Core Course Summary

The six core courses listed below are designed to introduce students of business, social sciences and the humanities to key concepts and practices in the development of ethical data technologies. The courses will introduce students to the uses and implications of these technologies for economic, social and governmental contexts. While these courses will require no advanced technological knowledge or programming skills, students will develop a clear understanding of how these technologies work and are used in various contexts. Students will learn the pragmatic applications of these tools, but will also be taught to think through the high-level implications of these technologies with an eye to improving outcomes and mitigating negative impacts. These courses will set students up for success as they explore program themes of interdisciplinarity, employability and entrepreneurship.

- Intro to Data Technologies (PEQ Course) (3 Units)
    - Summary: In this course students will be introduced to the key themes in computational thinking and software programming. They will learn about the history and science of computation, understanding how computers came to emerge as perhaps the most useful tool in the past hundred years. Students will learn about the most up-to-date types of software and how these tools are being used in business, private and government contexts. In particular, students will learn about the function of data processing technologies including AI and machine learning algorithms.
    - Learning Objectives:
        - Students will be able to explain the relationship between hardware and software, and how these technological developments have supported and advanced one another to help spur rapid innovation in computational capabilities.
        - Students will be able to perform basic programming functions in order to understand how computers function and learn about the limits of their capabilities.
        - Students will be able to explain the importance of major developments in computational technologies since Turing.
        - Students will be able to describe the emergence of data technologies and their impact on the present and future of humans.

- Technology, AI and Society (TAS 201) (SOC/ANTH) (3 Units)
    - Summary: This course introduces the major emerging themes of AI and data ethics, for example: algorithmic discrimination in policing and finance, employment and safety consequences of automated vehicles, the consequences

of social media on democracy, and the politics of content moderation on news sites and social media platforms.

- o Learning Objectives:
  - Students will be able to define and identify the most serious kinds of risks and harms associated with data technology.
  - Students will be able to describe the most serious positive and negative impacts of machine learning through historical examples.
  - Students will be able to discuss the merits and potential drawbacks of data technologies as they increasingly affect human political, social and economic interactions.
  - Students will be able to describe the ways that AI and data technologies are now and will in the future shape the structure of human society.

- Introduction to AI and Machine Learning (TAS/CS) (3 Units)
  - o Summary: This course will introduce the core theory and tools of artificial intelligence and machine learning. Students will learn how to define and distinguish between different types of machine learning tools and the various problems they can help to solve. Students will also learn about the history and future of AI and machine learning technologies. The course will require little to no knowledge of software programming, but will help students to understand the technical development process and workflows.
  - o Learning Objectives
    - Students can define and identify various types of machine learning tools.
    - Students will be able to describe the relevant use cases for various types of AI and machine learning tools.
    - Students will be able to describe the importance of relevant breakthroughs in the history of machine learning.
    - Students will understand the projected timeline for the release of new forms of machine learning and AI technologies and how they are expected to evolve.

- Developing Ethical Data Technologies (TAS) (SOC/ANTH) (3 Units)
  - o Summary: This course will take students deeper into the practices required to create ethical AI and data technologies. Students will develop critical thinking and issue spotting skills that are key to ethical AI and data tool development. Students will understand the impacts of data technologies from a social impact perspective. This course will prepare students to help implement the critical business, policy and governance activities necessary to develop effective data and AI ethics processes within organization. Students will also explore various ethical and human rights-based frameworks for assessing the impacts of data technologies.
  - o Learning Objectives:

- Students will be able to spot and respond to potential ethical issues in the hypothetical and real scenarios in AI and data technologies.
- Students will understand the ethical implications for new and future AI and data technologies both at the individual and societal level.
- Students will be able to define and identify the difference between "AI for good" and "ethically built AI."
- Students will be able to describe the most current organizational practices for ensuring ethically built AI.

- AI Technologies Laboratory Course (TAS/CIS) (2 units)
  - Summary: In this course, students will get hands on experience with AI and machine learning technologies. Students will explore the development of AI and machine learning algorithms and models and their relationship to data sets. By exploring concrete examples of AI technologies and their implementations, students will be able to see specifically how these tools can be used in both business and public contexts. The course will not require any specific programming knowledge and can be completed with simple programming requirements.
  - Learning Objectives:
    - Students will work with and deepen their understanding of common AI/ML technologies including
      - Natural Language Processing and Computer vision tools.
      - Machine learning techniques including supervised, unsupervised, semi-supervised, reinforced and deep learning algorithms.
      - Classification algorithms including Nearest Neighbor, Naive Bayes, Decision Trees, Linear Regression, Support Vector Machines (SVM), Neural Networks, etc.
    - Students will learn to alter the outputs of AI/ML algorithms by altering datasets and data labels.
    - Students will complete the course by doing a deep dive into a chosen form AI technology and considering new and future applications of that technology.

- Technology, AI, Society Major Capstone Project (TAS) (4 units)
  - Summary: The TAS committee has tentatively described the capstone project for TAS majors as follows. "The TAS capstone project will bring together students from the School of Business and Leadership and the College of Arts and Sciences to work on a project in the area of Technology, AI and Society. Students will form groups to address a major social problem facing humans today or in the near future. Students will deliver a report and a recommendation on how this problem can be addressed using an Artificial Intelligence or Machine Learning technology. Key features of the report include identifying opportunities and

risks, leveraging those opportunities in business, non-profit, or governmental contexts and mitigating the risks using ethical thinking, issue spotting and design practices. The best projects will be those that have immediate real-world impact for the problem set that students are working on.

- o Learning Objectives:
    - Students will demonstrate the key capabilities of problem formulation and scoping, opportunity development and risk spotting and mitigations
    - Students will submit a professional-quality report (and presentation?) that will be ideal for the development of portfolios in their target career track.
    - Students will engage in deep collaboration activities, discovering their own strengths and weaknesses in teamwork, and learning more about their ability to contribute in a professional context.
    - Students will deliver a high quality product on a tight timeline, learning about their own needs around time-management, stress management and self-care.
    - Students will engage in detailed project scoping capabilities needed to develop a plan and determine the steps needed to achieve the goal
    - Students will gain the necessary research skills to determine how other attempts to solve a given problem have worked and what resources might be available to them in order to achieve success.