Institute of English Studies
Faculty of Arts and Humanities
University of the Punjab, Lahore.
Course Outline

Programme	BS Geography	**Course Code**	GEOG-311	**Credit Hours**	3
Course Title	Introduction to Artificial Intelligence (AI)				

Course Introduction

This course introduces students to modern Artificial Intelligence tools and applications used for academic and professional productivity. Students learn how to use generative AI systems such as ChatGPT, Claude, Gemini, Copilot, Perplexity AI, and NotebookLM to improve research, writing, analysis, creativity, and communication. The course covers the conceptual foundations of AI, ML, and Generative AI, moves through prompt engineering, speech and visual AI, and AI-assisted data analytics, and concludes with a discipline-specific capstone project. Throughout, the course emphasizes responsible use of AI, verification of AI-generated information, and integration of AI tools into real, discipline-specific academic workflows.

Learning Outcomes

On completion of the course, the students will be able to:

1. Identify and select appropriate generative AI tools for academic and professional tasks.
2. Construct effective prompts to generate reliable and relevant AI outputs.
3. Critically evaluate AI-generated content for accuracy, bias, and reliability.
4. Integrate AI tools into discipline-specific academic workflows.
5. Use AI tools to create study materials, presentations, and research summaries.
6. Understand ethical and academic integrity considerations when using AI.

	Course Content	**Assignments/Readings**
Week 1	**Unit I: Introduction to AI – Concepts and Paradigms** 1.1 Definitions and scope of Artificial Intelligence 1.2 Distinctions among AI, ML, DL, Generative AI, and Agentic AI 1.3 Narrow AI vs. General AI; historical development of AI	Read Chapter 1 of Artificial Intelligence Basics (Taulli); explore ChatGPT, Claude, Gemini for a first hands-on session
Week 2	**Unit I (Continued)** 1.4 Fundamentals of AI system operation: training vs. inference 1.5 Learning paradigms: supervised and unsupervised learning 1.6 Categories of AI tasks: classification, regression, clustering, generation 1.7 Examples of modern AI systems in medicine, imaging, chatbots and code generation	Assignment: Identify and describe three real-world AI applications relevant to your own field of study
Week 3	**Unit II: Fundamental Components of AI Systems and Learning Mechanisms** 2.1 Role of data, algorithms, and computational resources 2.2 Data types, dataset construction, and data quality 2.3 Feature engineering, pattern recognition, and knowledge representation 2.4 Introduction to neural networks	Write a short note on how data quality affects AI system performance
Week 4	**Unit II (Continued)** 2.5 Neural network architectures (conceptual overview) 2.6 Model training, optimization	Class discussion on the difference between traditional AI and Generative AI

	techniques, and feedback mechanisms 2.7 Overfitting, generalization, and strategies for model improvement 2.8 Generative AI and Agentic AI: autonomous, goal-directed systems	
Week 5	**Unit III: Large Language Models – Concepts, Tools, and Applications** 3.1 Concept and functioning of Large Language Models (LLMs) 3.2 Practical applications of LLMs in communication and knowledge work 3.3 Contemporary AI tools and platforms: ChatGPT, Claude, Gemini, GitHub Copilot, Perplexity AI, NotebookLM	Lab activity: Use two different chatbots for the same writing/brainstorming task and compare outputs
Week 6	**Unit III (Continued)** 3.4 Introduction to multimodal AI capabilities (text, image, audio, video) 3.5 Methods for evaluating and comparing AI-generated outputs 3.6 AI-supported learning tools (study guides, flashcards) and AI-enabled research workflows	Lab activity: Use Perplexity AI/Copilot for research and fact-checking a cited claim
Week 7	**Unit IV: Prompt Engineering and Effective AI Interaction** 4.1 Principles and techniques of prompt engineering 4.2 Components of structured prompts: role, task, context, constraints, output format, tone 4.3 Iterative refinement and domain-specific prompt design 4.4 Developing reusable prompt templates for standardized workflows	Assignment: Design and test three structured prompt templates for a task in your discipline
Week 8	**MID TERM EXAMINATIONS**	
Week 9	**Unit V: Introduction to Speech Processing with AI** 5.1 Fundamentals of audio signal processing for AI 5.2 Speech data preparation, labeling, and quality considerations 5.3 Overview of Text-to-Speech (TTS) and Speech-to-Text (STT) systems 5.4 Emerging tools: OpenAI Whisper, Google Speech-to-Text, Mozilla TTS	Write a note on the difference between supervised learning approaches for speech recognition
Week 10	**Unit VI: AI for Visual Content and Multimedia Creation** 6.1 Enhancing creativity and visual storytelling using AI 6.2 Generating images, graphics, and visual designs; prompt engineering for image generation 6.3 AI tools for multimedia: Gamma.app, Plus AI, Canva Magic Studio	Lab activity: Generate a slide deck or infographic from notes using an AI presentation tool
Week 11	**Unit VII: AI-Assisted Data Analytics** 7.1 Understanding data: structured, semi-structured, and unstructured 7.2 AI-assisted data preparation:	Lab activity: Use an AI tool to clean and summarize a small dataset

	cleaning, transformation, and feature extraction 7.3 AI-assisted spreadsheet analysis and information synthesis across documents	
Week 12	**Unit VII (Continued)** 7.4 Automation of analytical workflows using AI tools 7.5 Automated generation of visualizations and analytical summaries 7.6 Use of AI for decision support; limitations and risks of AI-generated insights	Conduct a comparative study on AI-assisted vs. manual data analysis
Week 13	**Unit VIII: Ethics and Academic Integrity in AI** 8.1 Uncertainty, bias, and hallucinations in AI systems 8.2 Dependence on training data and contextual limitations 8.3 Privacy and copyright considerations; responsible use of AI 8.4 AI content verification strategies; misinformation and data responsibility	Write a note on academic integrity considerations when using AI in coursework
Week 14	**Unit IX:Societal Impact and Future of AI** 9.1 Environmental and societal impact of large-scale AI systems 9.2 Impact of AI on the future of work and emerging professional skills 9.3 Collaboration between human intelligence and AI-assisted creativity 9.4 Real-world applications of AI in healthcare, business, education, and government	Group discussion on the future of work in an AI-driven economy
Week 15	**Unit X: Discipline-Specific AI Tool Integration & Capstone Project** 10.1 AI tool integration across various fields 10.2 Capstone Project: applying AI tools and techniques to a cohesive, real-world, discipline-specific project	Capstone Project: integrate AI-assisted text, visuals, audio, and data analytics into a unified deliverable
Week 16	**END TERM EXAMINATION (Capstone Project Submission & Presentation)**	

Textbooks and Reading Material

- Taulli, T. Artificial Intelligence Basics. Apress.
- Ng, A. AI for Everyone (Course). DeepLearning.AI / Coursera.
- Vermaat, M., Shaffer, J., & Freund, S. Discovering Computers. Cengage.
- Evans, A., Martin, K., & Poatsy, M. A. Technology in Action. Pearson.

Teaching Learning Strategies

- Interactive lectures and demonstrations of AI tools
- Hands-on lab sessions using generative AI platforms
- Guided prompt-engineering exercises
- Class discussions and group work
- Case studies of AI applications across disciplines
- Capstone project with presentation

Assignments: Types and Number with Calendar

Two assignments, one before midterms and one after midterm, to be submitted.