O2 - GEN. AI & BUSINESS PRODUCTIVITY
(Operational Level-1)

INTRODUCTION

This program provides a structured, end-to-end pathway from **AI foundations to practical Generative AI usage, including prompt engineering, chatbot development without programming,** and a **business-focused case study and project.** Learners first build core literacy in AI concepts (problem solving, probabilistic reasoning, machine learning, neural networks, and societal implications), then progress to applied GenAI tools and capabilities, and finally consolidate skills through hands-on work and an industry-oriented project.

OBJECTIVE

By the end of the program, participants will be able to:

1. **Build AI literacy** by understanding what AI is, how AI systems solve problems, and where AI is used in real-world settings.
2. **Develop foundational ML understanding** including machine learning types, basic classification/regression concepts, and neural network fundamentals.
3. **Gain working knowledge of Generative AI**—its capabilities, evolution, and where it adds value in business and professional workflows.
4. **Apply prompt engineering systematically** using prompt patterns and few-shot approaches to improve output quality, reliability, and usability.
5. **Create a chatbot solution without programming** by working with intents, entities, dialog, deployment, and operational chatbot components.
6. **Translate learning into business impact** through case study analysis and a guided project (banking sector context in the appendix).

LEARNING OUTCOMES

After completing the program, learners will be able to:

- **Define AI and its related fields** and explain key perspectives such as AI philosophy and implications.
- **Describe AI problem-solving approaches**, including search-based reasoning and game/problem search intuition at a conceptual level.
- **Explain real-world AI reasoning basics**, including probability intuition and Bayes-rule driven thinking as presented in the foundational component.
- **Differentiate major machine learning types** and relate them to common tasks (e.g., nearest neighbor classification and regression).
- **Explain neural network fundamentals** and describe how neural networks are built, including an awareness of advanced techniques at a high level.
- **Identify practical GenAI use-cases and tools** for text, image, audio/video, and code generation, and perform at least one hands-on application.
- **Construct effective prompts using patterns**, including refinement, verifier/cognitive patterns, persona patterns, and structured formats (including multi-pattern combinations).
- **Use few-shot examples appropriately** and apply structured prompting concepts included in the prompt engineering module (e.g., intermediate-step prompting and action-oriented examples).
- **Design and assemble a no-code chatbot** using intents, entities, dialog, deployment, and operational features such as context variables/slots and digression handling.
- **Deliver a case study and project output** demonstrating business productivity impact and a practical GenAI deployment concept (banking sector emphasis).

SYLLABUS CONTENTS

Weightage

- PART - A: 40%
- PART - B: 10%
- PART - C: 20%
- PART - D: 10%
- PART - E: 10%
- PART - F: 10%
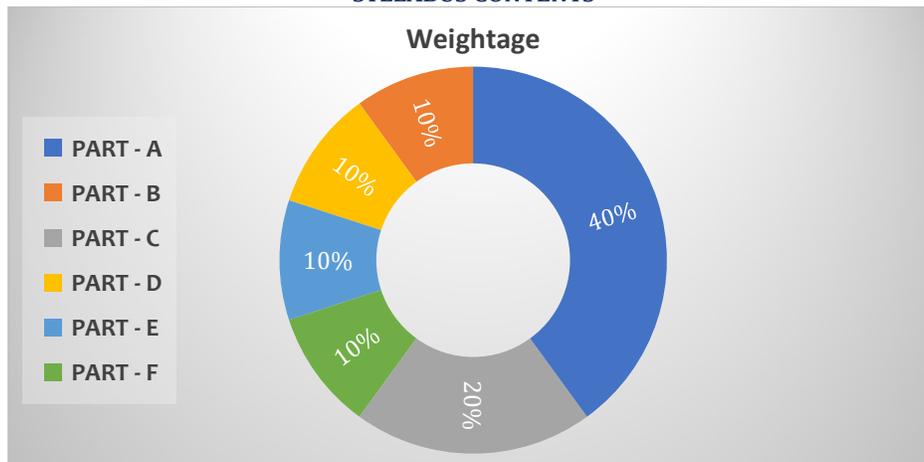
PART A:
ELEMENTS OF AI

1. What is AI?
- How should we define AI?
- Related fields
- Philosophy of AI

2. AI problem solving
- Search and problem solving
- Solving problems with AI
- Search and games

3. Real world AI
- Odds and probability
- The Bayes rule
- Naive Bayes classification

4. Machine learning
- The types of machine learning
- The nearest neighbor classifier
- Regression

5. Neural networks
- Neural network basics
- How neural networks are built
- Advanced neural network techniques

6. Implications
- About predicting the future
- The societal implications of AI
- Summary

PART B:
GEN-AI: INTRODUCTION & APPLICATIONS

7. Introduction and Capabilities of Generative AI
- Generative AI Fundamentals Specialization Introduction
- Introduction to Generative AI
- Capabilities of Generative AI
- History and Evolution of Generative AI

8. Applications and Tools of Generative AI
- Applications of Generative AI
- Tools for Text Generation
- Tools for Image Generation
- Tools for Audio & Video Generation
- Tools for Code Generation
- Hands on Lab

9. Course Quiz, Project, and Wrap-up
- Final Project: Generating Text, Images and Code

PART C:
PROMPT ENGINEERING FOR ChatGPT

10. Course Introduction
- Overview of the Course
- Motivating Example: Act as a Speech Pathologist

- What are Large Language Models?
- Randomness in Output

11. Introduction to Prompts, Prompts Patterns
- What is a Prompt?
- Intuition Behind Prompts
- Prompt Patterns
- Prompt Size Limitations
- Prompts are a Tool for Repeated Use
- Root Prompts

12. Prompts Patterns I
- Question Refinement Pattern
- Cognitive Verifier Pattern
- Audience Persona Pattern
- Flipped Interaction Pattern
- Format of the Question Refinement Pattern
- Format of the Cognitive Verifier Pattern
- Format of the Audience Persona Pattern
- Format of the Flipped Interaction Pattern

13. Few-shots Example
- Few-shot Examples
- Few-shot Examples for Actions
- Few-Shot Examples with Intermediate Steps
- Writing Effective Few-Shot Examples
- Chain of Thought Prompting
- React Prompting
- Using Large Language Models to Grade Each Other

14. Prompts Patterns II
- Game Play Pattern
- Template Pattern
- Meta Language Creation Pattern
- Recipe Pattern
- Alternative Approaches Pattern
- Format of the Game Play Pattern
- Format of the Template Pattern
- Format of the Meta Language Creation Pattern
- Format of the Recipe Pattern
- Format of the Alternative Approaches Pattern

15. Prompts Patterns III
- Ask for Input Pattern
- Combining Patterns
- Outline Expansion Pattern
- Menu Actions Pattern
- Fact Check List Pattern
- Tail Generation Pattern
- Semantic Filter Pattern
- Course Conclusion & Thank You
- Format of the Ask for Input Pattern
- Format of the Outline Expansion Pattern
- Format of the Menu Actions Pattern
- Format of the Fact Check List Pattern
- Format of the Semantic Filter Pattern

PART D:
ETHICAL AI

16.Introduction to Ethical AI
- Historical Context & Evolution
- Defining the Tech
- The Ethical Dimension

17. Key Principles of Ethical AI
- The Core Pillars
- Ethical Decision-Making

18. AI Tools Discovery
- Tool Exploration
- Selection Strategy
- Personal Repository

19. Ethical Prompt Engineering
- Case Studies
- User-Centred Approaches
- Content Crafting Goals

20. Living with AI: Challenges & Opportunities
- The New Landscape
- Workforce Evolution
- Future Readiness

PART E:
BUILDING AI-POWERED CHATBOTS WITHOUT PROGRAMMING

21. Introduction to chatbots
- Create an IBM Cloud Account
- Create an Instance of New Watson assistant

22. Working with intents
- Create intents
- Import intents

23. Entities
- Working with entities
- Create entities
- Import & export entities

24. Dialog
- Putting it all together
- Building user friendly chatbots
- Implement the dialog

25. Deployment
- Deploying a WordPress Site
- Generate a WordPress Site
- Deploy our chatbot

26. Context Variables & slots
- Working with context variables and slots
- Hands-on Lab

27. Digressions
- Understanding Digressions
- Watson Assistant in the private cloud
- Hands-on Lab

28. Watson Actions
- Watson actions
- Activating dialogs
- Migrating dialog skills
- Migrating intents and entities

PART F:
CASE STUDY & PROJECT
- Case Study: Gen-AI in the banking sector
- Project: Banking sector AI deployment

LEARNING CONTENT PROVIDERS

PART	TOPIC	LEARNING CONTENT PROVIDER
A	Elements of AI	University Of Helsinki
B	Generative AI: Introduction & Applications	IBM
C	Prompt Engineering for ChatGPT	Vanderbilt University
D	Ethical AI	Cambridge University
E	Building AI-Powered Chatbots without Programming	IBM
F	Case Study & Project Work	ICMA Digital