|  |
| --- |
| **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: 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****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.3IT-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.3IT-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.3IT-X.4IT-XI.2IT-XI.3IT-XI.4IT-XIII.2IT-XIII.3IT-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.3COMP-VI.A.4COMP-VI.B.1COMP-VI.B.2COMP-VI.B.3COMP-VI.B.4COMP-VI.C.1COMP-VI.C.2COMP-VI.C.3COMP-VI.D.1COMP-VI.D.2COMP-VI.D.3COMP-VI.E.3COMP-VI.E.4COMP-VI.F.2COMP-VI.F.3COMP-VI.F.4COMP-VI.G.1COMP-VI.G.2COMP-VI.G.3COMP-VI.H.1COMP-VI.H.2COMP-VI.H.3COMP-VI.I.3COMP-VI.I.4COMP-VI.J.3COMP-VI.J.4COMP-VI.K.2COMP-VI.K.3COMP-VI.L.3COMP-VI.M.3 | **4** |
| 1. Illustrate the problem solution using a storyboard, flowchart or pseudocode
 |  |  |  |  | IT-I.1IT-I.2IT-I.3IT-I.4IT-IV.1IT-IV.2IT-IV.3IT-IV.4IT-X.3IT-X.4IT-XI.2IT-XI.3IT-XI.4IT-XIII.2IT-XIII.3IT-XIII.4IT-XVIII.1IT-XVIII.2IT-XVIII.3IT-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.3COMP-VI.A.4COMP-VI.B.1COMP-VI.B.2COMP-VI.B.3COMP-VI.B.4COMP-VI.C.1COMP-VI.C.2COMP-VI.C.3COMP-VI.D.1COMP-VI.D.2COMP-VI.D.3COMP-VI.E.3COMP-VI.E.4COMP-VI.F.2COMP-VI.F.3COMP-VI.F.4COMP-VI.G.1COMP-VI.G.2COMP-VI.G.3COMP-VI.H.1COMP-VI.H.2COMP-VI.H.3COMP-VI.I.3COMP-VI.I.4COMP-VI.J.3COMP-VI.J.4COMP-VI.K.2COMP-VI.K.3COMP-VI.L.3COMP-VI.M.3 | **3** |
| 1. Build a program from a storyboard, flowchart, or pseudocode
 |  |  |  |  | IT-IV.1IT-IV.2IT-IV.3IT-IV.4IT-X.3IT-X.4IT-XI.2IT-XI.3IT-XI.4IT-XIII.2IT-XIII.3IT-XIII.4IT-XVIII.1IT-XVIII.2IT-XVIII.3IT-XVIII.4MGMT-IV.A.1MGMT-IV.A.2MGMT-IV.A.3MGMT-IV.A.4MGMT-IV.B.1MGMT-IV.B.2MGMT-IV.B.3MGMT-VIII.A.1MGMT-VIII.A.2MGMT-VIII.A.3MGMT.VIII.A.4MGMT-XI.A.3MGMT-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.1IT-I.2IT-I.3IT-I.4IT-X.3IT-X.4IT-XI.2IT-XI.3IT-XI.4IT-XIII.2IT-XIII.3IT-XIII.4IT-XVIII.1IT-XVIII.2IT-XVIII.3IT-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.3COMP-VI.A.4COMP-VI.B.1COMP-VI.B.2COMP-VI.B.3COMP-VI.B.4COMP-VI.C.1COMP-VI.C.2COMP-VI.C.3COMP-VI.D.1COMP-VI.D.2COMP-VI.D.3COMP-VI.E.3COMP-VI.E.4COMP-VI.F.2COMP-VI.F.3COMP-VI.F.4COMP-VI.G.1COMP-VI.G.2COMP-VI.G.3COMP-VI.H.1COMP-VI.H.2COMP-VI.H.3COMP-VI.I.3COMP-VI.I.4COMP-VI.J.3COMP-VI.J.4COMP-VI.K.2COMP-VI.K.3COMP-VI.L.3COMP-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.1IT-I.2IT-I.3IT-I.4IT-X.3IT-X.4IT-XI.2IT-XI.3IT-XI.4IT-XVIII.1IT-XVIII.2IT-XVIII.3IT-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.2IT-XI.3IT-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)** |