Proposal to Revise the Associate in Science in Mathematics

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Facilitator: Pete Watkins / Amy A. Birge

Date: March 25, 2015

Effective Semester: Fall 2016

Description of the Proposed Revision

CSCI 111: Computer Science I with Java and CSCI 112: Computer Science II with Java have been recently revised. With these two course revisions, the Mathematics AS degree remains in compliance with the Statewide Program-to-Program Articulation Agreement in Mathematics. In addition, the two-course sequence of CSCI 111 and CSCI 112 includes all of the outcomes for the College's Technological Competency General Education requirement. The Technological Competency Checklist in Appendix A identifies how each of the technological competency outcomes are addressed within the CSCI 111-112 course sequence. Therefore, CIS 103: Applied Computer Technology no longer needs to be included in the Mathematics AS degree.

The Mathematics Department faculty are proposing for the Mathematics Associate in Science degree that CIS 103: Applied Computer Technology be deleted from the program requirements and that the minimum credits required to graduate be lowered from 63 to 60 accordingly.

Current Catalog Page

Mathematics

This program leads to an A.S. degree in Mathematics. The primary goal of the program is to prepare students for transfer to a baccalaureate program in mathematics. This curriculum provides freshman and sophomore level courses in both continuous and discrete mathematics.

Student Learning Outcomes:
Upon completion of this program graduates will be able to:

- Prove mathematical statements.
- Solve mathematical problems.
- Execute mathematical algorithms.

Program Entry Requirements:
This program is open to interested students who have demonstrated readiness for English 101 and Math 171, either by passing the appropriate placement test or by meeting the prerequisites for the course. Selected math and English courses are available for those not meeting entrance requirements. An educational plan leading to acceptance into the program will be developed for each applicant who does not meet the entrance requirements.

Program of Study and Graduation Requirements:
To qualify for the A.S. degree in Mathematics, students must complete a minimum of 63 credit hours as prescribed and attain a grade point average of 2.0 ("C" average).

Since science requirements vary at transfer institutions, students are advised to check requirements at transfer institutions before choosing science electives.

Current Mathematics Course Sequence

Course Number and Name	Prerequisites and Corequisites	Credits	Gen Ed Req.
First Semester			
MATH 171 - Calculus I	MATH 162	4	Mathematics
ENGL 101 – English Composition I		3	ENGL 101
MATH 163 - Discrete Math I	MATH 161	4	
Lab Science Elective		4	Natural Science
Second Semester			
MATH 172 - Calculus II	MATH 171	4	
MATH 263 - Discrete Math II	MATH 163	4	
ENGL 102 – The Research Paper	ENGL 101 with a grade of "C" or better	3	ENGL 102, Info Lit
Lab Science Elective	ENGL 101	4	Natural Science
Third Semester			
MATH 270 - Linear Algebra	MATH 171, MATH 172	4	
CSCI 111 – Computer Science I with Java	MATH 118 placement or higher; or MATH 161 or higher placement	4	
CIS 103 - Applied Computer Technology		3	Tech Comp
Lab Science Elective		4	
Fourth Semester			
MATH 271 - Calculus III	MATH 172, MATH 270	4	
CSCI 112 – Computer Science II with Java	CSCI 111 with a grdae of "C" or better	4	
Humanities Elective		3	Humanities
Social Science Elective		3	
MATH 272 - Differential Equations	MATH 172, MATH 270	4	
Minimum Credits Needed to Graduate: 63			

General Education Requirements
All General Education requirements are met through required courses (as indicated above) except for the **Writing Intensive** requirement, the **Interpretive Studies** requirement and the **American/Global Diversity** requirement. Therefore, in order to graduate, students in this program must choose one course that is designated **Writing Intensive**, one course that is designated Interpretive Studies and one course that is designated **American/Global Diversity**. The same course may be used to fulfill more than one of these requirements. View the courses

that fulfill all [degree requirements](#) and receive a more detailed explanation of the College's general education requirements to help in your selection.

For More Information Contact:
The Division of Math, Science and Health Careers, Room W2-7, 1700 Spring Garden Street, Philadelphia, PA 19130, Telephone (215) 751-8430; or the College Information Center (215) 751-8010.

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Program of Study and Graduation Requirements:
To qualify for the A.S. degree in Mathematics, students must complete a minimum of 60 credit hours as prescribed and attain a grade point average of 2.0 ("C" average).

Since science requirements vary at transfer institutions, students are advised to check requirements at transfer institutions before choosing science electives.

<mark>Proposed</mark> Mathematics Course Sequence

Course Number and Name	Prerequisites and Corequisites	Credits	Gen Ed Req.
First Semester			
MATH 171 - Calculus I	MATH 162	4	Mathematics
ENGL 101 – English Composition I		3	ENGL 101
MATH 163 - Discrete Math I	MATH 161	4	
Lab Science Elective		4	Natural Science
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CSCI 112 – Computer Science II with Java	CSCI 111 with a <mark>grade</mark> of "C" or better	4	Tech Comp
Social Science Elective		3	<mark>Social Science</mark>
MATH 272 - Differential Equations	MATH 172, MATH 270	4	
Minimum Credits Needed to Graduate: <mark>60</mark>			

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APPENDIX

<table>
<tr><td colspan="2" align="center">**Community College of Philadelphia**
Technological Competency Check List</td></tr>
<tr><td colspan="2">This check list can be used to show how the goals and objectives for Technological Competency are included within a course or curricula. Curricula that include a single course already satisfying the Technological Competency requirement need only cite the course.</td></tr>
</table>

<table>
<tr><td>**Course or Curricula**</td><td>CSCI 111, 112 course sequence
Computer Science A.S. Degree</td></tr>
<tr><td>**Evaluated by**</td><td>C. Herbert</td></tr>
<tr><td>**Date**</td><td>October 1, 2012</td></tr>
</table>

<table>
<tr><td align="center">**Technological Competency Goals**</td><td align="center">**Location within course or curricula being evaluated**</td></tr>
<tr><td>**Goal I:** Graduates will be able to use word processing software to produce academic and professional documents, individually and working in collaboration with others.</td><td>CSCI 111: Learning Outcome 7: Apply word processing and social networking software to produce and post academic and professional documents, individually and working in collaboration with others.</td></tr>
<tr><td colspan="2">**Objectives**
They will be able to:</td></tr>
<tr><td>1. define key terms related to word processing.</td><td>CSCI 111: Learning Outcome 7</td></tr>
<tr><td>2. create, edit, and print documents with a word processor using word processing software, demonstrating the ability to manipulate character, paragraph and document formats; check a document's spelling and grammar; use the word processing software's thesaurus; add document headers and footers; and add bulleted and numbered lists to the document.</td><td>CSCI 111: Learning Outcome 7</td></tr>
<tr><td>3. create links to objects from within a document and embed objects in documents.</td><td>CSCI 111: Learning Outcome 7</td></tr>
<tr><td>4. create and manipulate tables of information in a document.</td><td>CSCI 111: Learning Outcome 7</td></tr>
<tr><td>5. use word processing software to add reference items to an existing document.</td><td>CSCI 111: Learning Outcome 7</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>**Goal II:** Graduates will be able to use electronic spreadsheets to organize, analyze and present data.</td><td>CSCI 112: Learning Outcome 5: Use electronic spreadsheets to organize, analyze, and present data related to the temporal and spatial complexity</td></tr>
</table>

	of algorithms.
Objectives They will be able to:	
1. define key terms related to electronic spreadsheets.	CSCI 112: Learning Outcome 5
2. sort and enumerate electronic spreadsheet data.	CSCI 112: Learning Outcome 5
3. use spreadsheet functions to perform simple numerical analysis of data, including finding the cardinality (count), minimum, maximum, sum, mean (average), and median of a data set, or a subset of the data that meets specified criteria.	CSCI 112: Learning Outcome 5
4. organize and format tables of spreadsheet information for both on-screen and printed presentations.	CSCI 112: Learning Outcome 5
5. create and format pie charts, histograms, line graphs, and X-Y scatter diagrams of spreadsheet information for both on-screen and printed presentations and describe the appropriate uses of each.	CSCI 112: Learning Outcome 5
6. embed electronic spreadsheet tables and graphs in other documents, and create links to electronic spreadsheets tables and graphs from other documents.	CSCI 112: Learning Outcome 5
7. demonstrate how to use Boolean logic and comparison operators in creating conditional statements using electronic spreadsheets.	CSCI 112: Learning Outcome 5
Goal III: Graduates will be able to use library and database information systems.	CSCI 112: Learning Outcome 7: Demonstrate an understanding of library and database information systems and create software that interacts with a database.
Objectives They will be able to:	
1. use a library's online card catalog to find items in the collection that meet specified criteria.	CSCI 112: Learning Outcome 7
2. describe the different types of document database systems found in the library and the appropriate use of each.	CSCI 112: Learning Outcome 7
3. use a full-text database in the Library to retrieve articles on a specified subject.	CSCI 112: Learning Outcome 7
4. use a document summary database to retrieve information about articles on a specified subject.	CSCI 112: Learning Outcome 7
5. describe how to locate sources of information	CSCI 112: Learning Outcome 7

using a Web search engine, and to identify the source based on its URL *(Uniform Resource Locator)*.	
6. describe how to use word processing software to properly cite books, articles from periodicals such as professional journals, and Web pages when using information from them in academic and professional papers.	CSCI 112: Learning Outcome 7
7. describe how to use Boolean logic and comparison operators while searching for items in library information systems	CSCI 112: Learning Outcome 7
Goal IV: Graduates will be able to use collaboration and social networking software for academic, professional, and personal use. They will be able to create Web pages from application software documents and share those documents with others by posting them on the Web.	CSCI 111: Learning Outcome 7: Apply word processing and social networking software to produce and post academic and professional documents, individually and working in collaboration with others.
Objectives They will be able to:	
1. define the terms electronic social networking (or digital social networking), blog, and wiki.	CSCI 111: Learning Outcome 7
2. create a personal Web-based blog, add entries to the blog, and leave comments on other people's blogs.	CSCI 111: Learning Outcome 7
3. collaborate with others in an electronic environment (e.g. use wiki software).	CSCI 111: Learning Outcome 7
4. list and describe several commonly used social networking sites.	CSCI 111: Learning Outcome 7
5. create a Web page or set of Web pages from commonly used office applications software.	CSCI 111: Learning Outcome 7
Goal V: Graduates will be able to connect personal computers to related equipment, such as printers, cell phones, PDAs (Personal Digital Assistants) and digital cameras, and to a wireless computer network in a secure manner.	CSCI 111: Learning Outcome 10: Demonstrate an understanding of computer data communications and the ability to connect computers to each other and peripheral equipment.
Objectives They will be able to:	
1. define key terms related to networking and mobile computing.	CSCI 111: Learning Outcome 10
2. describe how to connect a computer to a publicly accessible LAN (Local Area Network) using a wireless connection.	CSCI 111: Learning Outcome 10
3. describe how to connect a commonly used	CSCI 111: Learning Outcome 10

device, such as a printer, to a personal computer.	
4. describe how to connect a hand-held device, such as a cell phone, iPod, or PDA, to a personal computer and move data from one to other.	CSCI 111: Learning Outcome 10
5. describe how to determine if a wireless network is secure, and to secure a wireless home network from outside intrusion, and the importance of such protection.	CSCI 111: Learning Outcome 10
Goal VI: Graduates will demonstrate an understanding of common ethical issues related to the use of information technology systems and the handling of data, including privacy and security issues.	CSCI 111: Learning Outcome 9: Demonstrate an understanding of common ethical issues related to the use of information technology systems and the handling of data, including privacy and security issues.
Objectives They will be able to:	
1. describe the College's policies for the use of academic computing networks and comment on the rationale and importance of such policies.	CSCI 111: Learning Outcome 9
2. describe some of the ethical, legal and security issues related to handling private, personal and proprietary data.	CSCI 111: Learning Outcome 9
3. describe the ethical responsibilities of systems administrators and individual users in securing computer systems and backing up important data.	CSCI 111: Learning Outcome 9
4. briefly describe at least one example of legislation related to information technology ethics, such as a the Family Educational Rights and Privacy Act (FERPA) regulations, and why they are important.	CSCI 111: Learning Outcome 9
5. describe the ethical, security, and privacy issues involved in posting information about yourself and others on social networking sites, including blogs.	CSCI 111: Learning Outcome 9