

KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York

CURRICULUM TRANSMITTAL COVER PAGE

Department: Department of Mathematics & Computer Science Date: 6/01/2026

Title Of Course/Degree/Concentration/Certificate: Advanced Programming Techniques (CS 13A0)

Change(s) Initiated: (Please check)

- | | |
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| ☐ Closing of Degree | ☐ Change in Degree or Certificate |
| ☐ Closing of Certificate | ☐ Change in Degree: Adding Concentration |
| ☐ New Certificate Proposal | ☐ Change in Degree: Deleting Concentration |
| ☐ New Degree Proposal | ☒ Change in Prerequisite, Corequisite, and/or Pre/Co-requisite |
| ☐ New Course | ☐ Change in Course Designation |
| ☐ New 82 Course (Pilot Course) | ☐ Change in Course Description |
| ☐ Deletion of Course(s) | ☒ Change in Course Title, Number, Credits and/or Hours |
| | ☐ Change in Academic Policy |
| | ☐ Pathways Submission: |
| | ☐ 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 |
| ☐ 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: 2026-07-23 Signature, Committee Chairperson: Paul R. Calhoun

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

Date Approved: _____ Signature, Department Chairperson: _____

Date Approved: _____ Signature, Department Chairperson: _____

I have reviewed the attached material/proposal

Signature, Department Chairperson: Rina Garmish



TO: Fall 2026 Curriculum Committee

FROM: Prof. Yarmish, Chair, Department of Mathematics & Computer Science

DATE: 6/1/2026

RE: Change in Number of Credits for CS 13A0 (Advanced Programming Techniques)

The Department of Mathematics & Computer Science is proposing a change in Number of Credits for CS 13A0 (Advanced Programming Techniques):

From:

4 Credit(s) Hours: 4 hrs.

To:

3 Credit(s) Hours: 4 hrs. (2 hrs. lecture, 2 hrs. 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.



TO: Fall 2026 Curriculum Committee

FROM: Prof. Yarmish, Chair, Department of Mathematics & Computer Science

DATE: 6/1/2026

RE: Change in Prerequisites for CS 13A0 (Advanced Programming Techniques)

The Department of Mathematics & Computer Science is proposing a change in Prerequisites for CS 13A0 (Advanced Programming Techniques):

From:

CS 1200 with grade of "C+" or higher

To:

CS 1200 with grade of "C" or higher

Rationale for Change: Decision of the Mathematics Department curriculum committee has determined that prerequisite of a grade of "C" or higher in CS 1200 is a sufficient prerequisite.

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Kingsborough Community College
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Modifications in Credits/Hours for an Existing Course Form

1. Course Number and Title:
CS 13A0 (Advanced Programming Techniques)

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

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

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:	☐ 1 hour lecture ☐ 2 hours lab/field/gym
2-credits:	☐ 2 hours lecture ☐ 1 hour lecture, 2 hours lab/field ☐ 4 hours lab/field
3-credits:	☐ 3 hours lecture ☒ 2 hours lecture, 2 hours lab/field ☐ 1 hour lecture, 4 hours lab/field ☐ 6 hours lab/field
4-credits:	☐ 4 hours lecture ☐ 3 hours lecture, 2 hours lab/field ☐ 2 hours lecture, 4 hours lab/field ☐ 1 hour lecture, 6 hours lab/field ☐ 8 hours lab/field
More than 4-credits: ☐ 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.

CS 13 ADVANCED PROGRAMMING TECHNIQUES

1. Department, Course Number, and Title:
Department of Mathematics & Computer Science, CS 13 - Advanced Programming Techniques
2. Does this course meet a General Education/CUNY Common Core Pathways Category?
Group E. (Scientific World)
3. Describe how this course transfers (required for A.S. Degree course):
Kingsborough CS 13 = Baruch BUS7500, BMCC CIS 1, BCC ELEC1000, BC CISC 3110, CC CSC 10300, CSI CSC 299, Guttman INFT 223, Hostos CIP 1111, Hunter FCSW 1000, JJC CSCI 272, LCC ELEC 1000, Lehman CMP 3000, Medgar Evars CS999, NYC Col.ofTech. ELEC 1000. QC CSCI499, QCC FCSW 1000, York CS999
4. College Catalog description of course:
A second course in programming designed to introduce advanced techniques, constructs and concepts. Program reliability, maintainability, and reusability are emphasized now (i.e. CS 12 focused on “getting the job done” - CS 13 begins the focus on “selecting *the best way* to get the job done”). Topics include: Module design and multi-file programs; File organizations, indexing and processing; Abstract data types and storage classes including usage of the struct and class implementations of ADT’s; Addresses, pointers, and dynamic storage allocation; Program testing and debugging; Recursion and function parameters.
5. Credits and Hours Based on *College Credits Assigned for Instructional Hours*:
4-CREDITS 4 hours lecture with lab programming time included
6. Number of Equated Credits in Item #5 _____ **N/A**
7. Course Prerequisites, Co requisites, Selected Populations: **Prerequisite: CS 12 with a minimum grade of C**
8. Brief rationale: **Enrollment: 28-30 students / semester. Class Limit: 30 students. Frequency 2x year
Role: Second core course in the major.**
9. Withdrawn course(s): **N/A**
10. Internship/Independent Study: **N/A**
11. Textbook: **Starting Out With C++ From Control Structures through Objects (9th ed.) by Tony Gaddis (ISBN-13: 978-0134498379 ISBN-10: 9780134498379)**
12. Approved Required Course.
13. What students will know and be able to do upon completion of course:
Enhance the student's programming sophistication with regards to program development and

debugging. Provide the student with a working knowledge of the relationship between the compiler, operating system, and underlying hardware. The student will be introduced to separate compilation, recursion, file processing, and abstract data types. Upon completion of the course the student will have a sophisticated knowledge of programming concepts and techniques and will be prepared for a rigorous course in Data Structures.

14. Methods of Teaching : Lecture, discussion and laboratory exercises designed specifically to prepare students to create complex meaningful programs. As the semester progresses, assignments will build on previous lessons.
15. Assignments to students: Class exams, final exam, lab assignments, programming projects and exercises.
16. Describe method of evaluating learning: **Course Grade = 35% Final Exam, 25% Exam1, 25% Exam2, 15% Programming Projects + Attendance + Participation .**
17. Topical Course Outline for the 12-week semester:

Week 1: Revisiting cin, cout, variable types/sizes, casting. Review of decision statements, loops, nested loops.

Week 2: Revisiting and enhancing operation understanding of function usage, function calls, function types, reference parameters, initializations, static/dynamic - local/global.

Week 3: Overloading. Arrays, multidimensional arrays, arrays as function parameters, sorting methods

Week 4: Pointers, pointer parameters, pointer arithmetic, dynamic storage allocation. Exam 1.

Week 5: Strings, string functions, string arrays, getline.

Week 6: Files - output/input, appending, as function parameters

Week 7: Structs, nested structs, structs as parameters, pointers to structs, member functions

Week 8: Classes, constructors, composite classes, operator overloading. Exam 2.

Week 9: Linked lists, stacks, queues, infix/prefix/postfix expressions

Week 10: Recursion explored. (usage in mergesort/quicksort, towers of Hanoi, & when NOT to use recursion)

Week 11: Templates: function templates, class templates, Namespaces.

Week 12: trees, binary trees, searches. Preview of CS 37, Data Structures.

18. Selected Bibliography and Source materials:

The C++ Programming Language (Bjarne Stroustrup)

Programming: Principles and Practice Using C++ (Bjarne Stroustrup, 2nd Edition - May 25, 2014)

A Tour of C++ (Bjarne Stroustrup)

Effective C++ (Scott Meyers, 3rd Edition - May 22, 2005)

C++ Primer (Stanley Lippman, Josée Lajoie, and Barbara E. Moo)



PROPOSED

Department Syllabus

Department:	Mathematics & Computer Science
Course Designation/Prefix:	CS
Course Number:	13A0
Course Title:	Advanced Programming Techniques
Course Description: (Description should include language similar to Course Learning Outcomes)	A second course in programming designed to introduce advanced techniques. Program reliability, maintainability, and reusability are emphasized. Topics include: Module design and multifile programs, file organizations, indexing and processing, abstract data types and storage classes, addresses, pointers, and dynamic storage allocation, program testing and debugging, and recursion and function parameters. Students who have completed CP 2200 will not receive credit for this course.
Prerequisite(s):	CS 1200 with a grade of “C” or higher.
Corequisite(s):	N/A
Pre-/Co-requisite(s):	N/A

2. Credits and Hours based on MSCHE Guidelines for *College Credits Assigned for Instructional Hours* -*Hours are based on hours per week in a typical 12-week semester (Please check **ONE** box based on credits):

1-credit: ☐ 1 hour lecture
☐ 2 hours lab/field/gym

2-credits: ☐ 2 hours lecture
☐ 1 hour lecture, 2 hours lab/field
☐ 4 hours lab/field

3-credits: ☐ 3 hours lecture
☒ 2 hours lecture, 2 hours lab/field
☐ 1 hour lecture, 4 hours lab/field
☐ 6 hours lab/field

4-credits: ☐ 4 hours lecture
☐ 3 hours lecture, 2 hours lab/field
☐ 2 hours lecture, 4 hours lab/field
☐ 1 hour lecture, 6 hours lab/field
☐ 8 hours lab/field

More than 4-credits: ☐ Number of credits: ____ (explain mix lecture/lab below)

____ Lecture ____ Lab

Explanation: _____

3. **Where** does this course fit? Select from the following:

☐ General Education/Pathways	Select ONE of the following: ☐ Life and Physical Science (LPS) ☐ Math and Quantitative Reasoning (MQR) ☐ World Cultures and Global Issues (Group A) ☐ U.S. Experience in its Diversity (Group B) ☐ Creative Expression (Group C) ☐ Individual and Society (Group D) ☒ Scientific World (Group E)
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4. Proposed textbook(s) and/or other required instructional material(s), including open educational resources (OER)– Please include any supplemental/recommended materials/texts to allow for **any** qualified instructor to teach the course:

- a. T. Gaddis, *Starting Out With C++: From Control Structures to Objects*, 10th edition. Boston: Pearson Education, Inc, 2022.
- b. “PowerPoint Slides for Starting Out with C++ from Control Structures to Objects, 10th edition”. Pearson, 2022.
- c. “Instructor's Lab Manual for Starting Out with C++ from Control Structures to Objects, 10th edition”. Pearson, 2021.
- d. C. Laplace and J. Mes, “Dev-C++”, v6, Embarcadero, 2021.

5. Topical Course Outline for the 12-week semester. This should be **specific** and **explicit** regarding the topics covered and should contain the detailed sample assignments/activities being used to measure the Course Learning Outcomes. **REMINDER** – be mindful to focus on the Course Learning Outcomes, Course Content, and Assessment.

Week	Book Sections	Lectures	Labs	Prog Asgn
1	Ch. 1-7	Review of Intro Computing	7.3	7.1
	8.1-2	Search Algorithms	8.2	
2	8.3-4	Sorting Algorithms	8.3	8.6
	9.1-4	Pointer Variables	9.2	
3	9.5-9	Pointer Arithmetic	9.3	9.2
	-	Lab Exercise	9.4.2	
4	-	TEST 1	-	
	10.1-6	Characters and C-Strings	10.5.2	
5	11.1-6	Structured Data	11.3	11.6
	11.7-12	Structures and Functions	11.5.2	
6	12.1-6	File Operations	12.2	12.6
	12.7-10	Binary and Random Access	12.3	
7	-	TEST 2	-	
	13.1-6	Introduction to Classes	13.1	
8	13.7-12	Constructors and Arrays	13.2	13.3
	13.13-16	UML and Object Design	*	
9	Ch. 14	More About Classes	*	14.4
	Ch. 15	Inheritance and Polymorphism	*	
10	-	TEST 3	-	
	Ch. 16	Templates	*	
11	Ch. 17	Linked Lists	*	16.10
	Ch. 18	Stacks and Queues	*	
12	Ch. 19	Recursion	*	
	Ch. 20	Trees and Review	-	

- Each row above represents 2 contacts hours (lecture & lab)
- (*) Indicates lab to read an object class from the book, and write a test driver for it.

6. Selected Bibliography and Source materials:

- a. B. Stroustrup, *The C++ Programming Language*. Upper Saddle River: Addison-Wesley, Cop, 2018.
- b. B. Stroustrup, *Programming : Principles And Practice Using C++*, 2nd ed. Upper Saddle River, NJ: Addison-Wesley, 2014.
- c. B. Stroustrup, *A Tour of C++*. Boston Addison-Wesley, 2018.
- d. S. Meyers, *Effective Modern C++ : 42 Specific Ways to Improve Your Use of C++11 and C++14*. Sebastopol: O'Reilly, 2017.
- e. S. B. Lippman, Josée Lajoie, and B. E. Moo, *C++ Primer*. Upper Saddle River, NJ: Addison-Wesley, 2013.
- f. T. Gaddis, J. Walters, and Godfrey Muganda, *Starting Out With C++: Early Objects*. Hoboken, NJ: Pearson Education, Inc, 2020.
- g. The ACM Two-Year College Education Committee & The Joint Task Force on Computing Curricula IEEE Computer Society Association for Computing Machinery, *Computing Curricula 2003: Guidelines for Associate-Degree Curricula in Computer Science*. USA: IEEE Computer Society, 2022.