University of Maryland University College

Baccalaureate Degree Program in Computer Science
Department of Computer Information Systems and Technology

PROGRAM ASSESSMENT PLAN
Program Outcomes and Learning Assessment Criteria

Summer 2007

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PROGRAM OVERVIEW

The computer science major is designed for students who have a good background in mathematics and an interest in the theory, practice, art, and science of computer programming. This major provides graduates with an educational foundation appropriate for careers in computer software or computer system design, including careers as software engineers, application software designers, system programmers, and system engineers.

PROGRAM OF STUDY

The program of study for the Baccalaureate Degree Program in Computer Science is as follows:

GENERAL EDUCATION REQUIREMENTS

Communication	12 credit hours
Arts and Humanities	6 credit hours
Behavioral and Social Sciences	6 credit hours
Biological and Physical Sciences	7 credit hours
Mathematics	3 credit hours
Interdisciplinary or Emerging Issues	7 credit hours

CROSS-CURRICULAR PERSPECTIVE REQUIREMENTS

Historical Perspective	3 credit hours
International Perspective	3 credit hours
Civic Responsibility Perspective	3 credit hours

REQUIRED COURSES

CMSC 101	Introductory Computer Science	3 credit hours
CMSC 130	Computer Science I	3 credit hours
CMSC 150	Introduction to Discrete Structures	3 credit hours
CMSC 230	Computer Science II	3 credit hours
MATH 140	Calculus I	4 credit hours
MATH 141	Calculus II	4 credit hours
COMM 393/393X	Technical Writing or other course to fulfill the communication upper-level intensive writing requirement	3 credit hours
CMSC 311	Computer Organization	3 credit hours
CMSC 330	Advanced Programming Language	3 credit hours
CMSC 335	Object-Oriented and Concurrent Programming	3 credit hours
Other	400-level CMSC courses except CMSC 486	9 credit hours

PROGRAM OF STUDY (continued)

MINOR AND ELECTIVE COURSES 38 credit hours

Minor and/or elective courses are to be taken in the last 60 hours along with required major courses. Refer to the current UMUC School of Undergraduate Studies Catalog for the minor and/or elective course requirements.

DEVELOPMENT OF PROGRAM OUTCOMES

The table below identifies the curricular influences that support the program outcomes specific to the Baccalaureate Degree Program in Computer Science.

SOURCES/RESOURCES PROVIDING CURRICULAR FOUNDATION FOR PROGRAM OUTCOMES Baccalaureate Degree Program in Computer Science		
SOURCE	**DESCRIPTION**	**WEB ADDRESS OR DOCUMENT NAME (if applicable)**
Core Learning Areas of the UMUC School of Undergraduate Studies	All UMUC degree programs are required to imbed identified Core Learning Areas into the program of study. The Core Learning Areas are: • Written Communication (COMM) • Technology Fluency (TECH) • Information Literacy (INFO) • Quantitative Literacy (QUAN) • Critical Thinking (THIN) • Scientific Literacy (SCIE) The expanded definition for each Core Learning Area was considered in creating the respective program outcome.	UMUC Institutional Plan for the Assessment of Student Learning
External Reviewer	An external reviewer was charged to provide consultation in the review of degree coursework.	CSCI Academic Program Review (2006)
Working Groups	Faculty members, including UMUC-Asia and UMUC-Europe administrators and faculty, provide input to changes in the major.	
Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET)	ABET is used as an external standard to guide the program and the direct and indirect measures used to assess program outcomes.	http://www.abet.org/

PROGRAM OUTCOMES

The program outcomes specific to the Baccalaureate Degree Program in Computer Science are delineated below. The program outcomes describe the expectations for all graduates of the Baccalaureate Degree Program in Computer Science.

CORE LEARNING AREA	PROGRAM OUTCOMES Baccalaureate Degree Program in Computer Science
	Upon completion of the Baccalaureate Degree Program in Computer Science, graduates will be able to:
COMM	Create written communication that is appropriate for the purpose and meets standards of style and grammatical correctness.+
	Write clear documentation supporting computer programs and systems.*
TECH	Evaluate technological concepts related to computers and components of information systems appropriately.+
	Design efficient algorithms and data structures in writing computer programs.*
INFO	Address recognized research needs by retrieving, evaluating, and using information appropriately.+
	Use information resources to assist with computer science projects or research.*
QUAN	Demonstrate the application of mathematical and numerical reasoning skills.+
	Apply the mathematical foundations of computer science in analyses of models of computation.*
THIN	Utilize effective computer organization and system architecture to enhance performance.*
SCIE	Identify key concepts and principles of natural sciences.+
	Apply efficient and appropriate test processes to ensure programs are functioning properly and within specification.*

+ Denotes a program outcome specific to core skills, knowledge, and values gained from completion of the general education requirements. This program outcome is common across all UMUC baccalaureate degree programs.

* Denotes a program outcome specific to core skills, knowledge, and values gained from completion of requirements in the baccalaureate degree program. This program outcome is unique to each UMUC baccalaureate degree program.

ALIGNMENT OF PROGRAM OUTCOMES WITH LEARNING OBJECTIVES AND ASSESSMENT METHODS

The following grid aligns the program outcomes of the Baccalaureate Degree Program in Computer Science with: 1) learning objectives from the designated program coursework and 2) specific methods used to assess student learning within the degree program.

CURRICULAR ALIGNMENT Baccalaureate Degree Program in Computer Science			
CORE LEARNING AREA	**PROGRAM OUTCOMES**	**LEARNING OBJECTIVE(S) AND CORRELATING COURSEWORK**	**METHOD(S) OF ASSESSMENT**
COMM	Create written communication appropriate for the purpose and which meets standards of style and grammatical correctness.+	Plan and write a research-based essay that makes effective use of resources found in databases available from UMUC's Office of Information and Library Services as well as resources located through Web search engines. (WRTG 101)	Research Paper
		Research, compile, and document relevant, credible information and use it to support ideas presented in your writing. (WRTG 393)	Research Paper
		Collect, select, analyze, interpret, and organize data, and use it appropriately in business communications, including a long formal report. (WRTG 394)	Research Paper
		Conduct a systematic audience analysis and apply it to a report, essay, or research paper. (WRTG 391)	Research Paper
	Write clear documentation supporting computer programs and systems.*	Write clear program documentation. (CMSC 130)	Other: Programming Project

CURRICULAR ALIGNMENT Baccalaureate Degree Program in Computer Science			
CORE LEARNING AREA	**PROGRAM OUTCOMES**	**LEARNING OBJECTIVE(S) AND CORRELATING COURSEWORK**	**METHOD(S) OF ASSESSMENT**
TECH	Evaluate technological concepts related to computers and components of information systems.+	Analyze issues faced by information system professionals, including security, ethical, and privacy problems. (IFSM 201)	Exam (Course/Chapter)
	Design efficient algorithms and data structures in writing computer programs.*	Write moderate-sized Java programs consisting of multiple classes and subclasses. (CMSC 230)	Other: Programming Project
INFO	Address recognized research needs by retrieving, evaluating, and using information appropriately.+	Select relevant print and electronic sources to answer research questions. (LIBS 150)	Exam (Course/Chapter)
	Use information resources to assist with computer science projects or research.*	Write a technical research paper on current trends or topics in Computer Architecture using well-qualified and relevant resources. (CMSC 311)	Research Paper
QUAN	Apply mathematical and numerical reasoning skills.+	Solve linear, quadratic, higher-order polynomial, fractional, radical, exponential, logarithmic, and absolute value equations and inequalities. (MATH 107) Develop problem solving skills. (MATH 105 or MATH 106)	Exam (Course/Chapter) Exam (Course/Chapter)
	Apply the mathematical foundations of computer science in analyses of models of computation.*	Analyze algorithms to estimate their efficiency. (CMSC 150)	Exam (Course/Chapter)
THIN	Utilize effective computer organization and system architecture to enhance performance.*	Determine how advanced concepts, like pipelining, improve performance. (CMSC 311)	Exam (Course/ Chapter)

CURRICULAR ALIGNMENT Baccalaureate Degree Program in Computer Science			
CORE LEARNING AREA	**PROGRAM OUTCOMES**	**LEARNING OBJECTIVE(S) AND CORRELATING COURSEWORK**	**METHOD(S) OF ASSESSMENT**
SCIE	Identify key concepts and principles of natural sciences.+	Recognize the differences and the interrelationships among physics, chemistry, the earth sciences, and astronomy. (NSCI 100) Explain the significance of DNA in determining the composition, characteristics, reproduction, and behavior of an organism. (BIOL 101)	Exam (Course/Chapter) Exam (Course/Chapter)
	Apply efficient and appropriate test processes to ensure programs are functioning properly and within specification.*	Document programs effectively and create and use test data. (CMSC 101)	Other: Programming Project

+ Denotes a program outcome specific to core skills, knowledge, and values gained from completion of the general education requirements. This program outcome is common across all UMUC baccalaureate degree programs.

* Denotes a program outcome specific to core skills, knowledge, and values gained from completion of requirements in the baccalaureate degree program. This program outcome is unique to each UMUC baccalaureate degree program.