

**Information Technology Career Cluster  
Programming, Games, Apps, and Society  
Course Number: 11.47200**

**Course Description:**

Are you ready to design and develop? The course is designed for high school students to strategize, design, and develop games and mobile and desktop applications that can be produced in the real world. Students will learn about life cycles of project development and use models to develop applications. Attention will be placed on how user interfaces affect the usability and effectiveness of a game or an application. Programming constructs will be employed which will allow students' applications to interact with "real world," stimuli. The course exposes students to privacy, legality, and security considerations with regards to the software industry.

Various forms of technologies will be used to expose students to resources, software, and applications of programming. Professional communication skills and practices, problem-solving, ethical and legal issues, and the impact of effective presentation skills are enhanced in this course to prepare students to be college and career ready. Employability skills are integrated into activities, tasks, and projects throughout the course standards to demonstrate the skills required by business and industry. Competencies in the co-curricular student organizations are integral components of both the employability skills standards and content standards for this course.

Programming, Games, Apps and Society is the third course in the Programming pathway in the Information Technology cluster. Students enrolled in this course should have successfully completed Introduction to Software Technology and Computer Science Principles. After mastery of the standards in this course, students should be prepared to take the end of pathway assessment in this career area.

**Course Standard 1**

**IT-PGAS-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

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	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

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				Staying Motivated to Search
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### 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

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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			

### Course Standard 2

#### IT-PGAS-2

**Describe various software application life cycle models and select a model to develop applications.**

- 2.1 Demonstrate understanding of various software development cycle models (Waterfall, Agile, etc.) and the advantages or disadvantages of each.
- 2.2 Select a design model and use it to design an application.
- 2.3 Use selected development model to implement a cell phone or video game application.
- 2.4 Write properly structured programs using proper commenting and naming conventions. Upload to online career portfolio.
- 2.5 Test program for completeness and accuracy.

### Course Standard 3

#### IT-PGAS-3

**Design and develop applications using Object-Oriented Programming.**

- 3.1 Demonstrate knowledge of primitive (built-in) data types.
- 3.2 Demonstrate knowledge of custom data types (objects) and how they are structured and instantiated.
- 3.3 Design applications with multiple objects interacting with one another or containing other objects.
- 3.4 Develop event-driven programs using objects to solve problems.

### Course Standard 4

#### IT-PGA-4

**Design, develop, and implement accessible and usable interfaces, and analyze applications for engaging the user.**

- 4.1 Identify the components of a user interface.
- 4.2 List the criteria used to determine the effectiveness of an interface.
- 4.3 Design and produce a user interface.
- 4.4 Apply user interface design criteria to critique common user interfaces (mobile phones, tablets, remote controls, and microwave ovens).
- 4.5 Discuss how the design of applications can influence and motivate or demotivate the user.
- 4.6 Apply software development practices to a programming project.
- 4.7 Test the program for usability.

## Course Standard 5

### IT-PGA-5

#### Use and implement different digital representations of media.

- 5.1 Explain the relative strengths and weaknesses of different images file formats.
- 5.2 Explain the relative strengths and weaknesses of different representations of music and sound.
- 5.3 Write a program that implements multiple images with sound.
- 5.4 Develop a program that incorporates both audio and image files. Upload to online career portfolio.
- 5.5 Research tools and techniques to create triggers and events that serve to modify the attributes of audio and image files.

## Course Standard 6

### IT-PGA-6

#### Evaluate an application design in terms of meeting privacy needs, legal and intellectual property requirements, and security considerations.

- 6.1 Understand privacy needs in the development of application software.
- 6.2 Explain how security considerations play a part in software development.
- 6.3 Evaluate how intellectual property plays into to the development of applications.
- 6.4 Research examples of how security and privacy leaks in applications have affected users and society.

## Course Standard 7

### IT-PGA-7

#### Develop applications that read real-world data from sensors, interpret the data, and respond to the real-world stimuli.

- 7.1 Plan how real-world data collection can influence design decisions.
- 7.2 Develop a program that interprets and reacts to sensor or human input.
- 7.3 Write a program that reads external data and manipulates it to solve a problem. Upload to online career portfolio.

## Course Standard 8

### IT-PGA-8

#### Describe the unique needs for information and communication technologies for diverse audiences.

- 8.1 Understand the need for designing software that is intuitive and user-friendly.
- 8.2 Conduct research and apply modifications to make programs inclusive and enhance the user experience.
- 8.3 Research the W3C Accessibility standards.
- 8.4 Demonstrate use of W3C Accessibility standards in a program for those with special needs.
- 8.5 Develop an example set of criteria or requirements for application development for a specific special need.
- 8.6 Explain and demonstrate how software developers remove all text literals from programs and store them in resource files so that international translations for software can be easily incorporated into programs (resource file use for translations).

## Course Standard 9

### IT-PGA-9

#### **Organize personal online career portfolio for specific career interests.**

- 9.1 Review and update résumé to reflect new knowledge and skills master and additional work experience.
- 9.2 Organize folders within the portfolio to reflect specific careers of interest, including résumé, targeted cover letter, and artifacts relevant to the specific career.
- 9.3 Update all current items in the portfolio.
- 9.4 Identify and upload additional industry-appropriate artifacts reflective of mastered skills throughout this course. Write and include a reflective entry for each artifact discussing steps taken, problems encountered and how they were overcome, and other pertinent information about the learning.
- 9.5 Edit all entries in the online career portfolio to ensure accuracy and professionalism as expected from employers.
- 9.6 Conduct a job search and share the appropriate folder with the potential employer.

## Course Standard 10

### IT-PGA-10

#### **Explore how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, entrepreneurship development, and competitive events.**

- 10.1 Explain the goals, mission, and objectives of Future Business Leaders of America (FBLA) and/or Technology Student Association (TSA) and/or SkillsUSA.
- 10.2 Explore the impact and opportunities a student organization (FBLA, TSA, SkillsUSA) can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.
- 10.3 Explore the local, state, and national opportunities available to students through participation in related student organizations (FBLA, TSA, SkillsUSA) including but not limited to conferences, competitions, community service, philanthropy, and other student organization activities.
- 10.4 Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.
- 10.5 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.