ANNEX A

LIST OF NEW AI PROGRAMMES BY INSTITUTES OF HIGHER LEARNING

Republic Polytechnic	**Specialist Diploma in Applied Generative Artificial Intelligence** ***(Comprising two micro-credentials listed below)*** Participants will be guided through the fundamentals of AI such as machine learning, deep learning, and neural networks, before delving into the innovative realm of generative models such as Generative Adversarial Networks, Variational Autoencoders and Stable Diffusion. Participants will also gain a deep understanding of the ethical challenges in AI development and learn to develop AI systems with ethical considerations in mind. By the end of this course, participants will have the knowledge and skills to implement AI solutions and create generative AI models that can produce original content.
	Post-Diploma Certificate in Applied Artificial Intelligence (Micro-Credential stackable to Specialist Diploma in Applied Generative Artificial Intelligence), which consists of the following modules**:** <u>Programming for Artificial Intelligence</u> Participants will be equipped with the fundamentals of programming using Python. Students will learn how to solve problems through coding a software program. Fundamentals on software structure, variables, selection, and iteration constructs will be covered. Students will be able to create software to solve simple programming problems related to AI. <u>Machine Learning Fundamentals</u> Participants will be taught basic concepts in machine learning and the use of various open-source libraries like scikit-learn, Tensorflow and Keras to build basic machine learning application with perceptron, *K* nearest neighbors and neural networks. Students will also be introduced to XGBoost and other ensemble methods to solve classification and regression problems. <u>Deep Learning Fundamentals</u> Participants will be introduced to key topics associated with deep learning. This module will cover the fundamental underpinnings of

	Artificial Neural Networks (ANN), Convolution Neural Networks (CNN), Recurrent Neural Networks (RNN) and Long-Short Term Memory (LSTM) networks, and the fundamentals will be supported with practical work that involves participants developing and deploying an ANN, CNN, RNN, and LSTM.
	Post-Diploma Certificate in Generative Artificial Intelligence (Micro-Credential stackable to Specialist Diploma in Applied Generative Artificial Intelligence), which consists of the following modules**:** <u>Developing Ethical AI Systems: Data Values and Process</u> Participants will be introduced to open-source data platforms and frameworks for storing large data volumes, as well as an overview of machine learning pipeline which includes data management, high-throughput model training/evaluation, and real-time data processing. Participants will examine ethical/legal issues in AI using basic reasoning frameworks and principles, with a focus on privacy and data protection. Additionally, participants will be taught AI project management methodologies such as agile development, resource planning, and risk management tailored for AI projects. Concepts of explainable AI and model governance are also introduced to ensure transparency, fairness, and compliance of AI systems. <u>Vision Models for Generative AI Applications</u> Participants will journey through the world of vision models. Starting with the basics, participants will be shown how such models learn from images before diving into how these models can be tweaked to make them even better by using tools such as AWS and Nvidia. Through hands-on experience, participants will learn how to fine-tune these models for tasks like recognising what is in a picture and even teaching the model to create its own images. The module is designed to be interactive and practical, giving participants the skills needed to use these vision models effectively in the exciting world of generative AI. <u>Large Language Models for Generative AI Applications</u> Participants will delve into the technicalities of Large Language Models (LLMs), with an emphasis on the application of LLMs in text-driven AI tasks. Starting with an insight into model training, the course intensifies its focus on fine-tuning these models for specific tasks such as text generation or summarisation using tools such as AWS and Nvidia. Participants will gain a practical

	understanding of adjusting and deploying LLMs through hands-on sessions that involve fine-tuning parameters and mastering deployment techniques.
Singapore Management University Academy	**(SkillsFuture Career Transition Programme) Advanced Certificate in Generative AI for Business Analysts** Through a combination of theoretical learning and practical applications, participants will gain a robust understanding of how to leverage these advanced AI tools to drive efficiency and generate comprehensive, actionable insights. By the end of the programme, participants will be equipped with the necessary skills to harness the potential of generative AI, enabling them to make data-driven decisions and implement strategies that enhance business performance across various sectors. This programme is designed to prepare business analysts to meet the demands of a rapidly evolving digital landscape, ensuring they can effectively utilise AI technologies to gain a competitive edge.
	(SkillsFuture Career Transition Programme) Advanced Certificate in Generative AI for Digital Marketing Specialists Participants will be equipped with the knowledge and skills needed to leverage generative AI tools for optimising workflows and boosting efficiency within the realm of digital marketing. By the end of the programme, they will gain a strong foundation in digital marketing principles and the transformative applications of generative AI, enabling them to perform efficiently through streamlining tasks, automating processes, and elevating their overall digital marketing endeavours.
Singapore Polytechnic	**Building Customised Generative AI Applications on Enterprise Data** Participants will be equipped with skills and techniques in Generative AI that are needed to effectively use existing no-code technology platforms. Participants will come up with an end-to-end solution and build their own Large Language Models (LLM) powered chatbot, which will allow participants to leverage on their own domain-specific knowledge and harness the power of LLM to interact with their own enterprise data in a customised manner.
	Machine Learning Using ChatGPT for Manufacturing Industry Participants will have a thorough understanding in using Chat Generative Pre-Trained Transformer (ChatGPT) to seek real-time assistance for equipment and processes issues, develop

	interactive training modules to train new employees on their manufacturing processes and gain quick access to relevant documentation, manuals, and best practices.
Singapore University of Social Sciences and Singapore University of Technology & Design	**Professional Certification on Industry Applications of Generative AI** This joint certification between Singapore University of Social Sciences and Singapore University of Technology & Design will equip professionals with essential skills to leverage Generative AI to foster job innovation, productivity, and optimisation across industries through three modules: Module 1 – "Introduction to Generative Artificial Intelligence," provides foundational knowledge of theories and practical applications. Module 2 – "Generative AI for Design," focuses on integrating AI into professional workflows. Module 3 – "Harnessing Generative AI for Compelling Storytelling & Content Creation," explores AI's role in innovative communication strategies. This certification by SUSS and SUTD enables professionals to excel in Generative AI, fostering job innovation, productivity, and optimisation.