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

GRADE LEVEL/UNIT TITLE: 11-12/Explore Computer Concepts

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 about the history of technology and the impact on society.	2 weeks
	CLASS PERIOD (min.)
	50 min.

ESSENTIAL QUESTIONS

1. How do the components of a Computer represent a system?
2. What is the impact of operating systems on application programs?
3. How does technology impact society?

ESSENTIAL MEASURABLE LEARNING OBJECTIVES	**NBEA STANDARD**				**DOK**
1. Trace the development of computers and their impact on society	IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-IX.1 IT-XVI.1	IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2 COMM-I.D.3	COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	3
2. Describe the categories and evolution of programming languages	IT-I.1 IT-I.2 IT-I.3 IT-I.4 IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-IX.1 IT-X.1 IT-X.2	IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2 COMM-I.D.3	COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	2

3. Explain the functions of computer hardware and architecture	IT-II.1 IT-II.2 IT-II.3 IT-II.4 IT-VIII.1 IT-VIII.2 IT-VIII.3 IT.IX.1 IT.XII.1 IT.XII.2	IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2	COMM-I.D.3 COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	1
4. Demonstrate an understanding of computer theory (e.g., bits, bytes, binary logic, memory, and storage)	IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-IX.1 IT-IX.2 IT-X.1 IT-X.2 IT-XVI.1 IT-XVI.2	IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2 COMM-I.D.3 COMM-I.D.4	COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4 MGMT-VIII.A.1	4
5. Compare computer operating systems (e.g., DOS, Windows, Linux, Android)	IT-III.1 IT-III.2 IT-III.3 IT-III.4 IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-IX.1 IT-XVI.1	IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2 COMM-I.D.3	COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	3
6. Discuss legal/ethical issues related to computers	IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-XV.1 IT-XV.2 IT.XV.3	IT-XVI.3 IT-XVI.4 COMM-I.A.1 COMM-I.A.2 COMM-I.A.3 COMM-I.A.4	COMM-I.B.4 COMM-I.C.1 COMM-I.C.2 COMM-I.C.3 COMM-I.C.4 COMM-I.D.1	COMM-II.B.1 COMM-II.B.2 COMM-III.E.3 COMM-III.E.4 COMM-IV.1 COMM-IV.2	2

	IT.XV.4 IT-XVI.1 IT-XVI.2	COMM-I.B.1 COMM-I.B.2 COMM-I.B.3	COMM-I.D.2 COMM-I.D.3 COMM-I.D.4	COMM-IV.3 COMM-IV.4	
7. Identify the application environment/interface for the specific language being covered (e.g., JCreator, BlueJay, and Visual Studio)	IT-IV.1 IT-IV.2 IT-IV.3 IT-IV.4 IT-V.1 IT-V.2 IT-V.3 IT-V.4 IT-VI.1 IT-VI.2	IT-VI.3 IT-VI.4 IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1	COMM-I.D.2 COMM-I.D.3 COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	1
8. Explain the concept of security and its relationship to programming	IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-XIV.1 IT-XIV.2 IT-XIV.3 IT-XIV.4 IT-XVI.1 IT-XVI.2	IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2 COMM-I.D.3	COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	2
9. Identify components of the information system model (input, process, output, storage)	IT-IV.1 IT-IV.2 IT-IV.3 IT-IV.4 IT-VIII.1 IT-VIII.2 IT-VIII.3 IT-X.3 IT-X.4	IT-XVI.1 IT-XVI.2 IT-XVI.3 IT-XVI.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 COMM-I.D.1 COMM-I.D.2	COMM-I.D.3 COMM-I.D.4 COMM-II.B.1 COMM-II.B.2 COMM-IV.1 COMM-IV.2 COMM-IV.3 COMM-IV.4	1
10. Identify types of Network (Internet, LANs, and Wireless)	IT-II.1 IT-II.2 IT-II.3	IT-III.2 IT-III.3 IT-III.4	IT-VIII.3 IT-XII.2 IT-XII.3	IT-XVI.3 IT-XVI.4	1

	IT-II.4 IT-III.1	IT-VIII.1 IT-VIII.2	IT-XVI.1 IT-XVI.2	

ASSESSMENT DESCRIPTIONS	
1. Short quizzes in the BinaryHex folder (formative) 2. Hardware Project that is research and presentation (summative) 3. Ethics assignment that is primarily group discussion (formative)	
OBJ. #	**INSTRUCTIONAL STRATEGIES**
2, 3, 6, 7, 9, 10	1. Lecture
1	2. Video/movie
4	3. Independent Learning
5	4. Demonstration, cooperative learning
8	5. Lecture, demonstration, discussion, research
OBJ. #	**INSTRUCTIONAL ACTIVITIES**
2, 3, 6, 7, 9, 10	1. Lecture using Computer Logic & Logic Operators ppt, Ethics ppt, Parts and types of computers ppt, terminology and types of software ppt and associated notes files.
1	2. Cambridge Education History of computers video and the teacher resource for the movie
4	3. Binary/Hex folder includes power points for practice and explanation and NASA Binary activity and Egg Carton Binary activity
5	4. OSLesson and Comparing OS lecture/demonstration/activity for the students
8	5. Program Development Security – demonstration/discussion/lecture with a student research activity
UNIT RESOURCES	
n/a	