THE UNIVERSITY OF TEXAS AT EL PASO
College of Education- Department of Teacher Education

Title of Course: STEM 5300/TED 6319 (18354/18275) – Foundations of Generative Artificial Intelligence in Education	**Credits:** 3
Semester: Fall 2025	**Instructor Information:** **Professor:** Dr. David J. Carrejo, Ph.D. **Office:** College of Education, EDUC 802 **Phone:** 915-747-5856 **E-mail:** dcarrejo@utep.edu **(best means of contact)** **Office Hours: By appointment (online or F2F)**
Class meeting time: 8/25/25 – 10/13/25 Class meeting place: Online asynchronous	

This syllabus is subject to change as needed. Any changes to the syllabus will be announced in class and on Blackboard.

I. Course Description:

This introductory course will unveil the history of generative AI. It will explore the differences between generative AI and traditional AI, as well as its potential to transform education. Students will gain a solid understanding of the concepts behind generative models and how generative knowledge is constructed. Students will be able to 1) explain the essence of generative AI and its inner workings, 2) critically assess the strengths and limitations of this technology, and 3) develop a well-informed perspective on the future impact of generative AI on teaching and learning. The course will also emphasize the importance of responsible AI practices by exploring the ethical and legal frameworks that ensure fairness, transparency, and accountability in AI development and deployment, ultimately prioritizing human well-being in the context of education.

II. Course Objectives

1) Explain the core concepts and mechanisms behind generative AI, distinguishing it from traditional AI and articulating its unique capabilities and potential in the field of education.
2) Describe the historical development of generative AI, recognizing key milestones, breakthroughs, and influential figures who have shaped the field.
3) Demonstrate a comprehensive understanding of various generative models and their underlying principles.

4) Explain how generative AI models acquire, represent, and generate new knowledge.

III. Student Learning Outcomes

1) Explain the historical development of generative AI and its relevance to the educational field.
2) Distinguish between traditional AI and generative AI approaches in the context of education.
3) Analyze the potential of generative AI to personalize learning experiences and cater to diverse learning styles.
4) Describe how generative AI can be used to create educational content (e.g., practice problems, simulations).
5) Discuss the role of generative knowledge in fostering creativity and critical thinking skills in students.
6) Critically evaluate the ethical considerations surrounding the use of generative AI in education, such as bias and student privacy.
7) Analyze the potential challenges and limitations of implementing generative AI in educational settings.
8) Present well-supported arguments on the future impact of generative AI on the teaching and learning landscape.

IV. Learning Modules:

This course features a modular format, where each week is packaged as a single module, containing all materials, lecture notes, submission areas, and discussion posts in one location for that week.

V. Readings

AI Index Steering Committee, et al. (2024). *Artificial Intelligence Index Report 2024*. Stanford University, Institute for Human-Centered AI (HAI). https://aiindex.stanford.edu/report/

Bozkurt, A., Xiao, J., Lambert, S., et al. (2023). Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI): A collective reflection from the educational landscape. *Asian Journal of Distance Education*, *18*(1), 53-130. https://doi.org/10.5281/zenodo.7636568

Chen, B., Xinran Zhu, X., & Díaz del Castillo F.H. (2023). Integrating generative AI in knowledge building. *Computers and Education: Artificial Intelligence*, *5*, open access, https://doi.org/10.1016/j.caeai.2023.100184

Haber, E., Jemielniak, D., Kurasinski, A., & Przegalińska, A. (2025). *Using AI in academic writing and research: A complete guide to effective and ethical academic AI.* Palgrave Macmillan. https://link.springer.com/book/10.1007/978-3-031-91705-9

Mao, J., Chen, B. & Liu, J.C. Generative Artificial Intelligence in Education and Its Implications for Assessment. *TechTrends* **68**, 58–66 (2024). https://doi.org/10.1007/s11528-023-00911-4

Ng, D.T.K., Lee, M., Tan, R.J.Y. *et al.* (2023). A review of AI teaching and learning from 2000 to 2020. *Education and Information Technologies, 28*, 8445–8501. https://doi.org/10.1007/s10639-022-11491-w

Ooi, K. B., Tan, G. W. H., Al-Emran, et al. (2023). The potential of generative artificial intelligence across disciplines: perspectives and future directions. *Journal of Computer Information Systems*, 1–32. https://doi.org/10.1080/08874417.2023.2261010

Popenici, S.A.D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, *12*(22), 1 – 13. https://doi.org/10.1186/s41039-017-0062-8

Any supplemental readings, class handouts, and online resources will be provided through Blackboard Ultra. You MUST have a valid UTEP login and password to access my.utep.edu, Blackboard Ultra, and many other relevant UTEP websites. A UTEP e-mail address is required for all e-correspondence and more effective communication.

VI. Technology Requirements

Course content is delivered online through the Blackboard learning management system. Ensure your UTEP email account is functioning properly and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the recommended browsers for Blackboard; other browsers may cause compatibility issues. When experiencing technical difficulties, try updating your browser, clearing your cache, or switching to a different browser. You will need to have access to a computer or laptop and a scanner (which may be an app on your smartphone). You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Ensure that your computer hardware and software are up to date and capable of accessing all parts of the course. If you do not have word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook, and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about Microsoft Office 365 and follow the instructions.

VII. Inclusiveness and Equity

Learning happens only when we feel respected as a whole human being. My top priority in our classroom is to cultivate relationships of trust and respect and a sense that we see each other as whole, complex human beings. That you experience this in our classroom is important for the sake of your learning in our course *and* for the sake of your future students' learning so that you feel able to cultivate such relationships with them. To that end, I want you to know that all of you is welcome in our classroom space—all the parts of you as a person are welcome in our discussions, our activities, our assignments, and in our assessments. We are all complex people with a variety of perspectives, experiences, challenges, assets, and resources—our gender identities, our sexual orientations, our religions, our races, our ethnicities, our economic statuses, our immigration statuses, our parenthoods, our veteran statuses, our ages, our languages, our abilities, and disabilities. All aspects

of you are welcome in our learning community to the extent that you feel comfortable sharing them. I strive to show respect for the variety and wholeness in each of you, and I expect that each of you shows respect for each other as well. If you feel marginalized in our class and would like to discuss it, I would appreciate your input so that I can support you, protect you, and make changes that promote a more inclusive and equitable environment. You can also talk with our Department Chair, and/or you can report a complaint of discrimination to the University's Equal Opportunity Office, Kelly Hall, Third Floor, 915-747-5662 or eoaa@utep.edu.

VIII. Standards of Academic Integrity

Students are expected to uphold the highest standards of academic integrity. Any form of scholastic dishonesty is an affront to the pursuit of knowledge and compromises the quality of the degree awarded to all UTEP graduates. Any student who commits an act of academic dishonesty is subject to disciplinary action. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, any act designed to give an unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.

IX. COVID-19 Precautions

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please notify me as soon as possible so that we can arrange suitable accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing. The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way Miners can take care of Miners is to get vaccinated. If you still need the vaccine, it is widely available in the El Paso area and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org

X. Students with Disabilities Statement

If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Center for Accommodations and Support Services (CASS) located in Union E, Room 106. Students who have been designated as having a disability must reactivate their standing with CASS on a yearly basis. Failure to report to this office will result in a student being placed on the inactive list and will nullify any benefits received. If you have a condition that may affect your ability to exit safely from the premises in an emergency or that may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of CASS. You may call 915-747-5148 for general information about the Americans with Disabilities Act (ADA).

XI. Evaluation & Coursework Requirements of Students:

Coursework Requirements	Points
Discussion Boards – 5 x 20 pts	100
Paper Proposal	20
Final Paper	80
TOTAL	200

How Grades are Determined	
Grade	**Percentage (%)**
A	90 - 100
B	80 - 89.9
C	70 - 79.9
D	60 - 69.9
F	Below 60

XII. Course Assignments

1. **Discussion Boards:** Over the semester, you will be asked to synthesize the weekly readings and integrate your thoughts into the online discussions. At several points throughout the course (please refer to the calendar), you will prepare a written response (minimum of 500 words) to a question that will be posted on Blackboard. Each initial response must be substantive, demonstrating critical thinking and using examples or quotes from the assigned readings.

   Your initial post is due by the end of the week it is assigned. You are also required to respond to at least two of your classmates. Your replies should be substantive, offering a new perspective, a question to consider, or a differing viewpoint based on the concepts and theories discussed. Timely submission of your initial post and replies is essential for a rich and interactive online discussion.

2. **Paper Proposal:** This assignment is designed to help you plan and structure your final paper. You will submit a research proposal outlining your original investigation into the use or impact of generative AI in an education domain.

   Your proposal should include:

   1. **A clearly articulated research question.**
   2. **A brief overview of your theoretical framework** or the core concepts that will guide your paper.
   3. **A preliminary methodology or plan** for how you will approach your research (e.g., case study, historical analysis).
   4. **A list of at least three key sources** you plan to use, with a brief explanation of how each will support your paper.

   This proposal serves as the first step toward your final paper and will provide you with valuable feedback to guide your writing and research for the rest of the course.

3. **Final Paper:** You will craft an original research paper (approximately 8-10 pages) that showcases your understanding of the key themes and theories from our study of Generative AI. This paper is

the culminating project for the course. It builds directly on your Paper Proposal, incorporating feedback you received from your instructor and peers to refine your research question and methodology.

You have the freedom to select one of the following prompts to guide your research and shape your paper:

a) **Historical Analysis & Future Trends:** Select a specific domain within education (e.g., STEM, Biliteracy, Leadership, etc.). Trace the historical evolution of generative AI applications within this domain and critically analyze current trends.
b) **Model Deep Dive:** Choose a specific generative AI model used in education and provide an in-depth analysis of its underlying principles, strengths, and limitations.
c) **Ethical & Responsible AI:** Explore a specific ethical challenge associated with the use of generative AI in education (e.g., bias in data, algorithmic transparency). Propose concrete solutions and strategies to address this challenge.
d) **Generative AI in Action: Case Study:** Conduct a case study analysis of a specific implementation of generative AI in an educational setting. Evaluate its effectiveness, impact on learning outcomes, and any ethical or practical challenges encountered.
e) **Original Research Proposal:** Develop a research proposal outlining an original investigation into the use or impact of generative AI in an education domain. Clearly articulate your research question, theoretical framework, methodology, and expected outcomes.

Your final paper is due in Week 8.

XIII. Course Requirements

1. Participation

Your active participation are crucial for your success in this course and for the collaborative learning environment we will build. This class is designed to be collegial, and your contributions are essential to your group's efforts and our collective understanding of generative AI and its impacts on education.

2. Digital Citizenship and Professional Conduct

In this course, we are a learning community, and your active engagement is vital. Whether we meet face-to-face or online, professional conduct is expected at all times. This includes completing all assignments on time, contributing thoughtfully to discussions, and interacting with your classmates and me with professional courtesy. This is a safe space for open discussion and creative expression, so all information should be kept confidential. When participating in online discussions, please address ideas, not people, and avoid inappropriate language or texting shortcuts. Your posts should demonstrate a high level of academic writing. Late work will not be accepted, so please manage your time carefully. In the case of an extreme emergency, you must contact me ahead of time to discuss a potential exception. If a technical

issue with the learning management system prevents you from submitting work on time, you must immediately email me your work as an attachment to receive credit.

3. **Accessibility to Your Instructor**

   I am here to support you in this course and want you to succeed. My email is the best way to reach me for questions or to schedule a meeting. You can expect a response from me within 24-48 hours. If you ever have difficulty understanding the course material or my expectations, please be proactive and contact me as soon as possible. Do not wait until the last minute. The sooner you reach out, the sooner we can work together to find a solution and ensure this class is a success for you.

4. **Due dates**

   Assignments are due on the specified dates. Type or word-process written assignments. All assignments should be double-spaced with a 12-point font. Number your pages.

5. **Calendar changes**

   The schedule of topics and reading assignments may change over the semester. Any changes to the syllabus will be announced in class. Every student is responsible for these changes.

XIV. Class Schedule: Please note that the schedule below is subject to change.

DATE	TOPIC	ASSIGNMENTS
Week 1 **August 25**	• Introduction to Generative AI	**History of AI research using AI**
Week 2 **September 1**	• Models and Knowledge	**Readings:** Chen et al. (2023); Ng et al. (2023) **Discussion 1 due**
Week 3 **September 8**	• Applications and Ethical Considerations	**Readings:** Bozkurt, et al. (2023); Popenici & Kerr (2017) **Discussion 2 due**
Week 4 **September 15**	• Crafting Your Paper Proposal	**Discussion 3 due**
Week 5 **September 22**	• Assessment and Future Trends	**Reading:** Mao, et al. (2024) **Paper Proposal due** **Discussion 4 due**
Week 6 **September 29**	• Your Original Paper	**Reading:** Haber, et al. (2025) **Discussion 5 due**
Week 7 **October 6**	• The Frontiers of Generative AI	**Readings:** Ooi, et al. (2023); AI Index Steering Committee, et al. (2024).
Week 8 **October 13**	**Final Paper Submission**	

XV. Course Curriculum Map

Course Objectives	Student Learning Outcomes	Readings & Assignments
Objective 1: Explain the core concepts and mechanisms behind generative AI, distinguishing it from traditional AI...	Outcome 2: Distinguish between traditional AI and generative AI approaches in the context of education.	Readings: Popenici & Kerr (2017); Chen, et al. (2023)
	Outcome 3: Analyze the potential of generative AI to personalize learning experiences and cater to diverse learning styles.	Readings: Ng, et al. (2023); Bozkurt, et al. (2023) Assignments: Discussions 2 & 3
Objective 2: Describe the historical development of generative AI...	Outcome 1: Explain the historical development of generative AI and its relevance to the educational field.	Reading: Popenici & Kerr (2017) Assignment: Discussion 1
Objective 3: Demonstrate a comprehensive understanding of various generative models...	Outcome 4: Describe how generative AI can be used to create educational content.	Readings: Chen, et al. (2023); Haber, et al. (2025) Assignment: Discussion 3
Objective 4: Explain how generative AI models acquire, represent, and generate new knowledge.	Outcome 5: Discuss the role of generative knowledge in fostering creativity and critical thinking skills in students.	Readings: Bozkurt, et al. (2023); Ooi, et al. (2023) Assignment: Discussion 4
	Outcome 6: Critically evaluate the ethical considerations surrounding the use of generative AI...	Readings: Haber, et al. (2025); Mao, et al. (2024) Assignments: Paper Proposal; Final Paper
	Outcome 7: Analyze the potential challenges and limitations of implementing generative AI in educational settings.	Readings: Mao, et al. (2024); Ooi, et al. (2023) Assignments: Paper Proposal; Final Paper
	Outcome 8: Present well-supported arguments on the future impact of generative AI...	Reading: Ooi, et al. (2023); AI Index Steering Committee (2024) Assignments: Final Paper; Discussion 5
All Objectives	All Outcomes	Final Paper: The final paper is the culminating assignment that requires students to synthesize all course objectives and learning outcomes into a comprehensive research paper.