

KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York

CURRICULUM TRANSMITTAL COVER PAGE

Department: Math and Computer Science Date: 01/14/2019

Title Of Course/Degree/Concentration/Certificate: Introduction to Computing (CS 1200)

Change(s) Initiated: (Please check)

- | | |
|-------------------------------------------------------|------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Closing of Degree | <input type="checkbox"/> Change in Degree or Certificate |
| <input type="checkbox"/> Closing of Certificate | <input type="checkbox"/> Change in Degree: Adding Concentration |
| <input type="checkbox"/> New Certificate Proposal | <input type="checkbox"/> Change in Degree: Deleting Concentration |
| <input type="checkbox"/> New Degree Proposal | <input type="checkbox"/> Change in Prerequisite, Corequisite, and/or Pre/Co-requisite |
| <input type="checkbox"/> New Course | <input type="checkbox"/> Change in Course Designation |
| <input type="checkbox"/> New 82 Course (Pilot Course) | <input type="checkbox"/> Change in Course Description |
| <input type="checkbox"/> Deletion of Course(s) | <input checked="" type="checkbox"/> Change in Course Title, Number, Credits and/or Hours |
| | <input type="checkbox"/> Change in Academic Policy |
| | <input type="checkbox"/> Pathways Submission: |
| | <input type="checkbox"/> Life and Physical Science |
| | <input type="checkbox"/> Math and Quantitative Reasoning |
| | <input type="checkbox"/> A. World Cultures and Global Issues |
| | <input type="checkbox"/> B. U.S. Experience in its Diversity |
| | <input type="checkbox"/> C. Creative Expression |
| | <input type="checkbox"/> D. Individual and Society |
| | <input type="checkbox"/> E. Scientific World |
- Change in Program Learning Outcomes
- Other (please describe): _____

PLEASE ATTACH MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

DEPARTMENTAL ACTION

Action by Department and/or Departmental Committee, if required:

Date Approved: _____ Signature, Committee Chairperson: _____

If submitted Curriculum Action affects another Department, signature of the affected Department(s) is required:

Date Approved: 1/16/19 Signature, Department Chairperson: [Signature] *I am aware of this submission*

Date Approved: _____ Signature, Department Chairperson: _____

I have reviewed the attached material/proposal

Signature, Department Chairperson: R YauX 1/14/2019

Kingsborough Community College
The City University of New York

Modifications in Credits/Hours for an Existing Course Form

1. Course Number and Title:
Mathematics and Computer Science
CS 1200 - Introduction to Computing

2. This Course is **currently** listed as:

4 Credits 4 Hours (include break-down of lecture, lab, or gym)
4 Lecture Hours

3. **Proposed** Change in Credits/Hours (Please check **ONE** appropriate box below based on credits):

It is recommended that you refer to the "College Credits Assigned for Instructional Hours" PDF at
<http://kingsborough.edu/aa/Pages/forms.aspx>

Hours are hours per week in a typical 12-week semester

1-credit:	<input type="checkbox"/> 1 hour lecture <input type="checkbox"/> 2 hours lab/field/gym
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2-credits:	<input type="checkbox"/> 2 hours lecture <input type="checkbox"/> 1 hour lecture, 2 hours lab/field <input type="checkbox"/> 4 hours lab/field
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3-credits:	<input type="checkbox"/> 3 hours lecture <input checked="" type="checkbox"/> 2 hours lecture, 2 hours lab/field <input type="checkbox"/> 1 hour lecture, 4 hours lab/field <input type="checkbox"/> 6 hours lab/field
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4-credits:	<input type="checkbox"/> 4 hours lecture <input type="checkbox"/> 3 hours lecture, 2 hours lab/field <input type="checkbox"/> 2 hours lecture, 4 hours lab/field <input type="checkbox"/> 1 hour lecture, 6 hours lab/field <input type="checkbox"/> 8 hours lab/field
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More than 4-credits:	<input type="checkbox"/> Number of credits: ____ (explain mix lecture/lab below) ____ Lecture ____ Lab
Explanation:	_____

4. Rationale/Justification for the change in credits/hours for this course:

The change in number of credits reflects curricular adjustments to allow for 2 lab hours and 2 lecture hours, as reflected in the course syllabus.

5. Include the **Current** Syllabus/Topical Course Outline and the **Proposed** Syllabus/Topical Course Outline for the course. **Highlight** areas that have been modified and serve as the justification for the proposed change in credits/hours for the course.

See attachments.



TO: Spring 2019 Curriculum Committee
FROM: Department of Mathematics & Computer Science
DATE: 01/14/2019
RE: Change in Number of Course Credits for Introduction to Computing (CS 1200)

The Department of Mathematics & Computer Science is proposing a change in number of Course Credits for Introduction to Computing (CS 1200):

FROM:

4 credits, 4 hrs.

TO:

3 credits, 4 hrs. (2 lecture hrs., 2 hr. lab)

Rationale for Change: The change in number of credits reflects curricular adjustments to allow for 2 lab hours and 2 lecture hours, as reflected in the course syllabus.

Department of Mathematics & Computer Science

1. **Department, Course Number and Title**
Department of Mathematics & Computer Science, CS12 - Introduction to Computing
2. **Distribution Requirements for Groups I-V**
This course satisfies the Group V requirement.
3. **Demonstration of Course Transferability**
Course equivalencies for Kingsborough's CS 12 at Brooklyn, City, Lehman, NYC Technical, John Jay and Medgar Evers Colleges:
Brooklyn College: CIS 1.5 - Introduction to Computing Using the C++ Programming Language 4 cr.
City College: CSC 10200 - Introduction to Computing - 3cr.
Lehman College: COMP 230 - Programming Methods 1-4 cr.
NYC Technical College: CS101 - Computer Programming and Problem Solving - 3cr.
John Jay College: Mat271 - Introduction to Computing and Programming - 3cr.
Medgar Evers College: Introduction to Computing - 3 cr.
4. **Bulletin Description of Course**
Algorithms, programs, data representation, debugging and verification of programs. Numeric and non numeric programming applications include searching and sorting algorithms, function and procedures, and number theory problems.
5. **Number of Weekly Class Hours**
4 hours per week
6. **Number of Credits**
4 credits
7. **Prerequisites**
Corequisite: Math 14. Students who completed DP59 or CP 21 will not receive credit for CS12.
8. **Justification for Course and Expected Enrollment**
The language C++ is a standardized, industrial-strength programming language known for its power and portability. It is an excellent language for a first course in programming methods. It comes with many useful libraries, and is supported by sophisticated integrated environments. It is today's choice as the language most used for computer science instruction.

9. **Course Withdrawals**
None
10. **CPI Requirements**
As this course required Math 14 as a co-requisite, any student who takes it has fulfilled his CPI requirement in mathematics.
11. **Field Work, Internship or Independent Study**
N/A
12. **Textbooks**
Starting Out with C++: from Control Structures through Objects 7th Ed. By: Tony Gaddis, Published by: Addison Wesley: ISBN 978-0-13-257625-3, 2012
13. **Required Course for Majors**
Yes
14. **Specify If Course Is Open to Only Selected Students**
This course is only open to Computer Science majors who have the corequisites of Math 14 (Precalculus.)
15. **What Students Will Know and Be Able To Do Upon Completion of Course**
Students will be able to write programs in the C++ language. Their vocabulary will include elementary input, calculation and output instructions, the three loops, decisions, functions, arrays and strings.
16. **Method of Teaching**
Lectures and hands-on computer lab work.
17. **Assignments to Students**
Besides daily programming assignments, students will submit completed programs which will become part of their grade.
18. **Method of Evaluating**
Students will submit completed programs. Several tests will be given in class. There is a departmental final examination.
19. **Topical Course Outline**

Week	Chapter	Topics
1	0	Computer languages, hardware, software
1-3	1	Comments, directives, headers, declarations, assignments and print statements. The for loop
4	2	The if statement, relational operators, compound statements; type float, double and char

5	3	The while loop, cin
6	4	Constants, summation and nested loops
7	5	Functions
8	6	Do-while, switch, break and continue
9-10	7	Arrays
11	8	strings
12		Review

20. Bibliography

Deitel, H M. * Deital, P. J., C++ How to Program. (6th Edition). Upper Saddle River, New Jersey. Prentice Hall, 2007

Bronson, Gary J. and Walter, Kenneth. Program Development and Design Using C++.. Third Edition. Boston, Mass. Cengage Learning, 2005

Malik, D. S. C++ Programming: From Problem Analysis to Program Design (3rd. edition) Boston, Mass. Course Technology, 2006

Eileen Lichtenthal

Jan 2009

KINGSBOROUGH COMMUNITY COLLEGE
THE CITY UNIVERSITY OF NEW YORK

Proposed

COURSE SYLLABUS: CS 1200

1. DEPARTMENT, COURSE NUMBER, AND TITLE:

Department of Mathematics and Computer Science
CS 1200 - Introduction to Computing

2. DOES THIS COURSE MEET A GENERAL EDUCATION/CUNY CORE CATEGORY?

- Life and Physical Science
- Math and Quantitative Reasoning
- A. World Cultures and Global Issues
- B. U.S. Experience in its Diversity
- C. Creative Expression
- D. Individual and Society
- E. Scientific World

IF YES, COMPLETE AND SUBMIT WITH THIS PROPOSAL A CUNY COMMON CORE SUBMISSION FORM.

3. DESCRIBE HOW THIS COURSE TRANSFERS (REQUIRED FOR A.S. DEGREE COURSE). IF A.A.S. DEGREE COURSE AND DOES NOT TRANSFER, JUSTIFY ROLE OF COURSE, E.G. DESCRIBE OTHER LEARNING OBJECTIVES MET:

Course CS 1200 (Introduction to Computing) is equivalent to:

Brooklyn College: CISC 1110 - Introduction to Computing Using the C++ Programming Language 4 cr.

City College: CSC 10200 - Introduction to Computing - 3cr.

Lehman College: CMP 167 - Programming Methods - 3 cr.

NYC Technical College: CS101 - Computer Programming and Problem Solving - 3cr.

John Jay College: MAT 271 - Introduction to Computing and Programming - 3cr.

Medgar Evers College: CS 151 -Introduction to Computing - 3 cr.

College of Staten Island: CSC 126 Introduction to Computer Science - 4 cr.

4. BULLETIN DESCRIPTION OF COURSE:

Algorithms, programs, data representation, debugging and verification of programs. Numeric and non numeric programming applications include searching and sorting algorithms, function and procedures, and number theory problems.

5. CREDITS AND HOURS* (PLEASE CHECK ONE APPROPRIATE BOX BELOW BASED ON CREDITS):

1-credit:	<input type="checkbox"/> 1 hour lecture
	<input type="checkbox"/> 2 hours lab/field/gym

2-credits:	<input type="checkbox"/> 2 hours lecture
	<input type="checkbox"/> 1 hour lecture, 2 hours lab/field
	<input type="checkbox"/> 4 hours lab/field

<input checked="" type="checkbox"/> 2 hours lecture, 2 hours lab/field <input type="checkbox"/> 1 hour lecture, 4 hours lab/field <input type="checkbox"/> 6 hours lab/field
4-credits: <input type="checkbox"/> 4 hours lecture <input type="checkbox"/> 3 hours lecture, 2 hours lab/field <input type="checkbox"/> 2 hours lecture, 4 hours lab/field <input type="checkbox"/> 1 hour lecture, 6 hours lab/field <input type="checkbox"/> 8 hours lab/field
More than 4-credits: <input type="checkbox"/> Number of credits: ____ (explain mix lecture/lab below) ____ Lecture ____ Lab Explanation: _____

***Hours are hours per week in a typical 12-week semester**

6. **NUMBER OF EQUATED CREDITS IN ITEM #5:** _____

7. **COURSE PREREQUISITES AND COREQUISITES (IF NONE PLEASE INDICATE FOR EACH)**
 - A. **PREREQUISITE(S):** N/A
 - B. **COREQUISITE(S):** N/A
 - C. **PRE/COREQUISITE(S):** MAT 1400

8. **BRIEF RATIONALE TO JUSTIFY PROPOSED COURSE TO INCLUDE:**
 - A. **ENROLLMENT SUMMARY IF PREVIOUSLY OFFERED AS AN 82 (INCLUDE COMPLETE 4-DIGIT 82 COURSE NUMBER)**
 - B. **PROJECTED ENROLLMENT:** 112-140
 - C. **SUGGESTED CLASS LIMITS:** 28
 - D. **FREQUENCY COURSE IS LIKELY TO BE OFFERED:** Fall and Spring semesters.
 - E. **ROLE OF COURSE IN DEPARTMENT'S CURRICULUM AND COLLEGE'S MISSION:**

The language C++ is the most widely used programming language for the widest variety of applications and systems, and is known for its power and portability. It is an excellent language for a first course in programming methods, as all other languages are more accessible to the programmer who has a foundation in C++. It comes with many useful libraries, and is supported by sophisticated integrated environments. It is today's choice as the language most used for computer science instruction.

9. **LIST COURSE(S), IF ANY, TO BE WITHDRAWN WHEN COURSE IS ADOPTED (NOTE THIS IS NOT THE SAME AS DELETING A COURSE):** N/A

10. **IF COURSE IS AN INTERNSHIP, INDEPENDENT STUDY, OR THE LIKE, PROVIDE AN EXPLANATION AS TO HOW THE STUDENT WILL EARN THE CREDITS AWARDED. THE CREDITS AWARDED SHOULD BE CONSISTENT WITH STUDENT EFFORTS REQUIRED IN A TRADITIONAL CLASSROOM SETTING:** N/A

11. **PROPOSED TEXT BOOK(S) AND/OR OTHER REQUIRED INSTRUCTIONAL MATERIAL(S):** *Starting Out With C++ From Control Structures through Objects (9th ed.)* by Tony Gaddis

12. **REQUIRED COURSE FOR MAJOR OR AREA OF CONCENTRATION?** Yes

Computer Science, Mathematics, and Engineering.

IF OPEN ONLY TO SELECTED STUDENTS SPECIFY POPULATION:

This course is only open to students who have the pre/corequisites of MAT 1400 (Precalculus).

13. EXPLAIN WHAT STUDENTS WILL KNOW AND BE ABLE TO DO UPON COMPLETION OF COURSE:

Students will be able to write programs in the C++ language. Their programming skills will include familiarity with input, output, calculation, repetition using loops, decision constructs, function usage, arrays constructs and string usage.

14. METHODS OF TEACHING – Lectures and hands-on computer lab work.

15. ASSIGNMENTS TO STUDENTS:

Daily programming assignments in lab, programming projects of substance to be worked on and submitted at various times during the semester and homework assignments.

16. DESCRIBE METHOD OF EVALUATING LEARNING SPECIFIED IN #15:

Students will submit completed programs. Several tests will be given in class. There is a departmental final examination.

17. TOPICAL COURSE OUTLINE FOR THE 12 WEEK SEMESTER (WHICH SHOULD BE SPECIFIC REGARDING TOPICS COVERED, LEARNING ACTIVITIES, AND ASSIGNMENTS):

<u>Class meeting #</u>	<u>Lecture Topic(s)</u>	<u>Lab session</u>
1	Introduction to Computer Science, Computer Systems and their components, and Computer Programming.	30 minutes LAB programming practice with topic of the day
2	Overview of Input, Output, Processors, Primary Storage, Secondary Storage and the use of Programming Instructions.	30 minutes LAB programming practice with topic of the day
3	Introduction to the C++ Programming Language, general overview.	30 minutes LAB programming practice with topic of the day
4	The component parts of a computer program and the 3 basic types of instruction: simple statements executed in sequence, selection constructs , repetition constructs. (overview) PROGRAMMING PROJECT 1 assigned.	30 minutes LAB programming practice with topic of the day
5	PROGRAMMING PROJECT 1 due. Variables and the storing of information: declaring and initializing variables. Simple output of information.	30 minutes LAB programming practice with topic of the day
6	Variable types: int and double. Computations with int and double.	30 minutes LAB programming practice with topic of the day
7	Input: getting data from the user. Applying to previous lessons.	30 minutes LAB programming practice with topic of the day
8	Comments and documentation of code. The Science and “Art” of programming – when there is more than one “way”. PROGRAMMING PROJECT 2 assigned.	30 minutes LAB programming practice with topic of the day

9	PROGRAMMING PROJECT 2 due. Writing a basic calculator program for integers with modulus operator, then for double type.	30 minutes LAB programming practice with topic of the day
10	Introducing the selection construct: The IF statement. The Else component.	30 minutes LAB programming practice with topic of the day
11	Nested IF/ELSE constructs	30 minutes LAB programming practice with topic of the day
12	The char type for data introduced. Rationale for char arrays. Using char and char [] PROGRAMMING PROJECT 3 assigned.	30 minutes LAB programming practice with topic of the day
13	Introduction to the string type. String functions.	30 minutes LAB programming practice with topic of the day
14	Combining all programming knowledge covered so far. Introduction to the loop (while loop)	30 minutes LAB programming practice with topic of the day
15	Review for Exam 1	30 minutes LAB programming practice with topic of the day
16	PROGRAMMING PROJECT 3 due. EXAM 1	Lab exam 1 – 30minutes
17	Exploring usage of the WHILE loop.	30 minutes LAB programming practice with topic of the day
18	Introduction of to the DO/WHILE loop. Exploring usage of the DO/WHILE loop.	30 minutes LAB programming practice with topic of the day
19	Introduction of the FOR loop. Exploring usage of the FOR loop	30 minutes LAB programming practice with topic of the day
20	The science of picking the best type of loop construct to use in any given situation.	30 minutes LAB programming practice with topic of the day
21	Nested loops. PROGRAMMING PROJECT 4 assigned.	30 minutes LAB programming practice with topic of the day
22	Some practical applications for using nested loops.	30 minutes LAB programming practice with topic of the day
23	Introduction to the FLOW CHART. Why flow charts can be very helpful.	30 minutes LAB programming practice with topic of the day
24	Combining all the elements learned so far: variables, input, output, IF/ELSE, loops, etc.	30 minutes LAB programming practice with topic of the day
25	Construct a number-guessing game with clues for higher and lower and a guess count.	30 minutes LAB programming practice with topic of the day
26	Using loops for cumulative sums.	30 minutes LAB programming practice with topic of the day
27	Addressing the Fence-Post problem for loop element separators.	30 minutes LAB programming practice with topic of the day
28	Computing average, highest, and lowest from data entered. PROGRAMMING PROJECT 4 due.	30 minutes LAB programming practice with topic of the day
29	Introduction to the ARRAY ; the indexed list data structure.	30 minutes LAB programming practice with topic of the day
30	Using the Array in the grade average highest and lowest example.	30 minutes LAB programming practice with topic of the day
31	Review for Exam 2.	30 minutes LAB programming practice with topic of the day
32	Exam 2	Lab exam 2 – 30 minutes
33	Sorting the elements in an ARRAY: The Bubble Sort. PROGRAMMING PROJECT 5 assigned.	30 minutes LAB programming practice with topic of the day
34	More on Nested Loops and ARRAYS.	30 minutes LAB programming

		practice with topic of the day
35	Introduction to the aggregate data structure: the STRUCT	30 minutes LAB programming practice with topic of the day
36	Introduction the concepts of OBJECT ORIENTED PROGRAMMING and the aggregate data structure: CLASS	30 minutes LAB programming practice with topic of the day
37	Overview of topics that will be covered in greater detail in CS 13; better sorts than Bubble Sort, more detail on STRUCT/CLASS	30 minutes LAB programming practice with topic of the day
38	Investigation of the rationale for modular programming and structured programming as an intro to FUNCTIONS	30 minutes LAB programming practice with topic of the day
39	FUNCTIONS - distinction between built-in functions that use libraries (e.g. math, string) and user-defined functions.	30 minutes LAB programming practice with topic of the day
40	PROGRAMMING PROJECT 5 due. Parameter Passing to Functions. Values Returned from functions	30 minutes LAB programming practice with topic of the day
41	FUNCTION PROTOTYPES; their advantages and circumstances where they are indispensable	30 minutes LAB programming practice with topic of the day
42	Practice applying multiple functions. "Passing" Arrays to and from Functions. Wrap-up of PASS-BY-VALUE functions.	30 minutes LAB programming practice with topic of the day
43	Introduction to C++ pointers and the * and & (reference and dereference) operators.	30 minutes LAB programming practice with topic of the day
44	Introduction to PASS-BY-REFERENCE functions. PROGRAMMING PROJECT 6 assigned.	30 minutes LAB programming practice with topic of the day
45	Practice with SCOPE of variables. The :: operator.	30 minutes LAB programming practice with topic of the day
46	Combining all topics of the semester. Brief introduction to File I/O capabilities.	30 minutes LAB programming practice with topic of the day
47	Review for Final Exam part one	30 minutes LAB programming practice with topic of the day
48	Review for Final Exam part two. PROGRAMMING PROJECT 6 due.	30 minutes LAB programming practice with topic of the day

18. SELECTED BIBLIOGRAPHY AND SOURCE MATERIALS:

Deitel, H M. * Deital, P. J., C++ How to Program. (6th Edition). Upper Saddle River, New Jersey. Prentice Hall, 2007

Bronson, Gary J. and Walter, Kenneth. Program Development and Design Using C++.. Third Edition. Boston, Mass. Cengage Learning, 2005

Malik, D. S. C++ Programming: From Problem Analysis to Program Design (3rd. edition) Boston, Mass. Course Technology, 2006

Cormen T.H. and Leiserson C.E. , *Introduction to Algorithms*, 3rd Edition (The MIT Press), 2009

Bancila , *The Modern C++ Challenge: Become an expert programmer by solving real-world problems*, 2018

Gaddis, T., *Standard Version of Starting Out with C++*, 4th Edition, Scott Jones Publishers

Cormen T., Lieserson C., Rivest R., *Introduction to Algorithms*, second edition, MIT Press, Cambridge, Mass., 1993.

Horowitz E. and Sahni S., *Fundamentals of Computer Algorithms*, Computer Science Press, Rockville, Maryland, 1978.

Wirth N., *Algorithms + Data Structures = Programs*, Addison-Wesley, Reading, Mass., 1976.

Brassard G. and Bratly P., *Algorithmics: Theory and Practice*, Prentice Hall, Englewood Cliffs, New Jersey, 1988.

Revised/January 2019/Philip Listowsky