

Computer Science
NORTHERN ARIZONA UNIVERSITY COLLEGE OF ENGINEERING AND NATURAL SCIENCES
2008-2009 Program of Study for the
Bachelor of Science in Applied Computer Science (BSACS)

This is a suggested program of study. Courses can be taken in any sequence, if prerequisites and corequisites are satisfied. You must earn a C or better in each course listed as a prerequisite for any CS/EE/EGR/ME/CENE course you take. See the catalog description of each course for prerequisites and corequisites. Please be aware that some courses are not offered every semester.

FALL		FRESHMAN YEAR		SPRING	
CS 110	Intro to Object-Oriented Programming	3	_____	CS 126	Intro to Computer Science
MAT 125 or MAT 136	Pre-Calculus or Calculus	4	_____	CS 126R	Intro to CS - Recitation
_____	Language I	4	_____	_____	Language II
_____	General Elective	3	_____	ENG 105	Critical Reading/Writing
_____	First Year Experience	1	_____	_____	Science Elective I (with Lab)
		<u>15</u>			
				<u>16</u>	

FALL		SOPHOMORE YEAR		SPRING	
CS 136	Software Techniques	3	_____	_____	Language IV
_____	Tech Elective	3	_____	CS 248	Foundations of Comp. Sci.
_____	Science Elective	3	_____	_____	International Awareness elective
_____	Language III	4	_____	_____	Science Elective
MAT 226	Discrete Math	3	_____	CS 249	Data Structures
		<u>16</u>			
				<u>16</u>	

FALL		JUNIOR YEAR		SPRING	
CS 200	Computer Organization	3	_____	_____	CS elective
CS 386	Software Engineering	3	_____	ENG 302W	Technical Writing
_____	CS elective	3	_____	CENE225	Engineering Analysis OR
_____	International Awareness elective	3	_____	STA 270	Applied Statistics OR
_____	Tech elective	3	_____	STA 275	Statistical Analysis
CS 301	Social & Ethical Issues in CS	1	_____	_____	CS elective
		<u>16</u>		CS 480	Operating Systems
				<u>15</u>	

FALL		SENIOR YEAR		SPRING	
CS 345	Databases	3	_____	CS 476C	Applied Capstone Design
_____	CS elective	3	_____	_____	CS elective
_____	CS elective	3	_____	_____	Tech elective
_____	Tech elective	3	_____	_____	Liberal Studies Elective
_____	International Awareness elective	3	_____	_____	General Elective
		<u>15</u>			
				<u>14</u>	

LIBERAL STUDIES REQUIREMENTS (NAU and Departmental)

1. 18 total elective credits are required in the NAU liberal studies categories of Social and Political Worlds, Aesthetic and Humanistic Inquiry, and Cultural Understanding; 6 hours must be completed in each of the three categories. (CS prefix courses are not permitted). In addition, the BSACS requirements require a total of 16-credits of foreign (non-English) language; six of these hours satisfy the Cultural Understanding category.
2. 4 hours of NAU lab science and 6 hours of NAU science/ applied science as specified on the next page.
3. ENG 105, MAT 125/136 (Foundations), ENG 302W (Jr. writing requirement), CS476C (Sr. capstone)

Social and Political Worlds 6 units required	Aesthetic & Humanistic Inquiry 6 units required	Cultural Understanding 16-credits of foreign language required
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Other requirements: NAU has both a three credit U.S. ethnic and a three credit global diversity requirement. These credits should be selected from the approved list, which may also satisfy liberal studies or major requirements.

SCIENCE ELECTIVES

Based on NAU liberal studies requirements, a student must complete 4 hours of Lab Science and 6 hours of Science and Applied Science credits. Typical Lab Science courses are those courses that have a lab associated with them for a total of at least four credits, e.g., PHY 111/112, CHM 151/152 and their labs. Science and Applied Science courses can be any course approved in this category by the university; a broad array of courses are available. See <http://www4.nau.edu/aio/Articulation/LScourcelist.htm> for the full list of approved Liberal Studies courses.

INTERNATIONAL COMPETENCE

Internationalization is a central emphasis of the B.S. program in Applied Computer Science (BSACS) program. Students seeking the degree must complete:

- Four semesters (16 hours) of foreign (non-english) language study; at least two semesters of this must be in the same language.
- Nine (9) units of coursework, chosen from the following set of courses: POS120, ANT102, ANT103, REL150, GGR240, GGR241, GGR370W, POS360, POS380, POS480, POS482, ECO483, ECO486, HUM261, HUM281, HUM382, CENS396. Other internationally-themed courses may be substituted with the department chair's approval.

COMPUTER SCIENCE ELECTIVES

The B.S. program in Applied Computer Science (BSACS) requires at least 18 hours of computer science electives and 15 hours of Tech electives selected in consultation with the student's academic advisor. Any CS elective may be substituted for a Tech elective. Courses that satisfy the computer science elective requirement are listed below. Note that some of the courses come from departments other than computer science. Advance written permission from the department chair is needed in order to have courses not shown below counted as CS electives.

Computer science electives currently include the following (all carry three hours credit):

<u>Course</u>	<u>Course Title</u>
CS 412	Enterprise Web Computing
CS 413	Virtual Worlds
CS 430	Computer Graphics
CS 445	Data Mining
CS 460	Computer Networks
CS 465	Distributed Systems
CS 470	Introduction to Intelligent Systems
CS 477	Advanced User Interfaces
CS 481	Compilers
CS 485*	Undergraduate Research
CS 497*	Independent Study
CS 499**	Topics in Computer Science
EE 414	Computer Architecture
EE 442	Image Processing
EE 448	Digital Signal Processing (Prerequisite EE 348 can be taken as an Tech elective.)

* NOTE: No more than six hours of Undergraduate Research and Independent Study may be submitted as computer science electives.

** NOTE: CS499 is used generically to test out new courses before adding them permanently to our offering. CS499 may be repeated for credit, so long as the course subtitle (topic) is different.

TECH ELECTIVES

Computer science majors are required to complete 15 hours of Tech electives, selected in consultation with the student's academic advisor. These can be selected from courses with the prefixes EE, MAT, PHY, CHM, GGR and BIO as well as from CS general electives at the 200 level or above. Courses with other prefixes can be selected with permission of your advisor. Computer scientists work in collaboration with professionals in a wide variety of disciplines. The Tech elective requirement is meant to encourage computer science students to minor in an additional field of interest or to pick up additional expertise in one or more additional fields of interest.

General Electives

Additional coursework is required, if, after you have met the previously described requirements, you have not yet completed a total of 120 units of credit. You may take these remaining courses from any academic areas, using these courses to pursue your specific interests and goals. We encourage you to consult with your advisor to select the courses that will be most advantageous to you.

CERTIFICATE in International Engineering and Science

The Certificate in International Engineering and Natural Science is a perfect complement to the BSACS degree program, as students can leverage the language training required in the BSACS program towards the language competency required for the certificate. The certificate is an addendum to undergraduate degrees (issued as a separate document) awarded to students who incorporate international training and experience into their undergraduate studies.

Courses already required in the BSACS in CS program applicable to the certificate:

Two years (4 courses) of foreign language training. Students must take one more language course at 300+ level (or demonstrate competency) for the certificate.

Study abroad: The certificate requires a study or internship abroad. Students can leverage this in two ways: first, language training received under the BSACS program requirements can prepare them for this experience abroad; and second, language skills gained abroad can be transformed into NAU language credit, which can be applied towards the BSACS degree. For instance, a student might take two language courses at NAU, then go abroad for advanced language study. Upon return, a competency test will result in up to 12 credits of NAU foreign language coursework credit being awarded, fully satisfying the BSACS degree requirement.

Other requirements of the certificate program: 9 elective credits (at least three 300+) are required, chosen from a list of appropriate liberal studies courses. Students simply select from these courses to fill liberal studies credits already required by NAU.