Information Technology Career Cluster
Foundations of Artificial Intelligence
Course Number (Given by GaDOE-CTAE)

Course Description:
Artificial Intelligence is an area of study that deals with the simulation of intelligent behavior in computers. Artificial Intelligence sits at the intersection and synergy of critical components from a variety of fields including programming, data science, mathematical reasoning, creative problem solving, ethics, and applied experiences. Careers that require Artificial Intelligence skills (machine learning, data science, programming, etc.) are on the rise and many careers that have existed for years, like Data Analyst or Software Developer, are shifting and growing in industries designing Artificial Intelligence solutions. Foundations of Artificial Intelligence is the introductory course to the Artificial Intelligence pathway, which prepares students to better understand common Artificial Intelligence applications and to apply their knowledge to solve real-world problems using advanced technologies. This introductory course explores the foundations of Artificial Intelligence in society and the workplace, including programming, data science, mathematical reasoning, creative problem solving, ethical reasoning, and real-world applications of Artificial Intelligence. Students will learn the foundational skills to understand how to both interact and develop Artificial Intelligence solutions in a variety of settings.

Course Standard 1

IT-FAI-1
The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.
The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application

Reading Body Language and mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé
Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

1.3 Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers

Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply teamwork skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior, and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

Course Standard 2

IT-FAI-2

Identify and describe the history and evolution of artificial intelligence.

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

Course Standard 3

IT-FAI-3

Identify and describe the most current applications of artificial intelligence.

- 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.).
- 3.2 Identify and describe Artificial Intelligence technologies students interact with frequently and determine what problems and/or needs the Artificial Intelligence is intended to solve.
- 3.3 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.
- 3.4 Identify and analyze how Artificial Intelligence is impacting art and other creative fields.
- 3.5 Define critical and contemporary areas of Artificial Intelligence (e.g., machine learning, natural language processing, computer vision).
- 3.6 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).

Course Standard 4

IT-FAI-4

Design, develop, test, and debug computer programs using elements of artificial intelligence.

- 4.1 Define, explain, and apply the building blocks of algorithms: sequencing, selection, iteration.
- 4.2 Modify and create an algorithm to solve a problem.
- 4.3 Evaluate algorithms analytically and empirically.
- 4.4 Use an algorithm to create a program.
- 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.
- 4.6 Define different programming paradigms (e.g., functional, object-oriented, procedural, logic).
- 4.7 Describe the principles of object-oriented programming.
- 4.8 Create a program that implements loops and conditionals.
- 4.9 Create a program that accepts user and sensor input to make a decision.
- 4.10 Create a program that collects and organizes different data types.
- 4.11 Define and implement comments in code to document the program.
- 4.12 Trace code and debug problems in programs.
- 4.13 Define UX (user experience) and explain why it must be considered when programming.

Course Standard 5

IT-FAI-5: Describe different types of data and how they are used in artificial intelligence.

- 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.).
- 5.2 Define the most basic types of data that computers use (e.g., numeric, text, dates, graphics, sound).
- 5.3 Distinguish between data and information (e.g., data requires context to be information).
- 5.4 Describe and construct a simple model of the data processing cycle (input-processing-output).
- 5.5 Summarize how computers store data using bits (binary digits).

5.6 Define Big Data and describe how it is used in Artificial Intelligence.
5.7 Describe how Artificial Intelligence uses data to make predictions or decisions.
5.8 Define logic and summarize its use in programming, including Artificial Intelligence.

Course Standard 6

IT-FAI-6
Collect, organize, and analyze data using spreadsheet tools.

6.1 Select and organize different types of data using spreadsheet tools.
6.2 Define and implement basic preset spreadsheet function to organize and manipulate data.
6.3 Create tables and graphs to represent data visually using spreadsheets.
6.4 Analyze data to construct informed summaries, decisions, or predictions related to the data.

Course Standard 7

IT-FAI-7
Describe and research the social and ethical impacts of artificial intelligence.

7.1 Define bias, perception, privacy, and accuracy in the context of Artificial Intelligence.
7.2 Explore potential examples of bias using a web tool that trains a machine learning model without coding (e.g., Google Teachable Machine, Weka).
7.3 Describe and critique how ethics and philosophy explicitly and implicitly play a role in Artificial Intelligence applications.
7.4 Define and compare ethical and legal implications of Artificial Intelligence.
7.5 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).
7.6 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.

Course Standard 8

IT-FAI-8
Use a creative problem-solving process to collaboratively solve problems relevant to artificial intelligence.

8.1 Define, describe, and demonstrate productive collaboration, problem-solving, and leadership skills.
8.2 Analyze the value of diversity in backgrounds and perspectives in collaboration and problem-solving.
8.3 Apply computational thinking skills to find alternative or creative solutions to problems.
8.4 Define the purpose of the Design Thinking Process and describe its steps (e.g., empathize, define, ideate, prototype, test).
8.5 Apply the Design Thinking Process to collaboratively solve real-world problems.

Course Standard 9

IT-FAI-9
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.

9.1 Explain the goals, mission, and objectives of the career-technical student organization (CTSO).
9.2 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.
9.3 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.

9.4 Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.
9.5 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.