

DESE Model Curriculum: Computer Programming (CIP Code: 11.0103)

GRADE LEVEL/UNIT TITLE: 11-12/Apply Logical Problem-Solving Skills

COURSE INTRODUCTION						
Computer technology skills are vital to business; they permeate the entire workplace. Familiarity with computer programming is required in a growing number of firms and occupations primarily because of the increasingly widespread use of computerized management information systems.						
This course focuses on converting problems into detailed plans, writing code into computer language, testing, monitoring, debugging, documenting and maintaining computer programs. Students will also design programs for specific uses.						
UNIT DESCRIPTION				SUGGESTED UNIT TIMELINE		
Students will learn programming principles to solve problems.				2 weeks		
				CLASS PERIOD (min.)		
				50 min.		
ESSENTIAL QUESTIONS						
1. What is the relationship of problem solving to computer programming?						
2. What is outcome of problem solving?						
3. What is the benefit of reusable components?						
ESSENTIAL MEASURABLE LEARNING OBJECTIVES		NBEA STANDARD			DOK	
1. Analyze a problem		IT-X.3	COMM-I.C.2	COMP-V.2	MGMT-I.D.3	4
		IT-X.4	COMM-I.C.3	COMP-V.3	ENT-II.B.1	
		COMM-I.A.1	COMM-I.C.4	COMP-V.4	ENT-II.B.2	
		COMM-I.A.2	COMP-I.1	MGMT-I.A.1	ENT-II.C.1	
		COMM-I.A.3	COMP-II.1	MGMT-I.A.2	ENT-II.C.2	
		COMM-I.A.4	COMP-II.2	MGMT-I.A.3	ENT-VI.D.1	
		COMM-I.B.1	COMP-III.1	MGMT-I.B.1	ENT-VI.D.2	
		COMM-I.B.2	COMP-III.2	MGMT-I.B.2	ENT-VI.D.3	
		COMM-I.B.3	COMP-IV.1	MGMT-I.B.3	ENT-IX.1	
		COMM-I.B.4	COMP-IV.2	MGMT-I.D.1	ENT-IX.2	
COMM-I.C.1	COMP-IV.3	MGMT-I.D.2				
2. Determine the steps needed to solve a problem		IT-X.3	COMP-III.2	COMP-V.4	MGMT-I.B.2	3
		IT-X.4	COMP-IV.1	MGMT-I.A.1	MGMT-I.B.3	
		COMP-I.1	COMP-IV.2	MGMT-I.A.2	MGMT-I.D.1	
		COMP-II.1	COMP-IV.3	MGMT-I.A.3	MGMT-I.D.2	
		COMP-II.2	COMP-V.2	MGMT-I.B.1	MGMT-I.D.3	
		COMP-III.1	COMP-V.3			

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<p>3. Create an algorithm to solve a problem</p>	<p>IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XIII.2 IT-XIII.3 IT-XIII.4 COMP-I.1 COMP-II.1 COMP-II.2 COMP-III.1 COMP-III.2</p>	<p>COMP-IV.1 COMP-IV.2 COMP-IV.3 COMP-V.2 COMP-V.3 COMP-V.4 COMP-VI.A.3 COMP-VI.A.4 COMP-VI.B.1 COMP-VI.B.2 COMP-VI.B.3 COMP-VI.B.4 COMP-VI.C.1</p>	<p>COMP-VI.C.2 COMP-VI.C.3 COMP-VI.D.1 COMP-VI.D.2 COMP-VI.D.3 COMP-VI.E.3 COMP-VI.E.4 COMP-VI.F.2 COMP-VI.F.3 COMP-VI.F.4 COMP-VI.G.1 COMP-VI.G.2</p>	<p>COMP-VI.G.3 COMP-VI.H.1 COMP-VI.H.2 COMP-VI.H.3 COMP-VI.I.3 COMP-VI.I.4 COMP-VI.J.3 COMP-VI.J.4 COMP-VI.K.2 COMP-VI.K.3 COMP-VI.L.3 COMP-VI.M.3</p>	<p align="center">4</p>
<p>4. Illustrate the problem solution using a storyboard, flowchart or pseudocode</p>	<p>IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-IV.1 IT-IV.2 IT-IV.3 IT-IV.4 IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XIII.2 IT-XIII.3 IT-XIII.4</p>	<p>IT-XVIII.1 IT-XVIII.2 IT-XVIII.3 IT-XVIII.4 COMP-I.1 COMP-II.1 COMP-II.2 COMP-III.1 COMP-III.2 COMP-IV.1 COMP-IV.2 COMP-IV.3 COMP-V.2 COMP-V.3 COMP-V.4 COMP-VI.A.3</p>	<p>COMP-VI.A.4 COMP-VI.B.1 COMP-VI.B.2 COMP-VI.B.3 COMP-VI.B.4 COMP-VI.C.1 COMP-VI.C.2 COMP-VI.C.3 COMP-VI.D.1 COMP-VI.D.2 COMP-VI.D.3 COMP-VI.E.3 COMP-VI.E.4 COMP-VI.F.2 COMP-VI.F.3</p>	<p>COMP-VI.F.4 COMP-VI.G.1 COMP-VI.G.2 COMP-VI.G.3 COMP-VI.H.1 COMP-VI.H.2 COMP-VI.H.3 COMP-VI.I.3 COMP-VI.I.4 COMP-VI.J.3 COMP-VI.J.4 COMP-VI.K.2 COMP-VI.K.3 COMP-VI.L.3 COMP-VI.M.3</p>	<p align="center">3</p>

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5. Build a program from a storyboard, flowchart, or pseudocode	IT-IV.1 IT-IV.2 IT-IV.3 IT-IV.4 IT-X.3 IT-X.4 IT-XI.2 IT-XI.3	IT-XI.4 IT-XIII.2 IT-XIII.3 IT-XIII.4 IT-XVIII.1 IT-XVIII.2 IT-XVIII.3	IT-XVIII.4 MGMT-IV.A.1 MGMT-IV.A.2 MGMT-IV.A.3 MGMT-IV.A.4 MGMT-IV.B.1 MGMT-IV.B.2	MGMT-IV.B.3 MGMT-VIII.A.1 MGMT-VIII.A.2 MGMT-VIII.A.3 MGMT.VIII.A.4 MGMT-XI.A.3 MGMT-XI.A.4	4
6. Explain how to create and integrate reusable component into a program	IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XIII.2 IT-XIII.3 IT-XIII.4 IT-XVIII.1 IT-XVIII.2 IT-XVIII.3 IT-XVIII.4 COMM-I.A.1 COMM-I.A.2	COMM-I.A.3 COMM-I.A.4 COMM-I.B.1 COMM-I.B.2 COMM-I.B.3 COMM-I.B.4 COMM-I.C.1 COMM-I.C.2 COMM-I.C.3 COMM-I.C.4 COMP-I.1 COMP-II.1 COMP-II.2 COMP-III.1 COMP-III.2 COMP-IV.1 COMP-IV.2 COMP-IV.3	COMP-V.2 COMP-V.3 COMP-V.4 COMP-VI.A.3 COMP-VI.A.4 COMP-VI.B.1 COMP-VI.B.2 COMP-VI.B.3 COMP-VI.B.4 COMP-VI.C.1 COMP-VI.C.2 COMP-VI.C.3 COMP-VI.D.1 COMP-VI.D.2 COMP-VI.D.3 COMP-VI.E.3 COMP-VI.E.4	COMP-VI.F.2 COMP-VI.F.3 COMP-VI.F.4 COMP-VI.G.1 COMP-VI.G.2 COMP-VI.G.3 COMP-VI.H.1 COMP-VI.H.2 COMP-VI.H.3 COMP-VI.I.3 COMP-VI.I.4 COMP-VI.J.3 COMP-VI.J.4 COMP-VI.K.2 COMP-VI.K.3 COMP-VI.L.3 COMP-VI.M.3	3
7. Explain how a program is tested and accepted for release	IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-X.3 IT-X.4 IT-XI.2	IT-XI.3 IT-XI.4 IT-XVIII.1 IT-XVIII.2 IT-XVIII.3 IT-XVIII.4	COMM-I.A.1 COMM-I.A.2 COMM-I.A.3 COMM-I.A.4 COMM-I.B.1 COMM-I.B.2	COMM-I.B.3 COMM-I.B.4 COMM-I.C.1 COMM-I.C.2 COMM-I.C.3 COMM-I.C.4	3

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8. Document code	IT-XI.2 IT-XI.3 IT-XI.4	2
ASSESSMENT DESCRIPTIONS		
<ol style="list-style-type: none"> 1. Two Class Video PSAs-one serious and one funny (summative) 2. Flowcharting and pseudo design projects (formative and summative) 3. Students create flowcharts/pseudo components (formative and summative) 4. UserReqLab.doc – students actually interview “customers” and develop the user requirements for the project (summative) 		
OBJ. #	INSTRUCTIONAL STRATEGIES	
3-6	1. Lecture/demonstration; Independent Learning	
1, 2	2. Lecture	
7	3. Cooperative Learning	
8	4. Independent Learning	
OBJ. #	INSTRUCTIONAL ACTIVITIES	
3-6	1. Lecture/demonstration on flow charting, pseudo-code, storyboards and other design techniques	
1, 2	2. Lecture on problem solving and user requirements gathering	
8	3. Students use different techniques to design simple systems (i.e. wake up and get to school and attached mazes)	
7	4. Documentation of code will be dependent upon the programming language	
7	5. GamesFromWithin.com/writing-reusable-code - lecture/discussion starting point	
UNIT RESOURCES		
n/a		