Georgia CTAE

Foundations of Artificial Intelligence (11.44300) (2021)

Adopted 2021

Demonstrate employability skills required by business and industry. IT-FAI-1

1. **Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.** IT-FAI-1.1
2. **Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.** IT-FAI-1.2
3. **Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations.** IT-FAI-1.3
4. **Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.** IT-FAI-1.4
5. **Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team-work skills.** IT-FAI-1.5
6. **Present a professional image through appearance, behavior, and language.** IT-FAI-1.6

Identify and describe the history and evolution of artificial intelligence. IT-FAI-2

1. **Define artificial intelligence and reflect on its current state.** IT-FAI-2.1
2. **Describe the history and evolution of artificial intelligence over time.** IT-FAI-2.2
3. **Identify important early examples of Artificial Intelligence and contributors to Artificial Intelligence development.** IT-FAI-2.3
4. **Describe how Artificial Intelligence could be used to solve problems, including historical, current, and future problems.** IT-FAI-2.4

Identify and describe the most current applications of artificial intelligence. IT-FAI-3

1. **Identify and describe current examples of Artificial Intelligence applications in everyday life (e.g., gaming, social media, virtual assistants, email, online shopping, travel, art, smartphones, etc.).** IT-FAI-3.1
2. **Identify and describe Artificial Intelligence technologies students interact with frequently and determine what problems and/or needs the Artificial Intelligence is intended to solve.** IT-FAI-3.2

	3. Discuss how Artificial Intelligence is and could be used to enhance areas of student interest, real-world problems, business needs, and the future of work. IT-FAI-3.3
	4. Identify and analyze how Artificial Intelligence is impacting art and other creative fields. IT-FAI-3.4
	5. Define critical and contemporary areas of Artificial Intelligence (e.g., machine learning, natural language processing, computer vision). IT-FAI-3.5
	6. Investigate how machines can be trained to recognize data and distinguish between two different classes by using a web tool that trains a machine learning model without coding (e.g., Google Teachable Machine, Weka). IT-FAI-3.6
Design, develop, test, and debug computer programs using elements of artificial intelligence. IT-FAI-4	1. Define, explain, and apply the building blocks of algorithms: sequencing, selection, iteration. IT-FAI-4.1
	2. Modify and create an algorithm to solve a problem. IT-FAI-4.2
	3. Evaluate algorithms analytically and empirically. IT-FAI-4.3
	4. Use an algorithm to create a program. IT-FAI-4.4
	5. Define, explain, and apply the ideas of decomposition, abstraction, data types (integer, string, Boolean, list/array), branches (if, then, else), iteration (for loop, while loop), event driven. IT-FAI-4.5
	6. Define different programming paradigms (e.g., functional, object-oriented, procedural, logic). IT-FAI-4.6
	7. Describe the principles of object-oriented programming. IT-FAI-4.7
	8. Create a program that implements loops and conditionals. IT-FAI-4.8
	9. Create a program that accepts user and sensor input to make a decision. IT-FAI-4.9
	10. Create a program that collects and organizes different data types. IT-FAI-4.10
	11. Define and implement comments in code to document the program. IT-FAI-4.11
	12. Trace code and debug problems in programs. IT-FAI-4.12
	13. Define UX (user experience) and explain why it must be considered when programming. IT-FAI-4.13
Describe different types of data and how they are used in artificial intelligence. IT-FAI-5	1. Identify the different kinds of data we collect and share as Internet users (e.g., images, videos, texts, purchasing information, site history, etc.). IT-FAI-5.1

	2. **Define the most basic types of data that computers use (e.g., numeric, text, dates, graphics, sound).** IT-FAI-5.2
	3. **Distinguish between data and information (e.g., data requires context to be information).** IT-FAI-5.3
	4. **Describe and construct a simple model of the data processing cycle (input-processing-output).** IT-FAI-5.4
	5. **Summarize how computers store data using bits (binary digits).** IT-FAI-5.5
	6. **Define Big Data and describe how it is used in Artificial Intelligence.** IT-FAI-5.6
	7. **Describe how Artificial Intelligence uses data to make predictions or decisions.** IT-FAI-5.7
	8. **Define logic and summarize its use in programming, including Artificial Intelligence.** IT-FAI-5.8
Collect, organize, and analyze data using spreadsheet tools. IT-FAI-6	1. **Select and organize different types of data using spreadsheet tools.** IT-FAI-6.1
	2. **Define and implement basic preset spreadsheet function to organize and manipulate data.** IT-FAI-6.2
	3. **Create tables and graphs to represent data visually using spreadsheets.** IT-FAI-6.3
	4. **Analyze data to construct informed summaries, decisions, or predictions related to the data.** IT-FAI-6.4
Describe and research the social and ethical impacts of artificial intelligence. IT-FAI-7	1. **Define bias, perception, privacy, and accuracy in the context of Artificial Intelligence.** IT-FAI-7.1
	2. **Explore potential examples of bias using a web tool that trains a machine learning model without coding (e.g., Google Teachable Machine, Weka).** IT-FAI-7.2
	3. **Describe and critique how ethics and philosophy explicitly and implicitly play a role in Artificial Intelligence applications.** IT-FAI-7.3
	4. **Define and compare ethical and legal implications of Artificial Intelligence.** IT-FAI-7.4
	5. **Identify and describe ethical and societal Artificial Intelligence issues in a variety of settings (e.g., public safety, financial implications, social media marketing, government uses, different cultures and countries).** IT-FAI-7.5

	6. **Research the purpose of Artificial Intelligence for Good Foundation and other similar organizations (e.g., The Center for Human Compatible Artificial Intelligence, The Future of Life Institute) and describe their role in Artificial Intelligence development.** IT-FAI-7.6
Use a creative problem-solving process to collaboratively solve problems relevant to artificial intelligence. IT-FAI-8	1. **Define, describe, and demonstrate productive collaboration, problem-solving, and leadership skills.** IT-FAI-8.1 2. **Analyze the value of diversity in backgrounds and perspectives in collaboration and problem- solving.** IT-FAI-8.2 3. **Apply computational thinking skills to find alternative or creative solutions to problems.** IT-FAI-8.3 4. **Define the purpose of the Design Thinking Process and describe its steps (e.g., empathize, define, ideate, prototype, test).** IT-FAI-8.4 5. **Apply the Design Thinking Process to collaboratively solve real-world problems.** IT-FAI-8.5
Examine how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects and competitive events. IT-FAI-9	1. **Explain the goals, mission, and objectives of the career-technical student organization (CTSO).** IT-FAI-9.1 2. **Explore the impact and opportunities a student organization can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.** IT-FAI-9.2 3. **Explore the local, state, and national opportunities available to students through participation in related student organization including but not limited to conferences, competitions, community service, philanthropy, and other CTSO activities.** IT-FAI-9.3 4. **Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.** IT-FAI-9.4 5. **Explore the competitive events related to the content of this course and the required competencies, skills, and knowledge for each related event for individual, team, and chapter competitions.** IT-FAI-9.5