

NORTHWEST MISSOURI STATE UNIVERSITY

MARYVILLE | KANSAS CITY

School of Computer Science and Information Systems 44599 - 01 : Generative Al

Credit hours - 3hours Fall 2024

Instructor: Dr. Ajay Bandi **Office hrs:** MW – 9:30 am to 10:00 am MWF – 2pm to 4:00 pm Email: ajay@nwmissouri.edu Office: 2250 Colden Hall

Prerequisites: Senior or graduate standing

Textbook and supplementary materials: No textbook is required; all the materials will be posted in Northwest Online.

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.

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.

Assessment methods: Scores on class participation, discussions.

Instructional methods: Instructional methods include lectures, practical demonstration, classroom practice, class projects, and interactive question and answer sessions.

Refer to Syllabus Addendum for additional information

rev 10/2023

Graded course requirements:

Grading Component	Points
Assignments/Threaded discussions	150-200
Paper	100
Final Project	100
Miscellaneous	0 - 25
Total	350 - 425

The class will meet during the final exam time as specified by the registrar's office at https://www.nwmissouri.edu/registrar/finals.htm

Grading scale:

Graduate Credit (44-599)	
Percent Range	Grade
90 - 100%	А
>= 80% and < 90%	В
>= 70% and < 80%	С
>= 60% and < 70%	D
below 60%	F

Course outline/major topics studied:

- 1. Introduction to Generative AI
 - **Define Generative Al**

- 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. Al-based Chatbots
 - Tools for creating AI-based chatbots.
 - Practical implementation of chatbots
- 5. Prompt Engineering with Generative Al
 - 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

Note: Course schedule is subject to change with instructor notification and students will be responsible for abiding by these changes.

Attendance: This course will have many in-class activities, so attendance is strongly recommended. Some in-class exercises may have points associated with them and may not be announced in advance. A student who misses such an exercise due to an unexcused absence will not be allowed to make it up and will receive a zero. For an absence to be excused, written documentation must be provided and approved by the instructor abided by the MS-ACS attendance procedure. Excused absences include attendance at a university-sponsored event (documented with an excuse signed by the university sponsor prior to the event) or by circumstances considered adequately extenuating by the course instructor. It is the responsibility of the student to promptly notify his or her instructor when unable to attend class. Please refer to the university policy on attendance at https://www.nwmissouri.edu/policies/academics/Attendance.pdf

Refer to Syllabus Addendum for additional information