

MISSION TRAILS REGIONAL OCCUPATIONAL PROGRAM

1. COURSE TITLE: Computer Gaming, Design and Animation

2. CBEDS TITLE: Computer Gaming, Design and Animation

3. CBEDS NUMBER: 5792

4. JOB TITLES: Programmer Television Graphic Designer
Software Engineer Storyboard Designer
3D Modeling Concept Illustrator
Interactive Educational Designer
Freelance Designer Game Designer

5. COURSE DESCRIPTION:

This course designed to introduce the student to the Video Game Design Industry and the basic process necessary to complete the design of a video game. The student will develop an understanding of the current industry situation, the history of video games, the design process, visual communication, graphic design, animation, 3D Modeling using 3D Studio Max, storyboarding, games genres, the creation of design documents, character design, game engine integration issues, basic concepts of Gameplay, dimensional form analysis, sound authoring and more.

6. HOURS:	Classroom Theory/Applied	210
	Community classroom/Coop Voc Ed	150
	Total Hours	360

7. PREREQUISITES: Must be 15 years of age or older. Must have basic computer skills, basic Math, Algebra, and Geometry skills.

8. REVISION DATE: 2/28/09

9 COURSE OUTLINE:

a) CONTENT AREA SKILLS

i) EXPECTED STUDENT OUTCOMES

ii) HOURS OF INSTRUCTION

COURSE OUTLINE

CONTENT AREA SKILLS	EXPECTED STUDENT OUTCOMES	HOURS		
		CL	CC	C P
Instruction will include:	Student will be able to:			
A. Career Preparation Skills & General Workplace Skills	<ol style="list-style-type: none"> 1. Work both independently and collaboratively. 2. Attends regularly and on time 3. Practices good safety procedures. 4. Solves problems thinks critically and makes good decisions. 5. Plans work and takes initiative. 6. Demonstrates leadership and the willingness to help train others. 7. Develop a plan to achieve career goals. 8. Use effective job search strategies. 9. Perform employment research and interview. 10. Complete job application and resume. 11. Develop effective interviewing and follow-up Skills. 12. Demonstrate an awareness of importance of Lifelong learning. 13. Visit various sites to see programmers in action. 	30		

<p>B. An introduction to video game programming</p>	<p>A. Identify the components of the video game Programming process.</p> <ol style="list-style-type: none"> 1. The programming code (C/C++) 2. Game loop concepts 3. Input concepts (mouse, keyboard) 4. Sound, visual, and special effects 5. Event listeners <p>B. Know the theoretical basis for video game design</p> <ol style="list-style-type: none"> 1. Discuss and evaluate Gameplay and game genres. 2. Explain elements included in pre-production, Production, and post-production areas. 3. Describe the requirements needed to create engaging Gameplay. <ul style="list-style-type: none"> • Establish of story requirements • Create storyboard and characters • Deduce the types of technology needed • Formulate game environment rules 4. Understand the importance of back-story to character design and its relation to the overall organization of the video game. <p>C. Apply math concepts to video game design and development</p> <p>D. Examine the ethical, psychological and physiological issues surrounding the design and use of video games.</p>	<p>15</p>	<p>10</p>	
<p>C. C/C++ Programming</p>	<p>A. Overview of the programming language</p> <p>B. Create expressions, statements, functions, Pointers, and structures</p> <p>C. Compile and handle game events.</p> <p>D. Establish linking the components</p> <p>E. Develop flowcharts and top view diagrams to document and communicate game elements and flow.</p> <p>F. Explain programming issues using C script and ActionScript</p> <p>G. Object oriented programming.</p> <p>H. Polymorphism</p>	<p>25</p>	<p>30</p>	

D. Artistic and Digital Graphic components	<p>A. Design characters and backgrounds with 2D/3D Computer animation</p> <ol style="list-style-type: none"> 1. Use modeling, animation and rendering techniques 2. Apply color theory, form analysis, character design <p>B. Create materials and texture maps</p> <p>C. Apply basic lighting and key framing techniques</p> <p>D. Select basic camera manipulations</p> <p>E. Order and establish hierarchy linking</p> <p>F. Applying these creative concepts to real-life experience in animation production (use strong traditional art skills)</p>	20	30	
E. Traditional 2D and 3D Animation Principals	<p>A. Demonstrate an understanding of the physiology of seeing</p> <ol style="list-style-type: none"> 1. Describe and apply a clear understanding of the relationship between kinematics, physics and game design 2. Develop using traditional animation concepts <ul style="list-style-type: none"> * compression and elongation, exaggeration * anticipation and staging * straight ahead action and pose to pose * follow through and overlapping action * slow in and slow out, secondary action, timing 	60	40	
F. Advanced 3D Animation	<p>A. Use production techniques involved with animating characters to be more life-like.</p> <ol style="list-style-type: none"> 1. Advanced character design 2. Advanced modeling for creating characters 3. Use of bones systems and basic anatomy 4. Facial animation 5. Inverse kinematics <p>B. Apply basic scene navigation</p> <ol style="list-style-type: none"> 1. Create a scene using primitive shapes 2. Use modifiers to alter objects 3. Use face extrusion and Boolean operations to change geometry and give depth to objects 4. Model low polygon characters and vehicles 5. Determine the best type of lighting for a given Gameplay situation 	60	40	
Total Hours		210	150	

10 COURSE OUTLINE:

b) CAREER PERFORMANCE STANDARDS

- i) EXPECTED STUDENT OUTCOMES
- ii) HOURS OF INSTRUCTION

COURSE OUTLINE

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	Student will be able to:	
<p>1. Personal Skills</p> <ul style="list-style-type: none"> ▪ Classroom policies & procedures ▪ Ethics <ul style="list-style-type: none"> → Work → Business ▪ Sexual harassment laws ▪ Personal skills, including positive attitude, self-confident, honesty, perseverance & self-discipline ▪ Professional appearance ▪ Time management ▪ Lifelong learning 	<p>1. Understand how personal skill development, including positive attitude, honesty, self-confidence, time management, & other positive traits affect employability.</p> <ul style="list-style-type: none"> ▪ Demonstrate and understand classroom policies & procedures ▪ Define work and business ethics & demonstrate the importance of ethical standards & social responsibilities in the business environment. ▪ Discuss the laws applicable to sexual harassment & discuss tactics for handling harassment situations. ▪ Demonstrate personal skills in class and/or business environment: <ul style="list-style-type: none"> → Positive attitude → Self-confidence → Honesty → Perseverance → Self-discipline ▪ Demonstrate and model personal hygiene and acceptable professional attire ▪ Prioritize tasks and meet deadlines ▪ Explain the importance of lifelong learning 	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	Student will be able to:	
<p>2. Interpersonal Skills</p> <ul style="list-style-type: none"> ▪ Group dynamics ▪ Conflict resolution and negotiation ▪ Team work ▪ Etiquette across gender and cultural groups 	<p>2. Understand principles of effective interpersonal skills, including group dynamics, conflict resolution, and negotiation.</p> <ul style="list-style-type: none"> ▪ Identify and explain the key concepts of group dynamics ▪ Discuss and demonstrate the dynamics of conflict resolution and negotiation, and their importance within the business environment ▪ Demonstrate effective teamwork, share responsibilities, accept supervision and assume leadership roles ▪ Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups 	<p>Integrated in content area skills</p>
<p>3. Thinking and Problem-Solving Skills</p> <ul style="list-style-type: none"> ▪ Critical and creative thinking skills ▪ Logical reasoning and problem-solving skills ▪ Numerical estimation, measurement, and calculation ▪ Identify, locate, and organize needed information and propose, evaluate, and select alternative solutions 	<p>3. Understand the importance of critical thinking and problem-solving skills in the workplace.</p> <ul style="list-style-type: none"> ▪ Apply critical and creative thinking skills in a work environment and implement a plan of improvement as needed ▪ Demonstrate logical reasoning and problem solving skills in a work environment ▪ Apply numerical estimation, measurement and calculation skills to business applications including the following: <ul style="list-style-type: none"> → Whole number math → Decimals & fractions → Counting & monetary functions → Use of tables & graphs ▪ Recognize problem situations; identify, locate and organize needed information, and propose, evaluate and select from alternate solutions 	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	Student will be able to:	
<p>4. Communication Skills</p> <ul style="list-style-type: none"> ▪ Written communications ▪ Verbal and Nonverbal communications ▪ Active and effective listening ▪ Proper etiquette in business communications ▪ Writing and editing skills ▪ Use of reference material and handbooks ▪ Oral presentations 	<p>4. Understand principles of effective communication.</p> <ul style="list-style-type: none"> ▪ Read and implement written instructions, technical manuals, written communication, and reference books ▪ Present a positive image of verbal and nonverbal communication through use of appropriate methods ▪ Demonstrate active and effective listening skills through verbal, nonverbal and written feedback ▪ Demonstrate proper etiquette in business communications, including an awareness of requisite for international communications (languages, customs, and time zones) ▪ Demonstrate the following writing and editing skills: <ul style="list-style-type: none"> → Use correct grammar, punctuation, capitalization, vocabulary and spelling → Write, proofread and edit → Select and use appropriate forms of communication ▪ Exhibit a proficiency in the use of reference materials such as dictionary, thesaurus, telephone directory, almanac, zip code directory, and office handbooks 	<p>Integrated in content area skills</p>
<p>5. Occupational Safety</p> <ul style="list-style-type: none"> ▪ Good safety practices 	<p>5. Understand occupational safety issues, including avoidance of physical hazards</p> <ul style="list-style-type: none"> ▪ Model and implement good safety practices including: <ul style="list-style-type: none"> → Avoidance and reporting of physical hazards in the work environment → Safe operation of equipment → Proper handling of hazardous materials 	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	Student will be able to:	
<p>6. Employment Literacy</p> <ul style="list-style-type: none"> ▪ Expand awareness of career opportunities ▪ Set employment goals and objectives ▪ Aptitudes, personal characteristics and interests ▪ Develop portfolio to C-TAP standards ▪ Develop interviewing techniques 	<p>6. Understand career paths and strategies for obtaining employment.</p> <ul style="list-style-type: none"> ▪ Explore career opportunities and develop a career plan ▪ Identify steps for setting goals and writing personal goals and objectives ▪ Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities ▪ Develop a portfolio to include the following: <ul style="list-style-type: none"> → Letter of Introduction → Cover letter → Resume → Thank you letter → Job application → Licenses, Certificates and Awards → Transcripts → Letters of Recommendation → Work Samples 	<p>Integrated in content area skills</p>
<p>7. Technology Literacy</p> <ul style="list-style-type: none"> ▪ Apply Industry specific technology ▪ Use Industry specific software ▪ Demonstrate Keyboarding ▪ Accessing information ▪ Lifelong enhancement of technology skills 	<p>7. Understand and adapt to changing technology.</p> <ul style="list-style-type: none"> ▪ Identify and demonstrate use of appropriate technology ▪ Identify and use industry specific software ▪ Demonstrate proficiency in alphanumeric keyboarding ▪ Input and retrieve information ▪ Understand the importance of lifelong learning in adapting to changing technology 	<p>Integrated in content area skills</p>

11. ADDITIONAL RECOMMENDED /OPTIONAL ITEMS

- a. ARTICULATION:**

- b. VOCATIONAL CREDIT:**

- c. ACADEMIC CREDIT: 10 high school credits per year.**

- d. INSTRUCTIONAL STRATEGIES: Demonstrations, Lab, Lecture, Projects, Reading assignments, Oral questioning, Multimedia, Hands-on practice, Role playing, Simulations, Written assignments, Written tests and quizzes.**

- e. INSTRUCTIONAL MATERIALS:**

- f. CERTIFICATES: Students will receive a Mission Trails ROP course certificate listing their job skill proficiencies.**