1				***Semester 2***			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
DET2101C	Work Placement	Refer to table below	6	DET2207C	Artificial Intelligence with Machine Learning Techniques	3+7	6
DET2102C	Foundation of Artificial Intelligence and Machine Learning	3+7	6	DET2208C	Mobile Communication System Architecture	3+7	6
DET2103C	Computer Law and Cyber Security	3+7	6	DET2209C	Cloud Computing and Techniques	3+7	6
DET2104C	Analysis and Design in Practice	3+7	6	DET2210C	Dynamic Web Platform on Chip for IoTs	3+7	6
DET2105C	Building Internet of Things	3+7	6	DET2012C	System Design Project	-	6

TRACK 2: Specialisation in Big Data

YEAR 2 (Level 2 – 60 Credits)							
Semester 1				***Semester 2***			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
DET2101C	Work Placement	Refer to table below	6	DET2207C	Artificial Intelligence with Machine Learning Techniques	3+7	6
DET2102C	Foundation of Artificial Intelligence and Machine Learning	3+7	6	DET2208C	Mobile Communication System Architecture	3+7	6
DET2103C	Analysis and Design in Practice	3+7	6	DET2209C	Cloud Computing and Techniques	3+7	6
DET2104C	Computer Law and Cyber Security	3+7	6	DET2211C	Big Data Querying and Analytics	3+7	6
DET2106C	R Big Data Analytics and architecture	3+7	6	DET2012C	System Design Project	-	6

LEVEL 2 ACTIVITY			
Code	**Activity**	**Duration**	**Deliverables**
DET2101C	Work Placement	18-Week training in the industry starting after the Year 1 Semester 2 Examinations	Compulsory Submission of a Portfolio upon completion with Viva (6 credits)

P. PROGRAMME STRUCTURE (Part-Time)

YEAR 1 (Level 1 – 42 Credits)							
Semester 1				*Semester 2*			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
MATH1103C	Decision Mathematics	3+7	6	DET1103C	Soft Skills	3+7	6
BNET1102C	Python Programming Methodology 1	3+7	6	DET1204C	Database Design and Implementation	3+7	6
DET1101C	Electronic Circuits and Communication	3+7	6	BNET1207C	Python Programming Methodology 2	3+7	6
DET1102C	Computer Architecture and Operating Systems	3+7	6				
→ Start of Level 1							

YEAR 2 (Level 1 – 18 Credits)							
	Semester 3						
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**				
DET1205C	Internet of Things Design Principles	3+7	6				
DET1206C	Big Data Architecture and Programming	3+7	6				
BNET1210C	Network Technologies and Design	3+7	6				
End of Level 1→							

TRACK 1: Specialisation in Internet of Things (IoT)

YEAR 2 (Level 2 – 18 Credits)				YEAR 3 (Level 2 – 24 Credits)			
Semester 1				*Semester 2*			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
DET2101C	Work Placement	Refer to table below	6	DET2104C	Analysis and Design in Practice	3+7	6
DET2102C	Foundation of Artificial Intelligence and Machine Learning	3+7	6	DET2105C	Building Internet of Things	3+7	6
DET2103C	Computer Law and Cyber Security	3+7	6	DET2207C	Artificial Intelligence with Machine Learning Techniques	3+7	6
				DET2208C	Mobile Communication System Architecture	3+7	6
→ Start of Level 2							

YEAR 3 (Level 2 – 18 Credits)							
	Semester 3						
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**				
DET2209C	Cloud Computing and Techniques	3+7	6				
DET2210C	Dynamic Web Platform on Chip for IoTs	3+7	6				
DET2012C	System Design Project	-	6				
			End of Level 2→				

TRACK 2: Specialisation in Big Data

YEAR 2 (Level 2 – 18 Credits)				YEAR 3 (Level 2 – 24 Credits)			
Semester 1				***Semester 2***			
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**	**Code**	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**
DET2101C	Work Placement	Refer to table below	6	DET2104C	Analysis and Design in Practice	3+7	6
DET2102C	Foundation of Artificial Intelligence and Machine Learning	3+7	6	DET2106C	R Big Data Analytics and architecture	3+7	6
DET2103C	Computer Law and Cyber Security	3+7	6	DET2207C	Artificial Intelligence with Machine Learning Techniques	3+7	6
				DET2208C	Mobile Communication System Architecture	3+7	6
→ Start of Level 2							

YEAR 3 (Level 2 – 18 Credits)							
	Semester 3						
Code	**Modules**	**Hrs/Wk** L/T/P+SD	**Credits**				
DET2209C	Cloud Computing and Techniques	3+7	6				
DET2211C	Big Data Querying and Analytics	3+7	6				
DET2012C	System Design Project	-	6				
			End of Level 2→				

LEVEL 2 ACTIVITY			
Code	**Activity**	**Duration**	**Deliverables**
DET2101C	Work Placement	Mini Projects for 18 weeks with industry starting after the Year 2 Semester 3 Examinations	Compulsory Submission of a Portfolio upon completion with Viva (6 credits)

Total Number of ECTS Credits = 120.

Total Number of ECTS Hours = 2700 (excluding the number of hours spent to complete the work placement and Capstone project).

The first version (Version 1.0) was approved and launched in October 2021.