Instructor: Ajay Bandi

Course Number: 44599

Course Title: Special Topics: Generative AI

Course Description: Design chatbots, present innovative tools using generative AI, assess strengths and risks, and key AI models. Understand OpenAI's capabilities, ethical prompts, and real-world applications. Navigate security and compliance, culminating in a significant final project.

Prerequisites: Must complete 44242 or 44542

Textbook: No required textbook. Articles and materials will be provided on Northwest Online.

Student learning outcomes:

1. Design, implement, chatbots using generative AI models.
2. Present generative tools for prescribed tasks as a team.
3. Assess strengths, weaknesses, benefits, and risks of generative AI models.
4. Understand Variational Autoencoders, Transformers, GANs, and Large Language Models.
5. Familiarity with OpenAI models, including ChatGPT, and customization options.
6. Develop effective prompts, optimize performance, and apply ethical considerations.
7. Execute a significant generative AI project, showcasing practical application.
8. Identify and address security risks, privacy challenges, and compliance in generative AI.
9. Navigate legal and ethical considerations relevant to generative AI deployment.

Modules:

1. Introduction to Generative AI
    - Define Generative AI
    - Explain how Generative AI works.
    - Describe Generative AI input and output formats.
    - Explore Generative AI Applications
2. Generative AI Models and Architectures
    - Variational Autoencoders (VAEs)
    - Transformers
    - Generative Adversarial Networks (GANs)
    - Large Language Models (LLMs)
3. ChatGPT and OpenAI Models
4. AI-based Chatbots
    - Tools for creating AI-based chatbots.
    - Practical implementation of chatbots
5. Prompt Engineering with Generative AI
    - Creating effective prompts
    - Evaluating prompt performance
    - Ethical considerations

    - Best practices for using prompts.
6. Security Risks and Privacy Concerns using Generative AI
    - Data validation and privacy concerns
    - Remediations for security and privacy concerns
    - Regulations and compliance in Generative AI
7. Final project

Grading Criteria:

Grading Component	Points
Assignments	100
Presentations	100
Threaded Discussions	100
Final Project	100
Miscellaneous	0 – 25
Total	400 – 425