Lesson Plan — "Understanding Context Engineering through Applied Prompting"

Module: 6 – Context Engineering
Duration: 90 minutes

Learning Objectives

By the end of this session, participants will be able to:

- Explain the purpose of context engineering in shaping LLM responses.
- Apply techniques such as instruction layering, contextual priming, and retrieval-augmented generation (RAG).
- Design an effective multi-layered prompt using role, format, and reference context.
- Critically evaluate how contextual cues influence AI-generated outputs.

Activities

1. **Mini Lecture (15 min)** – Instructor or digital twin *"Leo"* introduces the concept of context engineering, showing examples of simple vs. engineered prompts using visual slides from the Jupyter Book.
2. **Hands-On Prompting (30 min)** –
    - Students use ChatGPT or Claude to experiment with prompt layering.
    - They start with a simple query (e.g., "Summarize this report") and gradually add context (role, format, reference material) to observe changes in results.
3. **RAG Simulation (20 min)** –
    - Learners simulate Retrieval-Augmented Generation by first crafting a question, then retrieving a factual paragraph from a public report (e.g., WHO or GAO).
    - They paste this paragraph into the prompt to enhance factual grounding and compare outputs with and without retrieval context.
4. **Reflection & Discussion (20 min)** –

    - Groups discuss: *What changed as context increased?*
    - Each team identifies one effective and one misleading contextual element.
    - Insights are summarized on a collaborative whiteboard.
5. **Wrap-Up (5 min)** – Instructor highlights best practices for designing context-rich interactions and provides a checklist for ethical, transparent prompt use.

Tools

- ChatGPT, Claude, or Gemini (for prompting experiments)
- Jupyter Book "Context Engineering"
- Miro or Jamboard (for reflection and mapping prompt evolution)

Assessment

- **Formative:** Group reflection posts on Canvas comparing initial vs. context-engineered outputs.
- **Summative:** Individual submission of a *"Context Evolution Table"* including three prompt versions (base, layered, RAG-augmented) with short commentary.

Instructor Notes

- Encourage learners to treat context as *design*, not *decoration*.
- Use at least one example connected to real FGCU or Dendritic use cases (e.g., lesson planning or research summarization).
- Emphasize ethical and transparent AI prompting (e.g., citing sources retrieved through RAG).