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| **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? | | | | | | | | |
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| **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**  **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** | 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**  **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** | **4** |
| 1. 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**  **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** | IT-X.3  IT-X.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**  **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** |
| 1. 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**  **N-Q.1**  **N-Q.2**  **N-Q.3**  **N-VM.6**  **N-VM.12** | 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**  **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 | **4** |
| 1. Illustrate the problem solution using a storyboard, flowchart or pseudocode | |  |  | |  |  | 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  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** |
| 1. 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** |
| 1. 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**  **RI.11-12.10**  **W.11-12.1**  **W.11-12.2**  **W.11-12.4**  **W.11-12.5**  **W.11-12.6**  **W.11-12.7**  **W.11-12.8**  **W.11-12.9**  **SL.11-12.1**  **SL.11-12.2**  **SL.11-12.3**  **SL.11-12.4**  **SL.11-12.5**  **SL.11-12.6**  **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**  **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** | 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** |
| 1. Explain how a program is tested and accepted for release | |  |  | |  | **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**  **W.11-12.1**  **W.11-12.2**  **W.11-12.4**  **W.11-12.5**  **W.11-12.6**  **W.11-12.7**  **W.11-12.8**  **W.11-12.9**  **SL.11-12.1**  **SL.11-12.2**  **SL.11-12.3**  **SL.11-12.4**  **SL.11-12.5**  **SL.11-12.6**  **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**  **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** | 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** |
| 1. 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** | | | | | | | |
| 1, 2 | 1. **Lecture** | | | | | | | |
| 7 | 1. **Cooperative Learning** | | | | | | | |
| 8 | 1. **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-reusuable-code - lecture/discussion starting point** | | | | | | | |
| **UNIT RESOURCES: (include internet addresses for linking)** | | | | | | | | |