

DESE Model Curriculum

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

Course Code: 034355

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.

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UNIT DESCRIPTION: Students will learn programming principles to solve problems.		SUGGESTED UNIT TIMELINE: 2 WEEKS				
		CLASS PERIOD (min.): 50 MINUTES				
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 re-usable components?						
ESSENTIAL MEASURABLE LEARNING OBJECTIVES		CCSS LEARNING GOALS (Anchor Standards/Clusters)	CROSSWALK TO STANDARDS			
		GLEs/CLEs	PS	CCSS	NBEA	DOK
1. Analyze a problem				S-ID.8 S-MD.5 S-MD.6 S-MD.7 S-MD.8 G-GMD.3 F-BF.1 F-BF.2 A-APR.1 A-CED.1 A-CED.4 A-REI.1 A-REI.2 A-REI.3 A-REI.4 N-Q.1 N-Q.2 N-Q.3	IT-X.3 IT-X.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	4

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				N-VM.6 N-VM.12 RI.11-12.1 RI.11-12.2 RI.11-12.3 RI.11-12.4 RI.11-12.5 RI.11-12.6 RI.11-12.7 RI.11-12.10 L.11-12.1 L.11-12.2 L.11-12.3 L.11-12.4 L.11-12.5 L.11-12.6 RST.11-12.1 RST.11-12.2 RST.11-12.3 RST.11-12.4 RST.11-12.5 RST.11-12.6 RST.11-12.7 RST.11-12.8 RST.11-12.9 RST.11-12.10	COMP-III.2 COMP-IV.1 COMP-IV.2 COMP-IV.3 COMP-V.2 COMP-V.3 COMP-V.4 MGMT-I.A.1 MGMT-I.A.2 MGMT-I.A.3 MGMT-I.B.1 MGMT-I.B.2 MGMT-I.B.3 MGMT-I.D.1 MGMT-I.D.2 MGMT-I.D.3 ENT-II.B.1 ENT-II.B.2 ENT-II.C.1 ENT-II.C.2 ENT-VI.D.1 ENT-VI.D.2 ENT-VI.D.3 ENT-IX.1 ENT-IX.2	
2. Determine the steps needed to solve a problem				A-APR.1 A-APR.6 A-REI.1 A-REI.2 A-REI.3 A-REI.4	IT-X.3 IT-X.4 COMP-I.1 COMP-II.1 COMP-II.2 COMP-III.1	3

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				N-RN.2 N-Q.1 N-Q.2 N-Q.3 N-VM.6 N-VM.12 RST.11-12.1 RST.11-12.2 RST.11-12.3 RST.11-12.4 RST.11-12.5 RST.11-12.6 RST.11-12.7 RST.11-12.8 RST.11-12.9 RST.11-12.10	COMP-III.2 COMP-IV.1 COMP-IV.2 COMP-IV.3 COMP-V.2 COMP-V.3 COMP-V.4 MGMT-I.A.1 MGMT-I.A.2 MGMT-I.A.3 MGMT-I.B.1 MGMT-I.B.2 MGMT-I.B.3 MGMT-I.D.1 MGMT-I.D.2 MGMT-I.D.3	
3. Create an algorithm to solve a problem				S-ID.8 S-MD.5 S-MD.6 S-MD.7 S-MD.8 G-GMD.3 F-BF.1 F-BF.2 A-APR.1 A-APR.6 A-CED.1 A-CED.4 A-REI.1 A-REI.2 A-REI.3 A-REI.4 N-RN.2	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 COMP-IV.1 COMP-IV.2 COMP-IV.3 COMP-V.2	4

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				N-Q.1 N-Q.2 N-Q.3 N-VM.6 N-VM.12	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	
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<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 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 COMP-VI.A.4</p>	<p>3</p>
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					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	
5. Build a program from a storyboard, flowchart, or pseudocode					IT-IV.1 IT-IV.2 IT-IV.3	4

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					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	
6. Explain how to create and integrate reusable component into a program				RI.11-12.1 RI.11-12.2 RI.11-12.3 RI.11-12.4 RI.11-12.5 RI.11-12.6 RI.11-12.7	IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-X.3 IT-X.4 IT-XI.2	3

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				RI.11-12.10	IT-XI.3	
				W.11-12.1	IT-XI.4	
				W.11-12.2	IT-XIII.2	
				W.11-12.4	IT-XIII.3	
				W.11-12.5	IT-XIII.4	
				W.11-12.6	IT-XVIII.1	
				W.11-12.7	IT-XVIII.2	
				W.11-12.8	IT-XVIII.3	
				W.11-12.9	IT-XVIII.4	
				SL.11-12.1	COMM-I.A.1	
				SL.11-12.2	COMM-I.A.2	
				SL.11-12.3	COMM-I.A.3	
				SL.11-12.4	COMM-I.A.4	
				SL.11-12.5	COMM-I.B.1	
				SL.11-12.6	COMM-I.B.2	
				L.11-12.1	COMM-I.B.3	
				L.11-12.2	COMM-I.B.4	
				L.11-12.3	COMM-I.C.1	
				L.11-12.4	COMM-I.C.2	
				L.11-12.5	COMM-I.C.3	
				L.11-12.6	COMM-I.C.4	
				RST.11-12.1	COMP-I.1	
				RST.11-12.2	COMP-II.1	
				RST.11-12.3	COMP-II.2	
				RST.11-12.4	COMP-III.1	
				RST.11-12.5	COMP-III.2	
				RST.11-12.6	COMP-IV.1	
				RST.11-12.7	COMP-IV.2	
				RST.11-12.8	COMP-IV.3	
				RST.11-12.9	COMP-V.2	
				RST.11-12.10	COMP-V.3	
				WHST.11-12.1	COMP-V.4	
				WHST.11-12.2	COMP-VI.A.3	

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				WHST.11-12.4 WHST.11-12.5 WHST.11-12.6 WHST.11-12.7 WHST.11-12.8 WHST.11-12.9	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	
7. Explain how a program is tested and accepted for release				RI.11-12.1 RI.11-12.2 RI.11-12.3	IT-I.1 IT-I.2 IT-I.3	3

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				RI.11-12.4	IT-I.4	
				RI.11-12.5	IT-X.3	
				RI.11-12.6	IT-X.4	
				RI.11-12.7	IT-XI.2	
				RI.11-12.10	IT-XI.3	
				W.11-12.1	IT-XI.4	
				W.11-12.2	IT-XVIII.1	
				W.11-12.4	IT-XVIII.2	
				W.11-12.5	IT-XVIII.3	
				W.11-12.6	IT-XVIII.4	
				W.11-12.7	COMM-I.A.1	
				W.11-12.8	COMM-I.A.2	
				W.11-12.9	COMM-I.A.3	
				SL.11-12.1	COMM-I.A.4	
				SL.11-12.2	COMM-I.B.1	
				SL.11-12.3	COMM-I.B.2	
				SL.11-12.4	COMM-I.B.3	
				SL.11-12.5	COMM-I.B.4	
				SL.11-12.6	COMM-I.C.1	
				L.11-12.1	COMM-I.C.2	
				L.11-12.2	COMM-I.C.3	
				L.11-12.3	COMM-I.C.4	
				L.11-12.4		
				L.11-12.5		
				L.11-12.6		
				RST.11-12.1		
				RST.11-12.2		
				RST.11-12.3		
				RST.11-12.4		
				RST.11-12.5		
				RST.11-12.6		
				RST.11-12.7		
				RST.11-12.8		

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				RST.11-12.9 RST.11-12.10 WHST.11-12.1 WHST.11-12.2 WHST.11-12.4 WHST.11-12.5 WHST.11-12.6 WHST.11-12.7 WHST.11-12.8 WHST.11-12.9		
8. Document code.				L.11-12.1 L.11-12.2 L.11-12.3 L.11-12.4 L.11-12.5 L.11-12.6	IT-XI.2 IT-XI.3 IT-XI.4	2
ASSESSMENT DESCRIPTIONS*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc.) Two Class Video PSAs-one serious and one funny (summative) Flowcharting and pseudo design projects (formative and summative) Students create flowcharts/pseudo components (formative and summative) UserReqLab.doc – students actually interview “customers” and develop the user requirements for the project (summative) *Attach Unit Summative Assessment, including Scoring Guides/Scoring Keys/Alignment Codes and DOK Levels for all items. Label each assessment according to the unit descriptions above (i.e., Grade Level/Course Title/Course Code, Unit #.)						
Obj. #	INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)					
3,4,5,6	1. Lecture/demonstration; Independent Learning					

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1, 2	2. Lecture
7	3. Cooperative Learning
8	4. Independent Learning
Obj. #	INSTRUCTIONAL ACTIVITIES: (What Students Do)
3,4,5,6	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: (include internet addresses for linking)	