EXECUTIVE SUMMARY

I was able to demonstrate my skills in prompt engineering to generate content for my topic of choice “Innovative use of sensors and actuators” by using different LLMs such as chatGPT, POE AI, Microsoft Co-Pilot, and Gemini. So as to make the best prompts that would give me the best outputs, I used prompt tools to optimize my prompts. In comparison to my personal prompts, the optimized prompts were more detailed and thus helped me achieve the best outputs and engaging e-learning content. Furthermore, after receiving outputs from the optimized prompts, I used the outputs to further optimize my prompts and used the revised prompts to get a more clear, less ambiguous and engaging content. From this outputs, I was able to make a choice of the best content generated that is more detailed and created presentations for it. For the presentation, I used Microsoft Co-Pilot to help create visual learning aids such as pictures and graphs to help learners in understanding the content. Microsoft Co-Pilot produced the best pictures from the prompts.
This whole work is explained in details below:

STEPS FOLLOWED IN THE ASSIGNMENT

1. Selection of my topic of choice - Innovative use of sensors and Actuators.

2. I created 3 prompts that I would use to generate content on my topic of choice.

I used 3 LLMs namely, ChatGPT, POE AI and Microsoft Co-pilot. The prompts for the different LLMs were as follows: [This are my personal/human prompts]

a. ChatGPT - I am a prompt engineer creating an engaging e-learning content on "innovative use of sensors and actuators". I am trying to create content for slide presentations. For the topic "Innovative use of sensors and actuators", create the following: Outline containing Topics Each Topic should have Subtopics Each Sub-Topic should have Learning Objectives where the learning objectives have some content for slides/presentations in form of narration or explanation text.

b. POE AI - I am a prompt engineer creating an engaging e-learning content on "innovative use of sensors and actuators". I am trying to create content for slide presentations. For the topic "Innovative use of sensors and actuators", create the following: Outline containing: Topics, Each Topic should have Subtopics, Each Sub-Topic should have Learning Objectives, where the learning objectives have some contents for slides/ presentations in form of narration or explanation text.

c. Microsoft Co-Pilot - I am a prompt engineer creating an engaging e-learning content on "innovative use of sensors and actuators". I am trying to create content for slide presentations. For the topic "Innovative use of sensors and actuators", create the

following: Outline containing; Topics,Each Topic should have Subtopics Each Sub-Topic should have Learning Objectives where the learning objectives have some contents for slides/presentations in form of narration or explanation text.

In the 3 prompts for the 3 LLMS, Chatgpt, POE AI, and Microsoft Co-pilot, I used my formula for prompt priming called a perfect prompt where;
Perfect prompt = [context] + [specific information] + [Intent] + [Response format]
This formula helped me in creating prompts that are clear, engaging and aim to achieve specific learning objectives.

3. I was able to optimize my prompt for ChatGpt using different optimizing tools such as;

   Prompt perfect, Prompt Layer, Junia Prompt generator as shown in the link here and got the prompts as shared in the links below;
   a. Prompt perfect prompt here
   b. Prompt layer prompt here
   c. Junia prompt generator here
   d. Furthermore, the prompts are shown in the spreadsheet here

   Generally, these prompt optimizers helped me a great deal in coming up with better prompts for LLMS that were more detailed, more clear, more specific, more engaging and would help me generate a better output. Furthermore, as a user, I was able to compare different prompt output side by side and make a decision on the best prompt provided.

4. Using the optimized prompts above, I was able to use the following LLMs at random to generate the course content; ChatGPT, POE AI, Microsoft Co-Pilot and Gemini
   I was able to come up with 4 sample prompt outputs where I randomly used prompts from the following tools respectively;
   a. ChatGPT prompt output here (Prompt from prompt perfect)
   b. POE AI prompt output here (Prompt from Prompt layer)
   c. Microsoft Co-pilot prompt output here (Prompt from Junia Prompt generator)
   d. Gemini.prompt output here (Prompt from prompt perfect)
   e. This spreadsheet link here shows the combination of prompt, LLM used and analysis of differences of outputs based on LLMs used showing strengths and weaknesses of each output.

   For all the 3 prompts I was able to use a few-shots prompting to generate the contents. Furthermore, I was able to utilize a chain of thoughts for the 3 prompts because the

outputs were without visual learning aids such as images, infographics,animations or videos. Although only ChatGPT was able to Generate me

5. Based on my outputs on the prompts made, I adjusted my prompts to improve the following in my outputs:
    a. improve clarity,
    b. reduce ambiguity, and
    c. enhance engagement

Therefore, by feeding prompting tools with the obtained outputs above (4 above), I was able to request for prompts that would make the content generated more clear, less ambiguous and enhance learner engagement.
I was able to get revised prompts as follows;

a. Revised Prompt Perfect prompt here
b. Revised Prompt Layer prompt here
c. Revised Junia Prompt Generator here
d. Furthermore, you can all the 3 revised prompts in the spreadsheet here

Using the above revised prompts, I was able to prompt the respective LLMs with respective prompts as done on step 4 to get the following outputs;

a. ChatGPT revised prompt output here
b. POE AI revised prompt output here
c. Microsoft Co-Pilot revised prompt output here
d. Gemini revised prompt output here
e. Furthermore, find the combined LLM outputs from revised prompts in the spreadsheet here

I was able to document changes in content generated using revised prompts from LLM outputs and content generated from initially optimized prompts using respective LLMs to compare differences in both contents as shown below.

LLM used	Output from optimzed prompt	Output from revised output	Documented changeS & Improvements
ChatGPT	here	here	HERE
POE AI	here	here	
Microsoft Co-Pilot	here	here	
Gemini AI	here	here	

6. Finally I was able to prepare a slide presentation using google slides for the most optimized outputs.
My choice of the most optimized output is that generated by ChatGPT.
Images for the presentation were generated using MicroSoft co-pilot LLM because unlike chatGPT, it has no limit to the number of image prompts that can be made at a go.
Link to the image prompts made is here
Link to the presentation is attached here