Module Synopsis

Diploma in Infocomm & Digital Media (Applied Artificial Intelligence & Analytics)

MC 1:	Modular Certificate in Computing Fundamentals	(180 hours)

1. SP-IT8211: Fundamentals of Programming (Python) (60 hours)

The module aims to help students pick up a programming language (Python) and learn how to solve and automate tasks through programming. Students will be taught programming fundamentals such as variables, data types, operators, control structures, methods and data structures such as arrays. At the end of the module, students will be competent in using programming for problem solving.

2. SP-IT8212: Discrete Structures (60 hours)

This module aims to equip students with foundational mathematical knowledge in linear quantitative modelling, computational logic, combinatorial and probabilistic reasoning essential for today's data-driven roles. You will learn to:

- Structure information: Explore matrices and number systems to organise and interpret data.
- Understand the language of computers: Dive into set theory, logic, and Boolean algebra to understand how digital systems process information fundamentally.
- Make calculated decisions: Apply probability and counting methods to support decision-making.

Students will apply critical and creative thinking to solve assignment and application tutorial problems.

3. SP-IT8213: AI-Assisted UI Development (60 hours)

The module aims to equip students with the knowledge and skills in developing effective front-end web applications using Hypertext Markup Language (HTML) and Cascading Stylesheets (CSS). Students will learn to use front-end web development frameworks to further enhance their ability for rapid prototyping responsive web application. Students will also gain proficiency in AI-powered development tools to augment their ability to design, prototype and generate code efficiently in modern front-end workflows.

MC 2:	Modular Certificate in Data Analytics	(180 hours)

1. SP-IT8214: Python for Data Analytics (60 hours) (60 hours)

Provides students with fundamental skills to develop applications that retrieve, manipulate, process, and analyse data using the Python programming language. Students will learn to code in Python and understand key concepts such as exploratory data analysis. They will also perform data analysis using libraries such as NumPy, Pandas, Matplotlib, and Seaborn to derive meaningful insights that support business decision-making.

2.	**SP-IT8215: Python for Data Science**	**(60 hours)**

Provides students with foundational data science competencies using the Python programming language. This module encompasses key applied mathematical principles, including hypothesis testing and probability, to address contemporary business challenges. Students will utilise essential data science libraries to perform data manipulation, statistical analysis, and data visualisation. The module places strong emphasis on formulating and investigating fundamental research questions in data science, thereby equipping students with the analytical capabilities required to solve increasingly complex problems.

3.	**SP-IT8216: Back-End Web Development**	**(60 hours)**

This module provides participants with the techniques and skills required for server-side web development using Python flask. The module will review the basic database Create, Retrieve, Update, Delete (CRUD) operations and examine the Representational state transfer (REST) concepts. At the end of the module, participants will be able to build and configure a backend server using the python flask framework, as well as a RESTful Application Programming Interface for the front-end to access backend services.

MC 3:	**Modular Certificate in Data Engineering & Machine Learning**	**(180 hours)**
1.	**SP-IT8217: Data Engineering**	**(90 hours)**

This module aims to cover the fundamental concepts to build and work with data pipelines. Students are taught how to work with relational database, non-relational (NoSQL) database, and large data stores such as data warehouses and how to integrate data from multiple data sources into a single repository using Extract, Transform and Load (ETL) workflows.

2.	**SP-IT8218: AI & Machine Learning**	**(90 hours)**

The module aims to provide students with hands-on experience in building applications that use machine learning and neural networks. The students will also learn skills to build intelligent agents, such as Chatbots and integrate cognitive service APIs to add intelligence into their applications.

MC 4:	**Modular Certificate in AI Algorithms & Deep Learning**	**(180 hours)**
1.	**SP-IT8219: Data Structures & Algorithms (AI)**	**(90 hours)**

This module aims to teach students advanced Object-Oriented concepts and data structures and algorithms using Python. Through this module, students will learn how to implement stacks, queues, linked lists, dictionaries and solve problems using these data structures. Algorithms to improve code efficiency and search will also be taught.

2.	**SP-IT8220: Deep Learning**	**(90 hours)**

This module aims to teach students deep neural network architectures and its practical applications. Students will learn to frame problems and prepare machine trainable datasets. They will apply deep learning frameworks such as Tensorflow, Keras, and PyTorch, to train deep learning models. Eventually, students will create and train their own deep learning models in various applications such as image recognition using convolutional neural networks, natural language processing using recurrent neural networks, creative deep learning using generative AI, as well as problem solving using reinforcement learning.

MC 5:	**Modular Certificate in Visual Analytics & AI Operations**	**(180 hours)**
1.	**SP-IT8221: Data Visualisation**	**(60 hours)**

This module aims to equip students with techniques for creating impactful reports and interactive dashboards, enabling organisations to extract deeper insights from their business data. Students will learn best practices for developing effective data visualisations using popular industry tools such as Tableau and Python. By the end of this module, students will be proficient in building and deploying comprehensive visual reporting solutions that drive informed business decisions.

2.	**SP-IT8222: Industry Certification Preparation**	**(45 hours)**

This module is designed to prepare students for industry-endorsed artificial intelligence certification examinations by equipping them with the required technical knowledge, practical skills, and exam-readiness strategies aligned with current industry standards.

Through structured learning activities, guided practice, and independent study, students will consolidate key AI concepts, tools, and methodologies commonly assessed in professional certification exams. The module emphasises self-directed learning, applied understanding, and familiarity with certification exam formats, enabling students to build confidence and competence in preparation for external assessment.

3.	**SP-IT8223: Agile MLOps**	**(75 hours)**

Provides students with an overview of Agile methodologies and Machine Learning Operations (MLOps) to enhance the efficiency and reliability of machine learning (ML) project development and delivery. It covers essential practices for planning ML project using the Agile framework, managing data and ML models, developing ML applications with continuous integration and deployment, and monitoring of ML models in the production environment. Students will learn Agile project management, MLOps and Container tools and gain hands-on experience in automating workflows to build robust machine learning projects.