

## DESE Model Curriculum

GRADE LEVEL/UNIT TITLE: 11-12/Apply Data Structures Concepts

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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<b>UNIT DESCRIPTION:</b> Students will learn how to create organized data structures.		<b>SUGGESTED UNIT TIMELINE:</b> ?? WEEKS				
		<b>CLASS PERIOD (min.):</b> ?? MINUTES				
<b>ESSENTIAL QUESTIONS:</b>						
<ol style="list-style-type: none"> <li>1. What is a data structure?</li> <li>2. What is the benefit of a Database compared to a File?</li> <li>3. Why is it important to create efficient data structures?</li> </ol>						
ESSENTIAL MEASURABLE LEARNING OBJECTIVES	CCSS LEARNING GOALS (Anchor Standards/Clusters)	CROSSWALK TO STANDARDS				
		GLEs/CLÉs	PS	CCSS	OTHER	DOK
1. Create a program using a list				S-ID.8 S-MD.5 S-MD.6 S-MD.7 S-MD.8 G-SRT.8 G-GPE.7 G-GMD.3 G-MG.2 F-BF.1 F-BF.2 A-SSE.4 A-APR.1 A-APR.6 A-CED.1 A-CED.4 A-REI.1 A-REI.2	IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.4 IT-XIV.1 IT-XIV.2 IT-XIII.1 IT-XIII.2 IT-XIII.3 IT-XIII.4 COMP-I.1 COMP-II.1 COMP-II.2	<b>4</b>

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				<p><b>A-REI.3</b>  <b>A-REI.4</b>  <b>RST.11-12.1</b>  <b>RST.11-12.2</b>  <b>RST.11-12.3</b>  <b>RST.11-12.4</b>  <b>RST.11-12.5</b>  <b>RST.11-12.6</b>  <b>RST.11-12.7</b>  <b>RST.11-12.8</b>  <b>RST.11-12.9</b>  <b>RST.11-12.10</b></p>	<p><b>COMP-III.1</b>  <b>COMP-III.2</b>  <b>COMP-IV.1</b>  <b>COMP-IV.2</b>  <b>COMP-IV.3</b>  <b>COMP-V.2</b>  <b>COMP-V.3</b>  <b>COMP-V.4</b>  <b>COMP-VI-</b>  <b>A.3</b>  <b>COMP-VI-</b>  <b>A.4</b>  <b>COMP-VI-B.1</b>  <b>COMP-VI-B.2</b>  <b>COMP-VI-B.3</b>  <b>COMP-VI-B.4</b>  <b>COMP-VI-C.1</b>  <b>COMP-VI-C.2</b>  <b>COMP-VI-C.3</b>  <b>COMP-VI-</b>  <b>D.1</b>  <b>COMP-VI-</b>  <b>D.2</b>  <b>COMP-VI-</b>  <b>D.3</b>  <b>COMP-VI-E.3</b>  <b>COMP-VI-E.4</b>  <b>COMP-VI-F.2</b>  <b>COMP-VI-F.3</b>  <b>COMP-VI-F.4</b>  <b>COMP-VI-</b>  <b>G.1</b></p>	
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					COMP-VI-G.2 COMP-VI-G.3 COMP-VI-H.1 COMP-VI-H.2 COMP-VI-H.3 COMP-VI-H.4 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	
2. Create a program using one- and two-dimensional arrays				S-ID.8 S-MD.5 S-MD.6 S-MD.7 S-MD.8 G-SRT.8 G-GPE.7 G-GMD.3 G-MG.2 F-BF.1 F-BF.2	IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.4 IT-XIV.1 IT-XIV.2	<b>4</b>

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				<p>A-SSE.4  A-APR.1  A-APR.6  A-CED.1  A-CED.4  A-REI.1  A-REI.2  A-REI.3  A-REI.4  A-REI.9  A-REI.10  N.VM.6  N.VM.8  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</p>	<p>IT-XIII.1  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  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</p>	
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					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-H.4 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. Create a program using a sort routine				S-ID.8 S-MD.5 S-MD.6 S-MD.7	IT-X.3 IT-X.4 IT-XI.2 IT-XI.3	<b>4</b>

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				<p>S-MD.8  G-SRT.8  G-GPE.7  G-GMD.3  G-MG.2  F-BF.1  F-BF.2  A-SSE.4  A-APR.1  A-APR.6  A-CED.1  A-CED.4  A-REI.1  A-REI.2  A-REI.3  A-REI.4  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</p>	<p>IT-XI.4  IT-XVI.1  IT-XVI.2  IT-XVI.3  IT-XVI.4  IT-XIV.1  IT-XIV.2  IT-XIII.1  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  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</p>	
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					<p><b>COMP-VI-C.3</b>  <b>COMP-VI-D.1</b>  <b>COMP-VI-D.2</b>  <b>COMP-VI-D.3</b>  <b>COMP-VI-E.3</b>  <b>COMP-VI-E.4</b>  <b>COMP-VI-F.2</b>  <b>COMP-VI-F.3</b>  <b>COMP-VI-F.4</b>  <b>COMP-VI-G.1</b>  <b>COMP-VI-G.2</b>  <b>COMP-VI-G.3</b>  <b>COMP-VI-H.1</b>  <b>COMP-VI-H.2</b>  <b>COMP-VI-H.3</b>  <b>COMP-VI-H.4</b>  <b>COMP-VI-I.3</b>  <b>COMP-VI-I.4</b>  <b>COMP-VI-J.3</b>  <b>COMP-VI-J.4</b>  <b>COMP-VI-K.2</b>  <b>COMP-VI-K.3</b></p>
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					COMP-VI-L.3 COMP-VI-M.3	
4. Create file structures				<b>8.SP.4</b> <b>7.SP.8</b> <b>RST.11-12.1</b> <b>RST.11-12.2</b> <b>RST.11-12.3</b> <b>RST.11-12.4</b> <b>RST.11-12.5</b> <b>RST.11-12.6</b> <b>RST.11-12.7</b> <b>RST.11-12.8</b> <b>RST.11-12.9</b> <b>RST.11-12.10</b>	<b>IT-IX.1</b> <b>IT-IX.2</b> <b>IT-IX.3</b> <b>IT-IX.4</b>	<b>4</b>
5. Describe database structures (e.g., fields, records, files, and tables)				<b>8.SP.4</b> <b>RI.11-12.1</b> <b>RI.11-12.2</b> <b>RI.11-12.3</b> <b>RI.11-12.4</b> <b>RI.11-12.5</b> <b>RI.11-12.6</b> <b>RI.11-12.7</b> <b>RI.11-12.10</b> <b>W.11-12.1</b> <b>W.11-12.2</b> <b>W.11-12.4</b> <b>W.11-12.5</b> <b>W.11-12.6</b> <b>W.11-12.7</b> <b>W.11-12.8</b> <b>W.11-12.9</b>	<b>IT-IX.1</b> <b>IT-IX.2</b> <b>IT-IX.3</b> <b>IT-IX.4</b> <b>COMM-I.A.1</b> <b>COMM-I.A.2</b> <b>COMM-I.A.3</b> <b>COMM-I.A.4</b> <b>COMM-I.B.1</b> <b>COMM-I.B.2</b> <b>COMM-I.B.3</b> <b>COMM-I.B.4</b> <b>COMM-I.C.1</b> <b>COMM-I.C.2</b> <b>COMM-I.C.3</b> <b>COMM-I.C.4</b> <b>COMM-I.D.1</b>	<b>1</b>

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				<b>W.11-12.10</b> <b>SL.11-12.1</b> <b>SL.11-12.2</b> <b>SL.11-12.3</b> <b>SL.11-12.4</b> <b>SL.11-12.5</b> <b>SL.11-12.6</b> <b>L.11-12.1</b> <b>L.11-12.2</b> <b>L.11-12.3</b> <b>L.11-12.4</b> <b>L.11-12.5</b> <b>L.11-12.6</b> <b>RST.11-12.1</b> <b>RST.11-12.2</b> <b>RST.11-12.3</b> <b>RST.11-12.4</b> <b>RST.11-12.5</b> <b>RST.11-12.6</b> <b>RST.11-12.7</b> <b>RST.11-12.8</b> <b>RST.11-12.9</b> <b>RST.11-12.10</b> <b>WHST.11-12.1</b> <b>WHST.11-12.2</b> <b>WHST.11-12.4</b> <b>WHST.11-12.5</b> <b>WHST.11-</b>	<b>COMM-I.D.2</b> <b>COMM-I.D.3</b> <b>COMM-I.D.4</b> <b>COMM-</b> <b>III.E.3</b> <b>COMM-IV.1</b> <b>COMM-IV.2</b> <b>COMM-IV.3</b> <b>COMM-IV.4</b>	
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				12.6 WHST.11- 12.7 WHST.11- 12.8 WHST.11- 12.9		
6. Write code to append, delete, and update a table or a file				S-ID.8 S-MD.5 S-MD.6 S-MD.7 S-MD.8 G-SRT.8 G-GPE.7 G-GMD.3 G-MG.2 F-BF.1 F-BF.2 A-SSE.4 A-APR.1 A-APR.6 A-CED.1 A-CED.4 A-REI.1 A-REI.2 A-REI.3 A-REI.4 RST.11-12.1 RST.11-12.2 RST.11-12.3 RST.11-12.4 RST.11-12.5	IT-IX.1 IT-IX.2 IT-IX.3 IT-IX.4 IT-X.3 IT-X.4 IT-XI.2 IT-XI.3 IT-XI.4 IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.4 IT-XIV.1 IT-XIV.2 IT-XIII.1 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	4

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				<b>RST.11-12.6</b> <b>RST.11-12.7</b> <b>RST.11-12.8</b> <b>RST.11-12.9</b> <b>RST.11-12.10</b>	<b>COMP-IV.2</b> <b>COMP-IV.3</b> <b>COMP-V.2</b> <b>COMP-V.3</b> <b>COMP-V.4</b> <b>COMP-VI-</b> <b>A.3</b> <b>COMP-VI-</b> <b>A.4</b> <b>COMP-VI-B.1</b> <b>COMP-VI-B.2</b> <b>COMP-VI-B.3</b> <b>COMP-VI-B.4</b> <b>COMP-VI-C.1</b> <b>COMP-VI-C.2</b> <b>COMP-VI-C.3</b> <b>COMP-VI-</b> <b>D.1</b> <b>COMP-VI-</b> <b>D.2</b> <b>COMP-VI-</b> <b>D.3</b> <b>COMP-VI-E.3</b> <b>COMP-VI-E.4</b> <b>COMP-VI-F.2</b> <b>COMP-VI-F.3</b> <b>COMP-VI-F.4</b> <b>COMP-VI-</b> <b>G.1</b> <b>COMP-VI-</b> <b>G.2</b> <b>COMP-VI-</b>	
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					<b>G.3</b> <b>COMP-VI-</b> <b>H.1</b> <b>COMP-VI-</b> <b>H.2</b> <b>COMP-VI-</b> <b>H.3</b> <b>COMP-VI-</b> <b>H.4</b> <b>COMP-VI-I.3</b> <b>COMP-VI-I.4</b> <b>COMP-VI-J.3</b> <b>COMP-VI-J.4</b> <b>COMP-VI-K.2</b> <b>COMP-VI-K.3</b> <b>COMP-VI-L.3</b> <b>COMP-VI-</b> <b>M.3</b>	
7. Create a database file with one or more tables for manipulation by program code				<b>RST.11-12.1</b> <b>RST.11-12.2</b> <b>RST.11-12.3</b> <b>RST.11-12.4</b> <b>RST.11-12.5</b> <b>RST.11-12.6</b> <b>RST.11-12.7</b> <b>RST.11-12.8</b> <b>RST.11-12.9</b> <b>RST.11-12.10</b>	<b>IT-IX.1</b> <b>IT-IX.2</b> <b>IT-IX.3</b> <b>IT-IX.4</b>	<b>4</b>
8. Write code to search, sort, and query a data structure				<b>S-ID.8</b> <b>S-MD.5</b> <b>S-MD.6</b> <b>S-MD.7</b>	<b>IT-IX.1</b> <b>IT-IX.2</b> <b>IT-IX.3</b> <b>IT-IX.4</b>	<b>4</b>

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				<p>S-MD.8  G-SRT.8  G-GPE.7  G-GMD.3  G-MG.2  F-BF.1  F-BF.2  A-SSE.4  A-APR.1  A-APR.6  A-CED.1  A-CED.4  A-REI.1  A-REI.2  A-REI.3  A-REI.4  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</p>	<p>IT-X.3  IT-X.4  IT-XI.2  IT-XI.3  IT-XI.4  IT-XVI.1  IT-XVI.2  IT-XVI.3  IT-XVI.4  IT-XIV.1  IT-XIV.2  IT-XIII.1  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  COMP-V.3  COMP-V.4  COMP-VI-  A.3  COMP-VI-  A.4  COMP-VI-B.1  COMP-VI-B.2</p>	
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					<p><b>COMP-VI-B.3</b>  <b>COMP-VI-B.4</b>  <b>COMP-VI-C.1</b>  <b>COMP-VI-C.2</b>  <b>COMP-VI-C.3</b>  <b>COMP-VI-</b>  <b>D.1</b>  <b>COMP-VI-</b>  <b>D.2</b>  <b>COMP-VI-</b>  <b>D.3</b>  <b>COMP-VI-E.3</b>  <b>COMP-VI-E.4</b>  <b>COMP-VI-F.2</b>  <b>COMP-VI-F.3</b>  <b>COMP-VI-F.4</b>  <b>COMP-VI-</b>  <b>G.1</b>  <b>COMP-VI-</b>  <b>G.2</b>  <b>COMP-VI-</b>  <b>G.3</b>  <b>COMP-VI-</b>  <b>H.1</b>  <b>COMP-VI-</b>  <b>H.2</b>  <b>COMP-VI-</b>  <b>H.3</b>  <b>COMP-VI-</b>  <b>H.4</b>  <b>COMP-VI-I.3</b>  <b>COMP-VI-I.4</b></p>
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					<b>COMP-VI-J.3</b> <b>COMP-VI-J.4</b> <b>COMP-VI-K.2</b> <b>COMP-VI-K.3</b> <b>COMP-VI-L.3</b> <b>COMP-VI-M.3</b>
<p><b>ASSESSMENT DESCRIPTIONS*:</b> (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc. )</p> <p>Included assessments: SQL Quiz (with answers) – (formative)</p> <p>Database labs and arrays projects also included (formative/summative)</p> <p><b>*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 #.)</b></p>					
<b>Obj. #</b>	<b>INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)</b>				
2,5,6,7,8	1. Lecture, Discussion				
4	2. Lecture, Discussion				
1, 3	3. Lecture				
<b>Obj. #</b>	<b>INSTRUCTIONAL ACTIVITIES: (What Students Do)</b>				
2,5,6,7,8	1. Database Terminology lecture/discussion				
4	2. SQL Lecture discussion				
1, 3	3. Other programming concepts based upon the language				
<b>UNIT RESOURCES: (include internet addresses for linking)</b>					