

**ARTICULATION AGREEMENT**

**DATE DRAFTED:** September 25, 2017

**VALID ACADEMIC YEARS:** 2017-18 & 2018-19

**LMC COURSE:** COMSC-122 Programming Concepts & Methodologies

**HIGH SCHOOL COURSE:** AP Computer Science

**School:** Antioch High School

**Address:** 700 W. 18<sup>th</sup> St Antioch, CA 94509

**A. COLLEGE COURSE DESCRIPTION:** This course introduces the discipline of computer science with practical hands-on problem solving using a “high-level” computer programming language. The course will include basic syntax and semantics of a “high-level” language, variables, types, expressions, assignment, basic computation, simple I/O, conditional and iterative control structures, functions and parameter passing, structured decomposition, program design, programming style, algorithms and problem solving strategies, overview of programming languages, binding, visibility, scoping, and lifetime management.

**B. UNITS: 3**

**C. PRE-REQUISITES: NA**

**D. REQUIRED CONTENT FOR ARTICULATION:**

**Fundamental programming constructs (45%)**

1. Basic syntax and semantics of a higher-level language
2. Variables, types, expressions, and assignment
3. Simple I/O
4. Conditional and iterative control structures
5. Functions and parameter passing
6. Structured decomposition

**Algorithms and problem-solving (45%)**

1. Problem-solving strategies
2. The role of algorithms in the problem-solving process
3. Implementation strategies for algorithms
4. Debugging strategies
5. The concept and properties of algorithms

**Overview of programming languages (5%)**

1. History of programming languages
2. Brief survey of programming paradigms
3. Procedural languages
4. Object-oriented languages

### **Declarations and types (5%)**

1. The conception of types as a set of values together with a set of operations Declaration models (binding, visibility, scope, and lifetime)
2. Overview of type-checking

### **E. REQUIRED COMPETENCIES (PERFORMANCE OBJECTIVES) FOR ARTICULATION**

By the end of the first semester, Students will:

1. Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.
2. Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.
3. Summarize the evolution of programming languages illustrating how this history has led to the paradigms available today.
4. Demonstrate different forms of binding, visibility, scoping, and lifetime management.

### **F. METHODS FOR END OF COURSE ASSESSMENT:**

Credit by exam: Students must receive a grade of “B” or better on the final exam

The primary form of assessment in this course is problem based assessment. Students will be presented with challenge problems and will be required to submit solutions in the form of computer programs. The challenge problems and solutions are progressively more difficult as the students learn more concepts and techniques to build their computational skills. Students enhance their previous learning and add new skills to solve the progressively challenging program challenges.

**Programming Challenges (problem based assessment):** On homework assignments, students demonstrate the ability to develop solutions to assigned problems by writing computer programs using a “high-level” computer programming language and then testing and verifying their solutions on a computer.

**Exams:** On the exam questions students will demonstrate knowledge of the programming concepts and techniques, and the syntax of the programming language via multiple choice and short response questions.

#### **Method of Evaluation/Grading:**

A-level student’s work is complete, accurate, well-organized, and submitted on time. Computer programs are constructed with minimal or no errors and meet all of the problem specifications. The A-level solutions are well documented and brief, yet still meet all the requirements. The A-level solution will take advantage of the appropriate programming concepts and techniques that have been learned to-date.

### **G. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:**

1. Complete the Introduction AP Computer Science course at Antioch High School with a grade of “B” or better.
2. Complete the LMC “Credit by Exam” procedure with a grade of “B” or better.
3. Apply for admission at Los Medanos College.
4. Register for CATEMA for electronic submission of college credit **OR** obtain copy of high school transcript and articulation agreement and submit to the LMC Office of Admissions & Records.

5. Upon completion of the above, the student will receive on his/her LMC and CCCC (California Community College District) transcripts the unit credit for LMC's Programming Concepts & Methodologies course.

**H. TEXTBOOKS OR OTHER SUPPORTING MATERIALS**

- a. Cook, Charles E.; Blue Pelican Java, version 7.0.1a, Refugio, Tx, 2013.  
 b. Java Fundamentals, [www.sololearn.com](http://www.sololearn.com), Pleasanton, CA.

**COLLEGE SIGNATURES**

Kevin P. Horan Sep 29, 2017  
Kevin P. Horan (Sep 29, 2017)  
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 Kevin Horan Date  
 LMC Vice President of Instruction & Student Services

Ryan Pedersen Sep 29, 2017  
Ryan Pedersen (Sep 29, 2017)  
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 Ryan Pedersen Date  
 LMC Interim Dean of Mathematics & Sciences

Louie m. Giambattista Sep 28, 2017  
Louie m. Giambattista (Sep 28, 2017)  
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 Louis Giambattista Date  
 LMC Computer Science Department Chair

**HIGH SCHOOL/ROP/DISTRICT SIGNATURES**

Louis Rocha Oct 4, 2017  
Louis Rocha (Oct 4, 2017)  
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 Louis Rocha Date  
 Principal, Antioch High School

Michael Santos/Andy Cannon Oct 5, 2017  
Michael Santos/Andy Cannon (Oct 5, 2017)  
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 Mike Santos, Ed. D. Date  
 Director, Program Improvement/Secondary Education

Kent McCutcheon Oct 2, 2017  
Kent McCutcheon (Oct 2, 2017)  
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 Kent McCutcheon Date  
 Faculty, Antioch High School



**Cc: Robin Armour, LMC Director of Admissions and Records**  
**Kelly Green, LMC K-12 Liaison**  
**Tiffany Welter, LMC CTE Counselor**  
**School District Educational Services Dept.**  
**High School Principal**  
**High School CATEMA Contact**  
**Upload: LMC High School Articulation webpage**  
**StatewidePathways.Org**