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Mathematics/MAT 301
Calculus I

AI Across the Curriculum - Summer 2024 Bootcamp
Faculty Showcase

Incorporating AI Learning into MAT 301 Calculus I

The AI learning goals for my course are:

- Help students understand the ethical and responsible use of AI.
- Incorporate AI tools to review and improve Students' Python Assignments.
- Help students Identify AI as a tutor (assistant)

I have added at the end of my syllabus for Fall 2024 the following

About the use of Artificial Intelligence (AI)

This semester, we will introduce and pilot the responsible use of AI in our Calculus class.

As part of this course, you will independently complete the IBM SkillsBuild AI Ethics course online. Upon finishing, you will receive a certificate of completion from IBM and earn one point towards your final grade.

During week 4 I will spent the first 45 minutes of my lecture doing the following

•I will begin with a brief introduction to AI, explaining what it is and how it works.
•I will highlight some common examples of AI applications (e.g., virtual assistants like Chatgpt, Gemini, and Copilot).
•I will give my students three assignments on-line via BRIGHTSPACE.

AI Lesson Plan

Learning Objectives

Upon completion of this Lesson, students will be able to:

- Understand the ethical and responsible use of AI.
- Incorporate AI tools to review and improve their Python Assignments.
- Identify AI as a tutor (assistant) that can help them to successfully go through their Python assignments.

Students will be given the following assignments

Assignment 1: In your own words, you do not have to be formal, write down examples of the use of AI on your daily life.

Assignment 2: In your own words write a short reflection on how AI affects your daily routines and how you feel about its presence in your live.

Assignment 3: Click on the link below, create an account on IBM SkillsBuild and go over the AI ETHICS activity, when you finish you will be given an IBM certificate of completion.

https://skills.yourlearning.ibm.com/activity/MDL-220

Submit your Certificate of completion on BRIGHSPACE on the section “Certificate of completion”.

Link of my AI Lesson Plan

AI Lesson Plan Assessment Rubric

The Python Lab assignments which are part of my Calculus class will be designed such that my students will follow the principles of Computational Thinking.

With the infusion of AI into my Calculus Class my students will have a way to review and improve their python lab assignments.

Rubric: Students will earn 1 point towards their final grade for completing the AI Ethics activity and uploading their certificates of completion on BRIGHTSPACE.

AI Lesson Plan- CRP

In my calculus lesson using AI, I'm incorporating Culturally Responsive Pedagogy by fostering a welcoming environment where AI can answer student questions in english, spanish and other common languages. Calculus can sometimes feel abstract, so via the infusion of AI I can bring real-world examples that connect to Climate change, population growth rate in New York city and other issues related to the students' lives. AI caters to diverse learning styles by offering explanations in text, audio, and video formats. Additionally, students can adjust the difficulty level of practice problems generated by AI and receive hints tailored to their mistakes, personalizing the learning experience.

Describe AI Policy for the course

AI Use Guidelines for MAT 301-1800 Calculus I

This semester, we will introduce and pilot the responsible use of AI in our Calculus class.

Purpose: AI supports learning in Calculus I.

Guidelines:

- AI assists with practice and explanations.
- Students must integrate AI insights responsibly.
- Prohibit using AI independently for assessments.

Ethics:

- Attribute AI-generated content when used.
- Protect student privacy and data.

Implementation: Instructor will provide guidance on AI use.

Link of my AI Policy for my Calculus class

Using GenAI in your classes (Positive Use Case)

In a Calculus I class, students often encounter challenging concepts that require additional explanation and practice. Generative AI can be used as a supplementary resource to provide detailed explanations, step-by-step solutions, and alternative approaches to understanding difficult topics.
For example if a student is struggling with the concept of the chain rule for differentiation, they can ask ChatGPT "Can you explain the chain rule in calculus and provide an example?" ChatGPT might respond "The chain rule is a formula for computing the derivative of the composition of two or more functions. If you have two functions, g(x) and f(u), where u=g(x), the derivative of the composition f(g(x)) is given by: (fog)’(x)=f’(g(x))g’(x). Here is a step by step example: …”

Using GenAI in your classes (Negative Use Case)

In a Calculus I class, a student could misuse generative AI by asking it to solve homework problems or even complete entire assignments for them. For instance, instead of working through a complex calculus problem and understanding the underlying concepts, a student might simply input the problem into ChatGPT and receive the solution instantly. This not only undermines the learning process but also constitutes academic dishonesty.

Using GenAI in your classes

- I will use AI-infused syllabus pilot for MAT 301-1800 Calculus I in-person meeting on Monday and Wednesday from 6:00pm-7:40pm at Fiterman 507.

- Schedule-planned date for lesson: Week 4 (Sept 16th)

Reflection

- How did this workshop change your perspective on the role of AI in education?

This workshop helped me discover how to integrate AI ethically and responsibly into my Calculus I class. In contemporary education, I believe the proper use of AI is essential to provide our students with a fundamental tool for their academic success.

- How do you envision integrating GenAI into your teaching?

First, I will explain to my students what AI is and how it can be used appropriately. Then, I will provide examples of how they can use generative AI as an assistant to review and enhance their Python lab assignments.

- What skills do you think educators need to develop to effectively leverage GenAI?

Educators need to understand what AI is, how it works, and how it can be used ethically and responsibly for the benefit of both students and instructors.

- How do you see GenAI shaping the future of higher education over the next 5-10 years?

I believe generative AI will become an essential assistant in both learning and teaching throughout higher education. Therefore, the sooner we understand and learn about it, the better prepared we will be for our academic journeys.