ABET
Self-Study Report

for the

B.S. in Computer Science

at

Lamar University

Beaumont, Texas

June 30, 2013

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BACKGROUND INFORMATION

A. Contact Information

Dr. Stefan Andrei, Chair
Lamar University
Department of Computer Science
211 Red Bird Lane
P.O. Box 10056
Beaumont, TX 77710

Telephone number: (409) 880-8748 (Direct)
(409) 880-8775 (Administrative Associate Senior)
Fax number: (409) 880-2364
Email address: Stefan.Andrei@lamar.edu

Department website: http://cs.lamar.edu

B. Program History

Computer Science was established as a Division in the College of Engineering in 1976. In 1979 it became the Department of Computer Science. Dr. Bill Nylin served as the first Chair of from 1976 to 1979. Dr. Bobby Waldron served as Chair from 1979 to 1988. Dr. David Reed served as interim Chair from 1988 to 1989. Dr. Ronald King served as Chair from 1989 to 1993. Dr. Lawrence Osborne served as Chair from 1993 to 2012. The current Chair is Dr. Stefan Andrei.

Major changes in the Department include:

1. First ABET accreditation in 2001.
2. Moved from College of Engineering to College of Arts and Sciences in 2004.
3. Employment of two permanent full-time non tenure-track faculty members in 2007.
4. Employment of full-time system administrator in 2008.
5. Development of online classes beginning in 2009.
6. Offered Bioinformatics concentration starting in 2010.
7. Adopted 4 courses in game development in 2013 in preparation for adding a Game Development concentration in 2014.

The last ABET review was in 2007.

C. Options

Students have an option to select two computer science electives and one free elective.

D. Organizational Structure

At the department level, the instructor of record has authority over each of his/her courses during the semester taught. For each course there is a course coordinator who assures the correct material is covered. The Undergraduate Curriculum Committee oversees the undergraduate curriculum as a whole. Changes to the curriculum or other curriculum issues are voted on by the Undergraduate Curriculum Committee before going to the faculty for a vote. The Department Chair is the chief administrator in the Department and reports to the Dean of the College of Arts and Sciences. The structure from department to upper administration is shown in Figure 1-1.

E. Program Delivery Modes

Courses in the program are taught during both the day and evening. The delivery mode is traditional lecture/laboratory. In addition, the Department offers a sufficient number of online courses to enable a student to graduate with a degree from the program by taking program courses entirely online.

F. Program Locations

All computer science courses are offered on the main campus of Lamar University.

G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them

As a result of the most recent ABET visit in 2007, the following changes were made (text summarized from Interim Report for 2007-2008 Accreditation Cycle, submitted June 30, 2009).

1. The Visiting Team from ABET that came in September 2007 found that we had a weakness in our Assessment criteria. Our response was to send every faculty member to a ABET workshop on a program assessment. Since fall 2007, all of our faculty have attended at least an ABET workshop on program outcome assessment. Moreover, the College has continued to send faculty members on a rotating, continuous basis so that the Department is always aware of the latest ABET requirements.

2. COSC 3304, formerly known as "Object-Oriented Design and Interfaces", was renamed "Analysis and Design of Algorithms." The motivation was the poor performance of our students in the design projects in COSC 4172 (Senior Seminar) and the poor results of our direct measures concerning algorithm design as evaluated in COSC 2336 (Data Structures). This change went into effect in spring 2009.

3. We noticed that many students who succeeded in COSC 1336 (Fundamentals of Computing I) and COSC 1337 (Fundamentals of Computing II) changed their major from computer science to another discipline. The Curriculum Committee recommended to the entire faculty that we develop a Bioinformatics specialization to start in spring 2010. This

involved the creation of two new courses in Bioinformatics, one at the junior level (CPSC 3316, Introduction to Bioinformatics), and one at the senior level (CPSC 4316, Data Mining & Bioinformatics). The entire faculty approved the bioinformatics concentration in February 2009 after considering the results of the analysis of collected data by the Assessment Committee and Curriculum Committee recommendations in 2007-2008. The new concentration was approved by the University Curriculum Committee. The first course was offered in spring 2010. However, to date, no students have graduated with the Bioinformatics concentration.

4. Another weakness observed by the previous ABET visit was the insufficient coverage of the computing ethics and the global impact of computer science in the society. In response, we assign certain topics from ethics to other courses. Table 1-1 describes the details of mapping the topics to existing courses.

Table 1-1. Location of Modules in Curriculum for Ethics and Social Impact.

Modules/Course Numbers	Computer Networks (CPSC 3320)	Computer Ethics and Law (COSC 3325)	Database Design (CPSC 4340)	Software Engineering (CPSC 4360)
Privacy and Personal Information		X	X	
Encryption and Interception of Communications	X			
Reliability and Safety: Failure, Risk, and Progress		X		
Freedom of Speech on the Internet		X		
Intellectual Property				X
Computer Crime	X	X	X	X
Computers and Work		X		
Computer and Community: Access issues, Who benefits and who loses?		X		
Professional Ethics and Responsibilities		X		X

The assessment team will continue to monitor and report on the indirect and direct measures of Student Outcomes 4 and 5 to ensure that the additional modules in these courses yield improvement.

H. Joint Accreditation

The program is jointly accredited by ABET and by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS). SACS accredits Lamar University to award degrees including Bachelor's degrees. The program's last ABET accreditation was in 2007. The University's last SACS accreditation was in 2010.

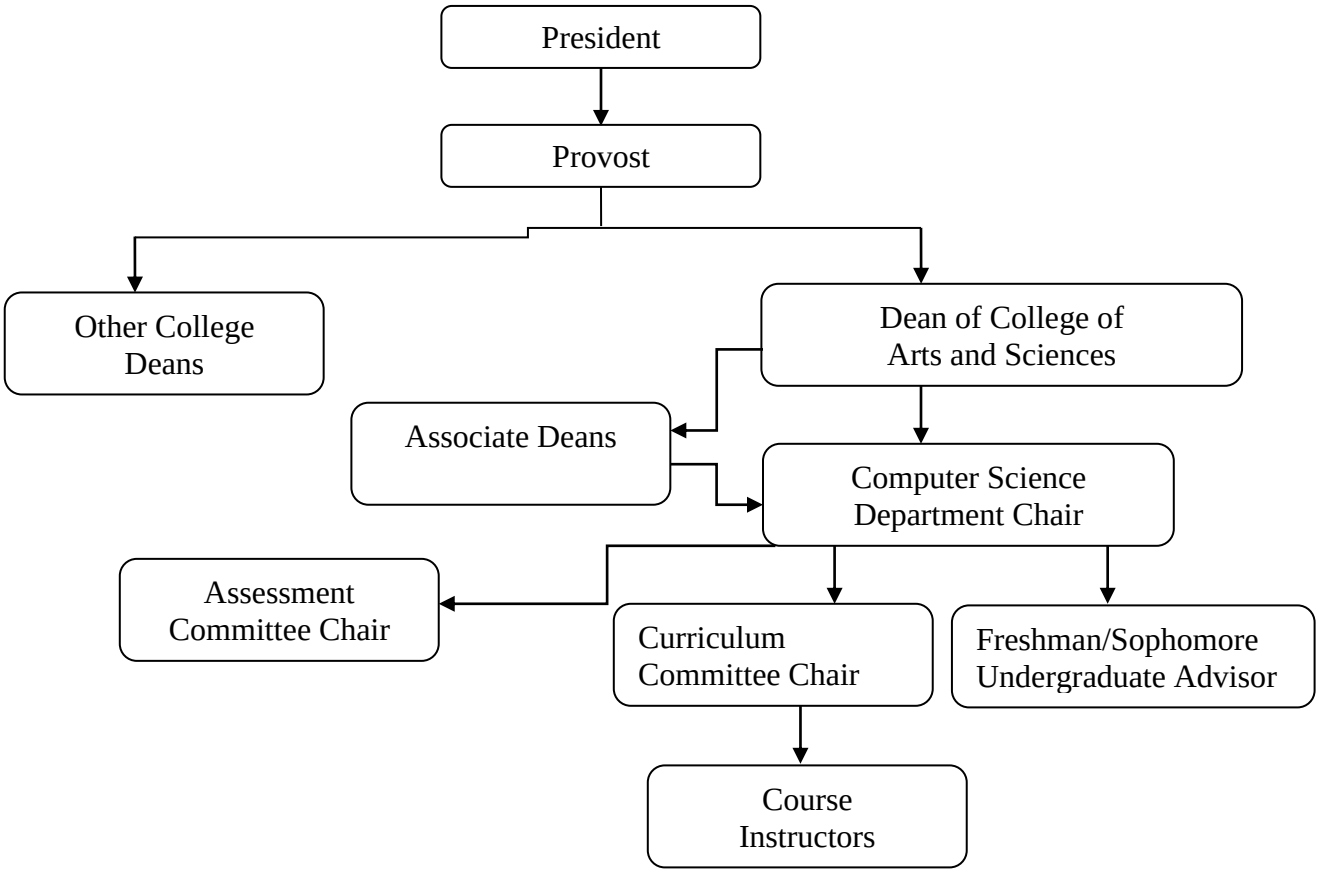


Figure 1-1. The administrative structure of the Department of Computer Science at Lamar University

GENERAL CRITERIA

CRITERION 1. STUDENTS

A. Student Admissions

All interested students must apply to Lamar University and satisfy the University admission requirements. Students can indicate at the time of the initial application their interest in the Computer Science program, or they may declare their interest at any time thereafter. Students who are already admitted and wish to declare Computer Science as their major must first go to the University Records Office and fill out a "Declaration/Change of Major" form. Once this form is completed, or if the student indicated his/her desire to be in the Computer Science program upon admission, the student is automatically considered to be a Computer Science student. There is no other specific procedure for admission into the undergraduate computer science program.

All prospective Lamar University students who apply to the Lamar University should do so online using the statewide "Apply Texas" system. Incoming students submit a complete high school transcript or GED scores, transcripts of previous college work where more than 18 hours of college credit was earned as well as ACT or SAT scores. This requirement also applies to students with high school dual credit. To qualify for unconditional admission, a student's high school coursework must include: four units of English, three units of math, two units of laboratory sciences, 2 ½ units of social sciences, and 2 ½ credits in college preparatory electives (preferably 2 of those units in coursework related to a foreign language), satisfy the State of Texas Uniform Admission Policy, and graduate in the top 10 percent of their high school class or achieve a minimum composite score on the SAT or ACT exam. Students who are lacking in the course requirements may be admitted at the University's discretion, with a variety of additional enrollment conditions that are imposed to improve opportunities for success at Lamar University. During registration for classes, students accepted through Individual Approval will meet with an advisor who will explain the guidelines, agreements and requirements necessary for enrolling at Lamar University.

New students should also attend an Orientation in the semester before enrolling. Before Orientation, the students should take a Texas Success Initiative (TSI) assessment test to demonstrate readiness for college-level courses. More information on Admissions can be found at the Lamar website at http://beacardinal.lamar.edu/how-to-apply and at http://catalog.lamar.edu/undergraduate-admissions/index.html.

B. Evaluating Student Performance

Students are evaluated based on their performance on tests, quizzes, lab and programming assignments, and written assignments such as essays and research papers. Every course does not necessarily use all of these assessment items. Students enrolled in COSC 4172 (Senior Seminar) also take the ETS Computer Science Major Field Test. This test is given to

graduating seniors, but the scores are used only for assessment of the programs, not for individual grades.

When students first enter the program, they are advised by the Department's designated advisor. Upon making sufficient progress toward their degree (generally upon completion of COSC 2336 (CS 3: Data Structures)), they are assigned a permanent faculty advisor. The University has an online system for students to enroll in courses. Students cannot use the system until their advisor removes the student's advisement hold. The advisor makes sure that students are meeting prerequisites. In addition, the online system will not allow students to register for courses unless the student has successfully completed the corresponding prerequisites. Under extenuating circumstances (e.g., a transfer student with good grades), students may be allowed to take a course normally considered a prerequisite as a co-requisite. This requires approval by the student's advisor or department Chair. If a student has not met the prerequisite for a course and a mistake was made by the online system or human error, the instructor of record may ask the student to drop the course.

Majors are expected to be successful in their chosen discipline. Students who have attempted at least twelve hours of computer science courses and whose GPA in such courses drops below 2.00 will be advised by Student Advising and Retention Services (STARS). These students will be advised by the Department until their GPA increases above 2.0. Students receiving a B.S. in Computer Science are required to have an overall GPA of at least 2.25 and a GPA of at least 2.25 for all courses required for successful completion of the degree program.

No freshman student is allowed to take any senior-level computer science course. A student may not register for the same class more than four times. If a student is registered on the first class day, the course will appear on the student's transcript. Even if the student later drops the course or withdraws from school for that semester (receiving a "Q", or "W" for that course), the course counts as one attempt.

Lamar University has a Grade Replacement Policy which states that students may replace an undergraduate course grade by repeating a course. If a student repeats a course, the official grade is the higher one, although all grades remain on the transcript. Eligibility for university honors is determined on the basis of a cumulative GPA that includes those grades that were replaced. Repeating a course after taking a more advanced class in the same subject is not permitted. Once a degree has been conferred, a student may not replace a grade for any course that was used to award the degree or calculate the cumulative grade point average.

C. Transfer Students and Transfer Courses

Transfer Applicants with Fewer than 18 Credit Hours

Undergraduate students who are transferring with fewer than 18 credit hours of college-level coursework must also satisfy admission requirements for entering freshmen including a satisfactory high school transcript. They submit an online application through the statewide "Apply Texas" system. They should have official copies of all prior college and university

transcripts sent to Lamar regardless of the length of attendance and whether credit was earned. Students transferring with fewer than 18 credit honors also should have SAT or ACT test scores sent to the University.

Transfer applicants who have been academically dismissed from the last institution they attended but meet the GPA requirements listed above are not considered for admission until at least one regular semester (fall or spring) has elapsed. After this period, these applicants must submit a new application.

Students who meet the high school requirements but do not have a 2.00 GPA on attempted college coursework may be considered for admission. These applicants are reviewed by the office of Student Advising and Retention Services. Students' major, types of courses taken, and pattern of progress, as well as high school records and standardized test scores, are considered in the admissions process.

Transfer Applicants with 18 Credit Hours or More

Students who are transferring with 18 or more credit hours of college-level coursework must meet the following requirement: Have earned an overall combined 2.00 GPA (as computed by Lamar University) on all transfer hours attempted and be eligible to re-enter all colleges and universities previously attended. Students who have failed any college readiness coursework are not eligible for admission until they have completed these courses with a passing grade.

Students who do not meet the requirement above can be considered for admission at the discretion of the University on an individual basis. These applicants write a one- to two- page statement in which they account for past academic shortcomings, suggest steps they will make to address those weaknesses, and specify the academic goals they plan to achieve while studying at Lamar University. Students may also include letters of recommendation from people familiar with their academic background and pertinent information such as participation in extra-curricular activities or specialized skills.

The Admissions Office evaluates transfer students' transcripts to determine transfer credit for the general education requirements and some lower-division courses. The Department's designated advisor, Dr. Bo Sun, checks transfer students' syllabi and grades to determine transfer credit for most major courses.

At the present time, there are no state-mandated articulation requirements impacting transfer students. We do have Articulation Agreements with Lamar State-Orange and Lee College.

Transfer students can use an online credit evaluation tool to determine how completed coursework will be counted towards a degree at Lamar. Credit earned at other accredited institutions is judged for Lamar University credit using the following guidelines:

1. All courses are used to calculate the transfer GPA, which is used to determine admission status.

2. Grades of D are transferable, but departments may refuse to accept the grades toward a degree.
3. Transfers from a two-year college are limited to 66 semester hours of transferable credit. No two-year college credits will be accepted for junior-senior credits.
4. Transfer students can expect to be informed of the amount of transfer credit awarded within two weeks of acceptance. In some circumstances, evaluation may take a longer time, but it must be completed by the end of the student's first academic semester at Lamar University.

   More information on procedures for Transfer students can be found at http://beacardinal.lamar.edu/how-to-apply/transfers.html.

D. Advising and Career Guidance

All new students go through an orientation process either as a part of the University's New Student Orientation sessions or with the Department upon their arrival. During this orientation process, students are walked through all degree requirements and are told how to obtain further information. Each new student is also given an information packet that includes a summary of all of the degree requirements. Initially, all incoming students (new or transfer) are advised by the Department's designated advisor, Dr. Bo Sun, and by the Undergraduate Advising Center. A schedule for the Fall 2013 University Communication Advising Plan is shown in Appendix L-2**.** The Undergraduate Advising Center is responsible for the initial orientation process, and its services are available at any time for incoming students who have questions or need extra assistance in making the transition from high school. Services available include time management and tutoring. Students with poor academic backgrounds must sign an "I WILL" agreement and take University approved one credit hour course to improve their study habits. Appendix L shows the forms used by the Undergraduate Advising Center for the "I WILL" program, advisement, retention, and tutoring requests.

Dr. Bo Sun advises all of the majors in Computer Science during the first two years in which the student is accepted as a major. A permanent faculty mentor/advisor is assigned to the student upon completion of COSC 2336 (Computing Fundamentals III: Data Structures), or as circumstances warrant. The faculty mentor then handles advising duties for the student for the rest of his or her academic career at the University. All advisors are available year-round to mentor and guide students. When the student is ready to apply for graduation, Dr. Bo Sun checks over the degree plan to ensure that all requirements have been met. He then submits a degree plan for the student to the Graduation Officer in the Office of the Registrar. Students take COSC 4172 (Senior Seminar) during their last semester, which makes it easy to communicate with seniors planning on graduation. A flowchart for the Advisement Procedures in the Department of Computer Science is shown in Figure 1-2.

The University has an online degree audit tool called DegreeWorks that supports advising. In particular, the tool lists the outstanding courses that a student needs to graduate. Courses are subdivided into the categories of General Education requirements, College of Arts and

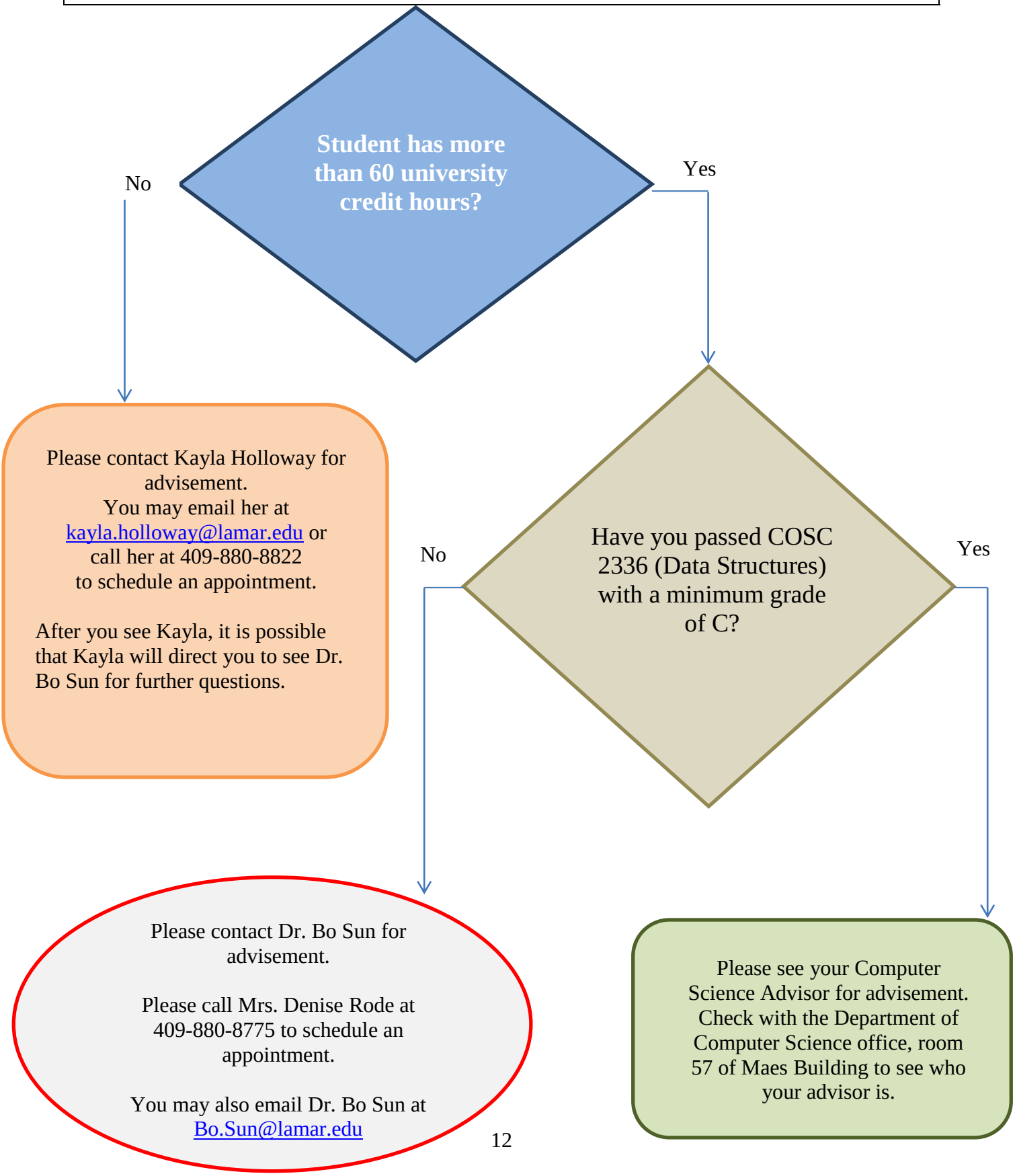
Sciences requirements, and Computer Science major requirements. Both advisors and students may access DegreeWorks from any Internet-connected computer.
Towards the end of every semester, students are required to contact their advisor to review which courses they need to take the next semester. During this time, advisors ensure that students are on the right track for graduation, advise them on how to best complete the requirements given the upcoming course offerings, and inform students of any upcoming changes that may affect their ability to complete the degree. Unless students contact the advisor assigned to them, they are unable to register for classes. The Department's designated advisors are available for backup in case the student's advisor of record is unavailable. In addition, students have access to the University's online undergraduate catalog and online unofficial transcripts and a departmentally produced master checklist for the degree. These items allow students to easily keep track of where they are in the program, allowing them to perform some measure of self-advising.

E. Work in Lieu of Courses

If a student requests credit for work experiences in lieu of enrolling in a class, the student must pass a credit exam in the course for which they wish to receive credit. An exception to this rule is if the student has taken the Advanced Placement Test in Computer Science. Credit is given according to the rules given below to those students who have completed an Advanced Placement Test in computer science.

Test	Score	Courses for which Credit Is Assigned
Computer Science A test	4 or 5	COSC 1336
Computer Science AB test	4 or 5	COSC 1336, COSC 1337

Figure 1-2. New Advisement Procedure for Students



F. Graduation Requirements

The name of the degree offered by the Department of Computer Science is the Bachelor of Science in Computer Science. To obtain the degree, a student must successfully complete 120 semester hours of credit. There are two categories of requirements that students must complete: Philosophy of Knowledge Core Curriculum requirements (48-50) hours and Computer Science major requirements (84-85 hours). The Core Curriculum requirements in Mathematics and Science are satisfied by Computer Science major requirements. These requirements are summarized below.

Philosophy of Knowledge Core Curriculum

I. Philosophy of Knowledge—three semester hours from PHIL 1370 or 1360 (Honors)

II. Methods of Inquiry in the Humanities

- **English Composition**—six semester hours from ENGL 1301, 1360 (Honors), 1302, 1361 (Honors) or 1374
- **Literature**—three semester hours from ENGL 2310, 2320, 2322, 2326, 2331, 2360 (Honors), 2371 or 2376
- **Communication**—three semester hours from COMM 1315, 1360 (Honors), 2335, 2373, 3310, 3340, FREN 1311, GERM 1311, SPAN 1311 or DSDE 2375.
- **American History**—six semester hours from HIST 1301, 1302, 1361 (Honors), 1362 (Honors), 2301
- **Fine Arts**—three semester hours from ARTS 1301, DANC 2304, HUMA 1315, MUSI 1306, THEA 1310 or COMM 1375.

III. Methods of Inquiry in the Sciences

- **Political Science**—six semester hours: POLS 2301 and 2302
- **Mathematical Science**—Six to seven semester hours at or above MATH 1314 or 1414 and three to four semester hours in mathematics (at or above the content level of trigonometry, MATH 1316) or quantitative analysis (BUAL 3310, MATH 1342, MATH 3370 or PSYC 2471).
- **Laboratory Sciences**—eight semester hours from BIOL 1406, 1407, 1408, 1409, 2401, 2402, CHEM 1406, 1408, 1411, 1412, 1460 (Honors), GEOL 1403, 1404, PHYS 1401, 1402, 1405, 1407, 1411, 2425, 2426.
- **Social Science**—three semester hours from ANTH 2346, 2351, ECON 1301, 2301, 2302, PSYC 2301, SOCI 1301 or INEN 2373.

IV. Physical Education Activity—one semester hour of physical activity, dance or marching band. (students with physical limitations, those over 25 years of age, and those who have completed basic training in a military service are exempted from this requirement,

but they must have an additional elective credit hour to replace the one semester hour of physical activity, dance or marching band).

Computer Science Major

- **Mathematics (20 or 21hours)** — MATH 2413, MATH 2305, MATH 2414, MATH 3370, MATH 2318 (Now MATH 3318), MATH 3351 or MATH 3435.

- **Laboratory Sciences (12 hours)** — Three lecture/lab courses from the collection PHYS 2425, PHYS 2426, CHEM 1411, CHEM 1412, BIOL 1406, AND BIOL 1407.

- **Electrical Engineering (4 hours) —** ELEN 3431.

- **Computer Science (48 hours)** – COSC 1172, 1173, 1336, 1337, 2336, 2372, 3302, 3304, 3308, 3325, 4172, 4302, 4310, CPSC 3320, 4340, 4360, and two COSC/CPSC/ELEN electives

Academic electives are used to complete the 120 semester hours. In addition, seniors are required to take the ETS Computer Science Major Field Test the same semester that they take COSC 4172. More information about the Core Curriculum can be found at http://catalog.lamar.edu/undergraduate-academic-policies/index.html#philosophy. According to the University Catalog, "students who transfer to Lamar University from another Texas public institution of higher education shall be governed by the provisions of Texas Senate Bill 148 (75th Legislature). Lamar will accept, *en bloc,* an approved core curriculum successfully completed at another Texas public institution of higher education in lieu of Lamar´s core curriculum. Any student who transfers to Lamar University before completing the core curriculum of another Texas public institution of higher education shall receive academic credit at Lamar for each of the courses that the student has successfully completed in the core curriculum of the other institution; however, the student shall be required to complete Lamar´s core curriculum. Students transferring to Lamar from institutions of higher education outside of Texas or from private institutions within Texas shall be subject to the requirements of Lamar University´s core curriculum."

All students who wish to graduate have a University procedure to follow which helps ensure that all requirements have been met. Students and advisors can access the online DegreeWorks tool at any time to check which courses have been completed successfully and which courses are still remaining. Once a student (with assistance from the student's advisor) determines they are close to graduating, the student submits an "Application to Graduate" form to the Registrar's Office indicating the expected graduation semester. The University then reviews the student's records and completes a "Summary of Coursework Remaining" that is then mailed to the student. This summary is the University's official listing of what requirements the student has left to complete for the degree. If there are any inaccuracies or questions about the remaining requirements, Dr. Bo Sun acts as an interface between the student and the University. Once the advisor is certain that the student understands the remaining requirements, both the advisor and the student sign the Degree Plan, which is then returned (by the student) to the University.

From this point forward the University monitors the student's courses. If the student does not sign up for all remaining classes and/or does not complete all requirements during the final semester (as listed on the Degree Plan), the University mails the student a letter. The student must immediately register for the remaining courses and handle any other remaining requirements or risk not graduating that semester.

If at any time there are changes made to either the Degree Plan or the Summary of Coursework Remaining, it is the responsibility of the party making the change to inform the other interested parties as soon as possible. This includes (but is not limited to) the student transferring in additional courses from outside the University, the advisor agreeing to a change in the requirements for the student, and the University uncovering a discrepancy in the remaining requirements.

G. Transcripts of Recent Graduates

Official transcripts for several recent graduates will be provided to the ABET team. These transcripts list transfer courses and courses taken at the Lamar University by term. Transfer, institution, and overall GPAs are also indicated. Table 1-1 is an example of how the degree requirements discussed in Section 1.F are met by three of the students whose transcripts will be provided. A similar transcript analysis will also be provided separately for each transcript.

Table 1-1. Satisfaction of degree requirements for three students (from their transcripts).

A "T" indicates transfer credit for that course, "S" may mean that the student passed a CLEP exam for the course (e.g. in Transcript 1 ENGL 1302 was a CLEP exam result that was given transfer credit and the grade on the test was an "S"). On the degree plan of the student with Transcript 1 there are listed courses from other schools, but the course numbers were all converted to "GENL 0000" when Lamar University converted from the SIS system to Banner in 2006. Also, the Department allows double majors in Electrical Engineering and Computer Science to substitute ELEN 1100 to COSC 1172. Transcript 3 is an example of a transcript for a double major in EE and CS.

	1	2	3
Core Curriculum			
Communication (2 courses, 6 credit hours)			
ENGL 1301 Composition I	(Summer I 2007) TS	(Spring 2006) A	(Fall 2005) A
ENGL 1302 Comp;osition II	(Summer I 2007) TS	(Sum II 09) A	Spring 2006) A
ENGL 1360 (Honors Composition I)			
ENGL 1361 (Honors Composition II)			
ENGL 1374 (Composition)			
Additional Communication (1 course, 3 credit hours)			
DSDE 2375 American Sign Language I			
COMM 1315			
COMM 1360			
COMM 2335			
COMM 2373			
COMM 3310			
COMM 3340 Interviewing			
FREN 1311 Beginning French I		(Fall 2006) A	
GERM 1311 Beginning German I			
SPAN 1311 Beginning Spanish	(Summer I 2007) T		(Spring 2008) A
Humanities (1 course, 3 credit hours)			
ENGL 2310 British Literature before 1800			
ENGL 2320 British Literature after 1800	(Summer I 2007) TS		
ENGL 2322 British Literature (non-majors)			
ENGL 2326 American Literature			(Fall 2007) A
ENGL 2331 World Literature		(Fall 2009) A	
ENGL 2360 Honors Sophomore LIterature			(Spring 2008) A

ENGL 2371 Masterworks of Asian Literature			
ENGL 2376 African-American Literature			
Additional Humanities (1 course, 3 credit hours)			
PHIL 1370 Philosophy of Knowledge PH313K	(Summer I 2007) T	(Fall 2006) A	
PHIL 1360 Philosophy of Knowledge (Honors)			(Fall 2007) A
Visual and Performing Arts (1 course, 3 credit hours)			
ARTS 1301 Art Appreciation	(Summer II 2007) A		
DANC 2304 Dance Appreciation			
HUMA 1315 Understanding the Arts			
MUSI 1306 Music Appreciation		(Fall 2005) A	
THEA 1310 Introduction to Theatre			
COMM 1375 Film Appreciation			(Spring 2009) A
History (2 courses, 6 credit hours)			
HIST 1301 U.S. History I: 1763-1877	(Summer I 2007) T	(Spring 2006) B	
HIST 1302 U.S. History II: 1877 to present	(Summer I 2007) TA	(Fall 2005) A	
HIST 1361 Honors U.S. History: 1763-1877			(Fall 2007) A
HIST 1362 Honors U.S. History : 1877 to present			(Spring 2008) A
HIST 2301 History of Texas			
Government (2 courses, 6 credit hours)			
POLS 2301 American Government I	(May Mini 2008) A	(Spring 2007) A	(Sum II 2009) A
POLS 2302 American Government II	(Summer I 2007) TB	(Spring 2008) B	(Sum II 2012) A
Social & Behavioral Sciences (1 course, 3 credit hours)			
ANTH 2346 Introduction to Anthropology			
ANTH 2351 Cultural Anthropology			
ECON 1301 Principles & Policies		(Spring2006) A	
ECON 2301 Principles of Economics: Macroeconomics			
ECON 2302 Principles of Economics: Microeconomics			
PSYC 2301 General Psychology	(Summer I 2007) TB		
SOCI 1301 Introduction to Sociology			(Spring 2008) A
INEN 2373 Engineering Economics			(Fall 2009) A
Institutionally Designated Option) (1 course, 1 credit hour)			
Physical or Dance Activity Course or Marching Band Longhorn	(Summer I 2007)	(Spring 2009) A	(Fall 2007) A
Electrical Engineering (1 course, 4 credit hours)			
ELEN 3431 Digital Logic Design	(Fall 2009) A	(Fall 2009) A	(Fall 2010) A
Computer Science Major			
Mathematics 6 courses, 20-21 credit hours			
MATH 2413 Calculus I	(Summer I 2007) TA	(Spring 2007) B	(Fall 2008) A

MATH 2414 Calculus II	(Summer I 2007) TB	(Spring 2008) B	(Spring 2009) A
MATH 2415 Calculus III or Math 4360 Modern Algebra Math	(Fall 2009) B	(Spring 2010) B	(Fall 2009) B
MATH 2305 Discrete Mathmatics	(Summer II, 2008) A	(Fall 2008) B	(Spring 2012) A
MATH 2318 Linear Algebra	(Spring 2008) C	(Spring 2009) B	(Sum I 2009) A
Math 1342 or Math 3370 Probability and Statistics	(Summer I 2008) B	(Fall 2008) A	(Fall 2009) A
Laboratory Science (3 courses, 12 credit hours)			
PHYS 2425 Calculus Based Physics I	(Fall 2009) A	(Spring 2010) B	(Spring 2009) C
PHYS 2426 Calculus Based Physics II	(Spring 2010) B	(Fall 2010) B	(Fall 2009) B
CHEM 1411 General Chemistry I			(Fall 2008) B
CHEM 1412 General Chemistry II			
BIOL 1406 General Biology I			
BIOL 1407 General Biology II			
GEOL 1403 General Geology I or SPSC 1401 Space Science	(Spring 2009) B	(Fall 2006) A	
Computer Science (18 courses, 48 credit hours)			
COSC 1172 Thinking, Speaking and Writing in Comp. Sci.	(Summer I 2007) T	(Fall 2005) A	(Fall 2008) A
COSC 1173	(Summer I 2007) T	(Fall 2005) A	(Fall 2008) A
COSC 1336	(Summer I 2007) T	(Fall 2005) A	(Fall 2008) A
COSC 1337	(Summer I 2007) T	(Spring 2006) A	(Spring 2009) A
COSC 2336	(Fall 2007) A	(Fall 2006) B	(Fall 2009) B
COSC 2372	(Summer I 2007) T	(Spring 2007) A	(Spring 2011) B
COSC 3302	(Spring 2009) C	(Spring 2009) C	(Sum 2012) B
COSC 3304	(Spring 2008) A	(Spring 2008) B	(Spring 2010) C
COSC 3308	(Fall 2008) A	(Fall 2008) A	(Fall 2011) A
COSC 3325	(Fall 2007) A	(Spring 2007) A	(Sum 2012) A
COSC 4172	(Spring 2010) B	(Fall 2010) A	(Fall 2012) A
COSC 4302	(Spring 2010) B	(Spring 2009) A	(Fall 2012) A
COSC 4310	(Fall 2009) A	(Fall 2009) A	(Fall 2012) A
CPSC 3320	(Fall 2008) B	(Fall 2008) B	(Fall 2012) A
CPSC 4340	(Fall 2008) C	(Fall 2009) A	(Sum 2012) A
CPSC 4360	(Fall 2008) B	(Spring 2010) A	(Fall 2012) A
COSC/CPSC/ELEN Elective	(Spring 2010) B	(Summer 2009) A	(Fall 2011) A
COSC/CPSC /ELEN Elective COSC 4301	(Summer I 2009) A	(Spring 2010) A	Spring 2011) A

Academic Elective (1 course, 3 semester credit hours)			
Any course of 3 credit hours numbered 1000 to 4999 at Lamar or an equivalent transfer course	(Spring 2010) B	(Fall 2006) A	(Sum I 2010) A

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

University

Lamar University is a comprehensive public institution educating a diverse student body, preparing students for leadership and lifelong learning in a multicultural world, and enhancing the future of Southeast Texas, the state, the nation, and the world through teaching, research and creative activity, and service.

Values

To provide a learning environment of the highest quality and integrity, Lamar University values:

- Our STUDENTS, including their curricular and extracurricular activities;
- Our FACULTY and STAFF, high quality employees who are committed to educating and serving our students;
- Our commitment to DIVERSITY in ideas, people, and access;
- Our collegial ENVIRONMENT with contemporary, functional, and pleasing facilities, a safe campus, and responsible fiscal management;
- Our bonds with SOUTHEAST TEXAS, the STATE, the NATION, and the WORLD, including our alumni and friends, through economic and educational development, research and creative activity, service and outreach.

College

The College collectively involves students in an academic experience of the highest quality based on the following principles:

- To provide an excellent learning environment wherein all students may refine the knowledge and skills essential to cultivate their ability to think critically, communicate effectively, and advance their appreciation of artistic and scientific inquiry;
- To provide a contemporary education through the integration of information technology into the study of disciplines traditionally associated with the arts and sciences; and
- To stress the importance of lifelong learning through community outreach, service, research and creative endeavors.

B. Program Educational Objectives

Program Objectives

Published on the Department of Computer Science website:
Within a few years of graduation, graduates of the computer science program will achieve the following:

1. Graduates of the Computer Science Program will develop the professional skills and the necessary technical knowledge both in breadth and in depth to prepare them for employment or advanced study in Computer Science.
    - Measurement: using Student Learning Outcomes 1, 2 and 3.
2. Graduates of the Computer Science Program will have sufficient awareness of the local and global societal impact of technology and of the ethical issues in computer science to make decisions regarding their personal and professional responsibilities.
    - Measurement: using Student Learning Outcomes 4 and 5.
3. Graduates of the Computer Science Program will have the critical thinking, communication, teamwork, and leadership skills necessary to function productively and professionally.
    - Measurement: using Student Learning Outcomes 6, 7 and 8.
4. Graduates of the Computer Science Program will demonstrate intellectual curiosity and the independent study skills necessary for life-long learning.
    - Measurement: using Student Learning Outcome 9.

Student Learning Outcomes

See Criterion 3. Student Outcomes

C. Consistency of the Program Educational Objectives with the Mission of the Institution

The educational objectives of the Department of Computer Science align with the Lamar University Mission and the College of Arts and Sciences Mission statements since the Department of Computer Science seeks to produce graduates who can be productive in careers in the Computing Sciences and who embrace and excel at lifelong learning. Our program provides students both theoretical and practical foundations needed to be successful. Through classroom and lab activities, opportunities for research, and early involvement in professional organizations, including programming competitions, the Department of Computer Science seeks to educate a well-rounded computing professional capable of independent thinking.

D. Program Constituencies

The program constituencies are students, faculty, staff, and industry partners.

The educational objectives meet the needs of students by providing them with the opportunities necessary to advance their skills to the point they are able to find a job in computing upon graduation from the program. Alternatively, the program also prepares students for graduate study in computer-related disciplines.

The educational objectives meet the needs of faculty by providing opportunities for faculty to impart their knowledge of computing and advance their careers in academia. In addition, for faculty interested in research, the program offers students opportunities to engage with faculty in faculty-sponsored research.

The educational objectives are enhanced by the work of staff since all students need to interact with staff members on academic issues, such as maintaining the grade records, advisement records, preparing the payment for all undergraduate and graduate assistants, and more administrative tasks.

The educational objectives meet the needs of industry partners since graduates of the program are well prepared to enter the workforce. Since the program receives and evaluates continual feedback from industry partners, the program is kept up-to-date with and responds to industry needs.

E. Process for Review of the Program Educational Objectives

Undergraduate Curriculum Committee

The Undergraduate Curriculum Committee meets regularly each academic year to review how various components of the program continue to meet the educational objectives of the program. These include review and adoptions of textbooks, proposals for the deletion or addition of courses to the program, and student feedback.

Assessment Committee

The Assessment Committee meets regularly each academic year. The committee reviews proposals for changes to the assessment procedures for the program based on feedback from students and instructors. The committee also reviews feedback from other sources included, but not limited to the program Advisory Board, other University departments and University administration. As the content of some courses may change or evolve over time, the committee makes sure the assessment procedures for each course are aligned with the educational objectives of the program. At the end of each academic year, the committee reviews assessment data gathered for the program and decides on changes, if any. For this reason, the committee is one of the most important venues for changes that ensure continuous program improvement.

Advisory Board

The program has an Advisory Board consisting of representatives of local, regional, and national companies. Many of the Advisory Board members are Alumni of Lamar University. Each spring the Advisory Board meets for a one-day conference on the Lamar campus. Faculty members, including the Chair of the program, make presentations to highlight important changes in the program such as new facilities, new courses, and progress on research grants or new faculty members hired. The Advisory Board provides feedback to the Department Chair on the state of the program and any recommended changes. The Chair is responsible for presenting any significant feedback from the Advisory Board to the full faculty of the Department. If feedback from the Advisory Board is related to the educational objectives of the program, the Chair is responsible for moving any recommendations to the appropriate Department committees for further consideration and possible action.

All recommendations and proposed changes by the above committees are presented to the faculty and are subject to vote.

CRITERION 3. STUDENT OUTCOMES

A. Student Outcomes

Published on the Department of Computer Science website:

1. Software Fundamentals: Graduates will demonstrate their ability to use fundamental computer science knowledge to design, document, implement, and test software solutions to a wide range of problems, using at least two high-level programming languages.

2. Computer Science Technology Skills: Graduates will demonstrate expertise in the main content areas of computer science including.
    - Discrete and continuous mathematics including skills in logic and proof writing
    - Analysis and design of algorithms
    - Formal languages and computability theory
    - Operating systems
    - Database systems
    - Computer architecture
    - Computer networks and distributed computing concepts

3. Scientific Method: Graduates will be able to gather requirements, analyze, design and conduct simulations or other computer experiments and evaluate and interpret the data generated.

4. Societal Awareness: Graduates will be aware of and understand the impact of computer technology on society at large, on the workplace environment, and on individuals.

5. Ethical Standards: Graduates will be able to recognize and understand the importance of ethical standards as well as their own responsibilities with respect to the computer profession.

6. Collaborative Work Skills: Graduates will demonstrate the ability to work effectively in teams to conduct technical work through the exercise of interpersonal communication skills.

7. Oral Communication Skills: Graduates will demonstrate their ability to communicate clearly.

8. Written Communication Skills: Graduates will demonstrate their ability to write effectively both technical and non-technical materials with appropriate multimedia aids.

9. Continuing Education and Lifelong Learning: Graduates will demonstrate that they can independently acquire new computing related skills and knowledge in order to pursue either further formal or informal learning after graduation.

B. Relationship of Student Outcomes to Program Educational Objectives

Table 3-1 illustrates how ABET criteria are related to the 4 program educational objectives listed in Section 2.B and the 9 student outcomes listed in Section 3.A.

Table 3-1. Mapping of ABET criteria to program educational objectives.

2013-2014 ABET Criteria	Lamar Program Educational Objectives and Student Outcomes
(a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline	Objective 1, Student Outcomes 1 and 2
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution	Objective 1, Student Outcome 1
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	Objective 1, Student Outcomes 1, 2, and 3
(d) An ability to function effectively on teams to accomplish a common goal	Objective 3, Student Outcome 6
(e) An understanding of professional, ethical, legal, security, and social issues and responsibilities	Objective 2, Student Outcome 5
(f) An ability to communicate effectively with a range of audiences	Objective 3, Student Outcomes 7 and 8
(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society	Objective 2, Student Outcome 4
(h) Recognition of the need for and an ability to engage in continuing professional development	Objective 4, Student Outcome 9
(i) An ability to use current techniques, skills, and tools necessary for computing practice	Objective 1, Student Outcomes 1,2, 3
(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.	Objective1, Student Outcomes 1,2, and 3
(k) An ability to apply design and development principles in the construction of software systems of varying complexity	Objective 1, Student Outcomes 1, 2.2

C. Process for the Establishment and Revision of the Student Outcomes

All course instructors who teach courses with outcomes tied to the program student learning outcomes assess and evaluate their courses each semester. This data is entered on the Department assessment website for archival. At the end of the academic year the Assessment Committee reviews these data to see if changes are needed either to specific courses or to the outcomes themselves. In addition, instructors can suggest changes to course content, delivery methods or assigned student learning outcomes. The Assessment Committee review both annual data and ongoing instructor feedback. If changes are recommended by the committee, any such recommendations are sent to the full faculty for

discussion and voting. See Appendix H for a chart showing which courses in the program are used to evaluate student learning outcomes.

D. Enabled Student Characteristics

The 11 ABET Student Outcomes are mapped to the Department Student Outcomes in Table 3-1. The 9 student outcomes are mapped to the four Program Educational Objectives in Table 3-2. The 9 Student Learning Outcomes are mapped to performance criteria in one or more required courses in the program as shown in the Curriculum Map in Appendix H.

Table 3-2. Mapping of program student learning outcomes to program educational objectives.

Student Learning Outcomes	Program Educational Objectives			
	1	2	3	4
1	•			
2	•			
3	•			
4		•		
5		•		
6			•	
7			•	
8			•	
9				•

CRITERION 4. CONTINUOUS IMPROVEMENT

The mission of the Bachelor of Science in Computer Science (BSCS) program is to provide graduates with the fundamental knowledge and habits of critical thinking required for future leadership roles in the numerous fields that depend on the underlying discipline of computer science. We intend to give each graduate a foundation in both the theory and the practice of computer science and to prepare each graduate to take advantage of opportunities for generating new knowledge after graduation. We intend to introduce each graduate to the challenges and joys involved in research that leads to new kinds of computer software and hardware. We intend to provide the knowledge and skills necessary to foster a commitment to lifelong learning and ethical behavior. The faculty believes the mission can only be accomplished through a commitment to assisting student learning through analysis and application, continuous improvement of the program through assessment and evaluation of student needs, and responsiveness to changes in the discipline within a global, social and ethical context.

Our process for regular assessment and evaluation is adopted from the ABET 2012 Symposium sample Self-Study Report from the Lebanese American University and follows the flow shown in Figure 4-1. Definitions of terms used in the flow chart are shown in Table 4-1. The definitions are consistent with similar terms in the ABET Self-Study Questionnaire: Template for a Self-Study Report 2013-2014 Review Cycle.

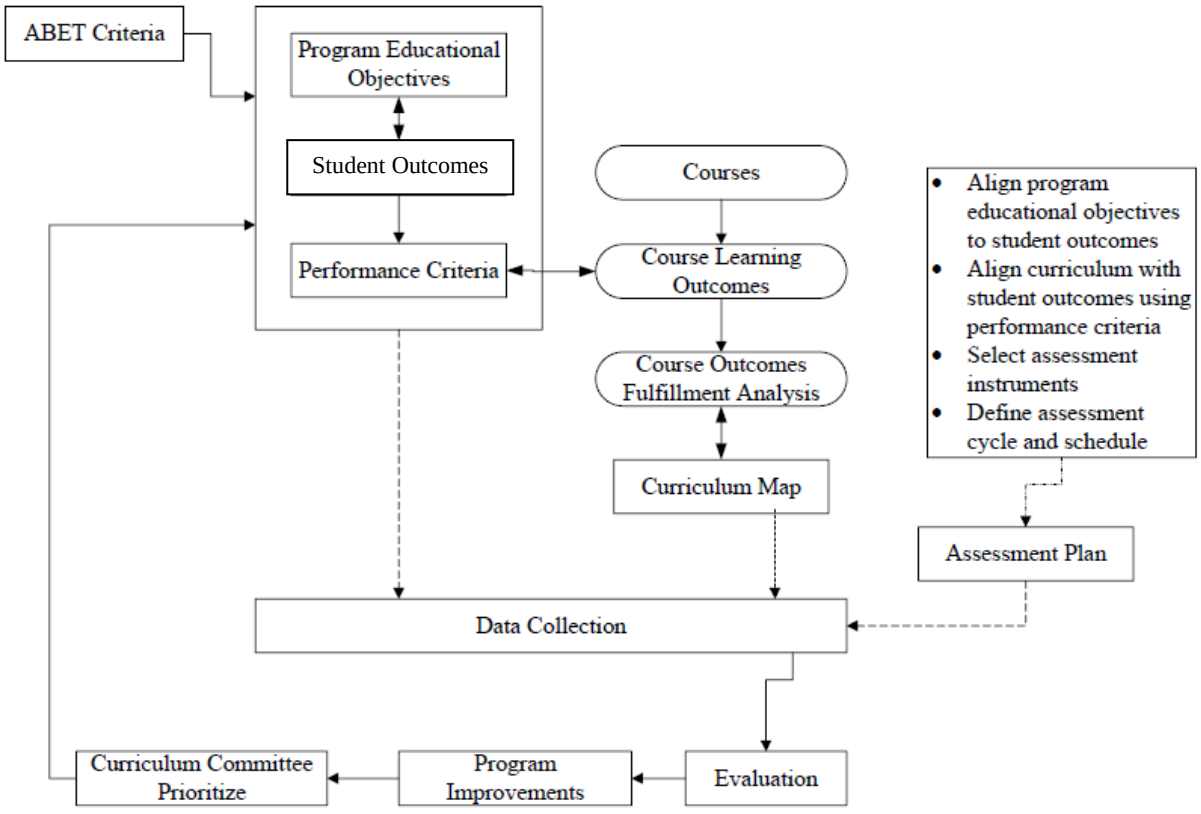


Figure 4-1. The Department's continuous improvement process.

Table 4-1. Definition of terms (from the ABET 2012 Pre-Symposium Workshop).

ABET Terms	Definitions
Program Educational Objectives	Broad statements that describe what graduates are expected to attain within a few years after graduation. They are based on the needs of the program's constituencies.
Student Outcomes	Student outcomes describe what students are expected to know and able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.
Performance Indicators	Specific, measurable statements articulating the key characteristics of the outcome. They enable faculty to "know it when they see it."
Assessment	Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes and program educational objectives. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the objective or outcome being measured. Appropriate sampling methods may be used as part of an assessment process.
Evaluation	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the extent to which student outcomes and program education objectives are being attained. Evaluation results in decisions and actions regarding program improvement.

A. Program Educational Objectives and Student Outcomes

Table 4-2 shows the frequency with which the assessment processes from Figure 4-1 are carried out, and the program constituents responsible for providing the feedback.

Table 4-2. Frequency of Assessment Data Collection.

Constituent Providing Feedback	Assessment Process	Frequency
Instructors	Student Performance in CS Courses on Program SLOs	Once per long semester
Students	Student Course Evaluations	Once per long semester
Students (graduating seniors)	Exit Interview	Once per year
Students (graduating seniors)	Exit Survey	Once per year
Alumni	Alumni Survey	Once per year
Advisory Board	Advisory Board Questionnaire	Once per year
Educational Testing Service (ETS)	Major Field Test	Once per long semester

Below we present each of the assessment processes listed in Table 4-2 in more detail, including:

1) How the data is collected;
2) Is the data direct or indirect;
3) What is the target level of attainment;
4) How the results are documented and maintained.

Student Performance in CS Courses on Program SLOs

This data is collected by instructors during the semester the course is taught and is a direct assessment of student learning outcomes. The procedure for assessment of student performance varies by outcome and by course and can include performance measurements from assignments, tests and rubrics. Those procedures are listed in Appendix E.1. Student performance data is only included in these assessments for students who successfully pass the course. For COSC 1336 and 1337 a grade of 'B' or better is required to pass the course. Otherwise, students are required to retake the course. For all other courses, a 'C' or better is required to pass a course. We take this approach because we want to assess the quality of performance for students who are at least minimally progressing through our program. For students below the minimal level of progression, we do not feel it is appropriate to include that data since it would not provide an accurate overall view of student performance for students who complete our program of study.

Our target for the level of attainment of student performance on course assessment instruments is 80% or better.

The results of these direct assessments are uploaded at the end of each semester on our internal Department assessment website. Also, each summer, an extensive annual ABET report is created (similar in scope to this self-study) and archived on the Department website. These annual assessment reports are available to the public.

Student Course Evaluations

This data is collected via an online submission system for evaluations administered by the University. This data is an indirect assessment of student learning outcomes. A common evaluation form is used for all computer science courses and is listed in Appendix F.1.

Our target for the level of attainment on student evaluations for each course is 3.75 or better on a 5.0 scale.

The results of these indirect assessments are sent to the Department Chair after the conclusion of each long semester via an email link that allows both the Department Chair and individual instructors to view the assessment data in a web-hosted environment. This online data is archived by the University and can be reviewed when needed. In addition, this data is included in the Department Annual ABET Report. Data from this year (2012-2013) is listed in Appendix G.3.

Exit Interview & Exit Survey

This data is collected in COSC 4172 and indirect assessments. A common form is used for both the Exit Interview and Exit Survey. The Exit Interview form is listed in Appendix F.2. The Exit Survey Form is listed in Appendix F.3.

See Appendix E.2 (Criteria for Satisfactory Performance) for a complete listing of the targets for level of attainment on the Exit Interview and Exit Survey.

Results are maintained by the Department secretary and a summary of the results are included in the Department Annual ABET Report. Data from this year (2012-2013) is listed in Appendix G.4 (Exit Interview) and G.5 (Exit Survey).

Alumni Survey

This data is collected via U.S. mail and is an indirect assessment. A common form is used and is listed in Appendix F.4. The survey is sent to alumni who have graduated at least 3 years previous and not more than 8 years and who have not responded to another alumni survey.

See Appendix E.2 (Criteria for Satisfactory Performance) for a complete listing of the targets for level of attainment on the Alumni Survey.

Results are maintained by the Department secretary and a summary of the results are included in the Department Annual ABET Report. Data from this year (2012-2013) is listed in Appendix G.6.

Advisory Board Questionnaire

This data is collected by providing Advisory Board members a paper copy of the questionnaire during the day-long Advisory Board meeting each spring. In spring 2013 was the first time we used the paper format. The questions and responses for this year are listed in Appendix G.7. We expect the format of the questionnaire may change from year to year. In the past the Department Chair has recorded notes about the meeting and the feedback given by members at the conclusion of the meeting.

Since this data is neither a direct nor an indirect measure of the program, there is no specific level of attainment expected. The information gathered is used by the Department to better understand more fully the needs of these constituents. Thought-provoking ideas are relayed to the general faculty for discussion as appropriate.

Results of the questionnaire are included in this self-study, and we expect to continue to document these results in each annual ABET report.

Major Field Test

This data is an indirect measure of the program. The test and the contents of the test are administered by the Educational Testing Service (ETS).

See Appendix E.2 (Criteria for Satisfactory Performance) for a complete listing of the targets for level of attainment on the Major Field Test.

Results are maintained by the Department secretary and a summary of the results are included in the Department Annual ABET Report. Data from this year (2012-2013) is listed in Appendix G.8.

B. Continuous Improvement

The process of gathering, archiving, assessing and summarizing the data used to continuously improve the program culminates in meetings of the Department Assessment Committee during the spring and summer semesters. See Appendix J for a complete list of meeting minutes of this committee during the 2012-2013 year. Based on direct and indirect measures, the committee makes recommendations for improvement. These are summarized by outcome. There are 15 individual program student learning outcomes. See Appendix G.1 for a complete list by outcome of the analysis of direct and indirect results from the 2012-2013 assessment cycle as well as recommendations for actions and second-cycle results, if any. The second-cycle results represent follow-up actions based on actions recommended during the previous year assessment.

Detailed analyses of the assessment and actions taken, by outcome, are included in each annual ABET report, including this report (Appendix G.1). Annual ABET reports are available publicly at http://cs.lamar.edu/abet/abethome.htm. Following are summaries of the most important actions taken to improve the program during each of the last five years.

Changes made in 2013

1. Starting next year, we will discuss with prospective instructors for COSC 3304 (Algorithms course) successful methods for teaching analysis of algorithms. The goal will be to see better results on the student evaluations on the question of whether or not students feel they have a firm theoretical understanding of algorithms.

2. In COSC 4172 we will conduct a review of methods for giving an effective presentation.

3. The Assessment Committee will analyze the rubric used to assess criterion 9.3 and determine if it should be modified to include other elements that would indicate if students are capable of independent study.

Changes made in 2012

1. Changed the metric for direct measures – approved by the faculty in fall 2011.

   The Department has decided that instead of using average and standard deviation, instead we will measure the percentage of students that are at least adequate. That target will be at least 80% out of the students who pass a course and meet each performance criterion.

2. Department of Computer Science Programming Documentation Standard – approved by the faculty in fall 2011.

   During a faculty meeting in fall 2011, the Department discussed the need for more instruction on software documentation and formed the Programming Documentation Committee consisting of Professors Stefan Andrei and Kami Makki. The committee proposed a Programming Documentation Standard, which was approved by the Department in fall 2011. Faculty in the courses with primary instruction in documentation and design have added the requirement to their courses. The Department of Computer Science Programming Documentation Standard is available in Appendix I.

Changes made in 2011

1. Add student evaluation question 10 to the student evaluation Outcome 7 in COSC 3325 and CPSC 4360.

   As shown in the table below, the Department has added student evaluation question 10 to the student evaluation Outcome 7 in CSOC 3325 and CPSC 4360 in order to better assess oral communication skills.

Outcome	Course Evaluations	Student Evaluation Questions 2009-2010	Student Evaluation Questions 2010-2011
7	COSC 1172 COSC 3325 CPSC 4360	1,2 18 1,2	1,2 10,18 1,2,10

2. Removed Math 1342 as an alternative to Math 3370 as a requirement for Probability and Statistics because Math 1342 does not require calculus which the Department felt was necessary for an adequate knowledge of the subject.

Changes made in 2010

1. The University will begin offering instructor course evaluations in online format starting in spring.

   Until the end of fall 2009, the evaluations have been administered at the end of each fall and spring semester. The departmental administrative associate was previously assigned

the task of creating a schedule at the end of each semester and visiting classes for evaluation. Following that, the University Computing Center processed the evaluations and generated results for the Department. The Department uses the results for ABET assessment.

Beginning in spring 2010, the University Computing Center stopped the data processing service which made it difficult for the Department to obtain evaluation results. In addition, the Department administrative associate had a major surgery at the end of spring 2010 and had to take a leave for six weeks. So the Department decided to transfer the evaluations to the University Assessment Office in spring 2010. Department-specific evaluation questions were added to the University online evaluations, which are conducted at the end of each fall and spring semester. The Department intends to use the University online evaluation system in the future, because a comprehensive analysis of the data is provided by the system.

Note for spring 2010, question 17 of the Department-specific evaluation questions (question 41 of the University evaluations) was not given to students during the online evaluation period, so there were no results for that question. The Department will contact the University Assessment Office to have the problem resolved.

Question 17: the ability to obtain and use information about the local and global impact of the field on relevant societal issues

2. Add Exit Survey into indirect measures of student outcomes.

   Exit surveys of graduating seniors are given every semester to graduating seniors in COSC 4172 Senior Seminar. In summer 2010, the Department decided to add the Exit Survey into the Procedures for Measuring Each Program Outcome Indirectly.

   In the Procedures for Measuring Each Program Outcome Indirectly for Outcome 4 assessment, question 17, collected from evaluations in CPSC 4360, is added. The changes are shown below, and the updated Procedures for Measuring Each Program Outcome Indirectly are shown in Appendix E.2.

Outcome	Course Evaluations	Student Evaluation Questions (Done every semester)	Exit Survey Questions (Done every semester for graduating seniors)
4	CPSC 4360	17	_
5	_	_	16
7	_	_	13
8	_	_	12
9	_	_	9,11

3. Change context for assessment in Student Outcome 2.2.

   The context for assessment and the assessment coordinator have been changed in one of the performance criteria for Student Outcome 2.2 as shown in the table below.

				2008-2009		2009-2010	
Performance Criterion	Strategies	Assessment Method(s)	Time of Data Collection	Context for Assessment	Assessment Coordinator	Context for Assessment	Assessment Coordinator
Demonstrate familiarity with standard searching and sorting algorithms and linear and non-linear structures.	COSC 2336, COSC 3304	Selected Questions from Final Exam in COSC 2336	Spring and Fall each year	COSC 2336	Mr. Myers Foreman	COSC 3304	Dr. Quoc-Nam Tran

4. Add CPSC 4360 Introduction to Software Engineering to the context for assessment in Student Outcome 4.

   In order to insure that social impact of computing is taught throughout the curriculum, the Department has added CPSC 4360 to the Context for Assessment in Student Outcome 4 Criteria 2 and 4, as shown in the table below.

			2008-2009			2009-2010		
Performance Criteria	Strategies	Assessment Method(s)	Time of Data Collection	Context for Assessment	Assessment Coordinator	Time of Data Collection	Context for Assessment	Assessment Coordinator
Demonstrate knowledge of positive social impacts including information globalization, E-Commerce, E-learning and new job creation.	COSC 1172, COSC 3325, CPSC 3320, CPSC 4340, CPSC 4360	Selected Questions on Final Exam	Spring each year in COSC 3325, and Fall each year in CPSC 4360	COSC 3325 and CPSC 4360	Dr. Hikyoo Koh and Dr.Peggy Doerschuk	Spring each year in COSC 3325, and Fall each year in CPSC 4360	COSC 3325 and CPSC 4360	Dr. Hikyoo Koh and Dr. Stefan Andrei
Demonstrate basic understanding of intellectual property protection via copyright and patent law and fair use exception for copyrighted software.	COSC 3325, CPSC 4340, CPSC 4360	Local Exam Questions	Spring each year in COSC 3325, and Fall each year in CPSC 4360	COSC 3325 and CPSC 4360	Dr. Hikyoo Koh and Dr.Peggy Doerschuk	Spring each year in COSC 3325, and Fall each year in CPSC 4360	COSC 3325 and CPSC 4360	Dr. Hikyoo Koh and Dr. Stefan Andrei

Changes made in 2009

1. A review of the 2009 ABET criteria revealed a change in language to reflect "local and global impact" of technology. This was absent from our student outcomes, our courses, and our assessment instruments. Educational Objective 2 was changed to read "Graduates will have sufficient awareness of the local and global impact of technology and of the ethical issues in computer science to make decisions regarding their personal and professional responsibilities." This led to changes in courses COSC 3325 (Computer Ethics and Law), CPSC 3320 (Networking), CPSC 4360 (Software Engineering), and CPSC 4340 (Database Design), and the then to measure the outcome for the future, the phrase "local and global" was added to questions on social impact of computing on the Student Evaluation (question 17), the Exit Interview (question 5) and Exit Survey (question 16). Also, the phrase "local and global" was added to Student Outcome 4, which now states: "Societal Awareness: Graduates will be aware of and understand the local and global impact of computer technology on society at large, on the workplace environment, and on individuals.

2. The review of 2009 ABET criteria showed that ABET required accredited programs have Student Outcomes equivalent to ABET Student Outcomes. As a result, the Department mapped the new ABET Learning Outcomes to Department Learning Outcomes. The mapping is shown in Table 3-1.

3. After reviewing the new ABET criteria for 2009, the Department began measuring Program Educational Objectives as well as Student Outcomes by way of Alumni Surveys, Exit Interviews, and Exit Surveys. Educational Objectives will be reviewed annually by the Industrial Advisory Board.

4. Several faculty members of the had questions concerning how much students felt that they learned from employment as interns or in coop positions as compared to what they learned in class. Faculty likewise wanted graduating seniors to reflect upon their experiences to determine what had given them the most confidence and satisfaction during their years of work at Lamar. As a result, questions have been added to the Exit Interview regarding these topics: Internship and COOP experiences; student's perceived ability to design a software system, a component, or a process to meet realistic constraints; what students were most proud of learning at Lamar, and what courses or experiences contributed the most to that learning.

5. Changed the previous wording of "Objectives" to "Educational Objectives" to meet ABET's new Harmonization criteria and modified the wording to read: Computer Science Program Educational Objectives. See Section 1.1.2.

6. The phrase "Learning Outcomes" has been changed to read "Student Outcomes" to conform with ABET's new terminology. This did not result in any changes to the wording of the Outcomes.

C. Additional Information

Copies of assessment instruments for indirect measures are listed in Appendix F. Direct measure instruments include individual course rubrics plus assignments and test questions used to assess ABET-related student learning outcomes. At the end of each semester, instructors upload and archive these assessment instruments to the Department internal website. Procedures for utilizing assessment instruments, both direct and indirect, in the Department's assessment methodology are given in Appendix E.

Meeting minutes of the Assessment Committee during 2012-2013 are listed in Appendix J. Meetings minutes of other committees are archived by the Department secretary and are available upon request. These include minutes from general faculty meetings as well from Undergraduate Curriculum Committee meetings.

CRITERION 5. CURRICULUM

A. Program Curriculum

1. Details of the Bachelor of Science in Computer Science (BSCS) program curriculum are given in Table 5-1. In Lamar University, the schedule is a semester system. In Table 5-1, S12 and S13 denote Spring 2012 and Spring 2013, respectively. F12 and F13 denote Fall 2012 and Fall 2013, respectively. Summer12 denotes Summer 2012.

2. Our BSCS program has the following four objectives:

    a. Graduates will be able to demonstrate skills in problem solving and sufficient technical expertise to begin either immediate employment or advanced study in Computer Science.
    b. Graduates will have sufficient awareness of the societal impact of technology and of the ethical issues in computer science to make decisions regarding their personal and professional responsibilities.
    c. Graduates of the Computer Science Program will have the critical thinking, communication, teamwork, and leadership skills necessary to function productively and professionally.
    d. Graduates of the Computer Science Program will demonstrate intellectual curiosity and the independent study skills necessary for life-long learning.

    The curriculum has been aligned with the program educational objectives in the following ways:

    Clearly, we expect the curriculum to prepare our students for employment and/or graduate study. Consequently, our students must learn the material concerning analysis, design, implementation, and testing of software. Also, our students must be shown problems that require construction of mathematical models and algorithms that represent solutions. Our curriculum not only teaches students how to do this but also how to translate the solutions into computer programs. Programming Fundamentals I, II, and III, Algorithm Design & Analysis, Software Engineering, Database Design, Computer Architecture, Operating Systems, and many other courses contribute to the achievement of Objective I.

    Objective II is directly addressed in COSC 3325, the Computer Law and Ethics course, but other courses also mention issues in societal impact and ethics. Some of these courses are Computer Networking, Database Design, Thinking, Speaking, and Writing in Computer Science, and Senior Seminar.

    Objective III is addressed by a set of courses that has been designated to include oral communications, written communications, and team projects. These courses are as follows: Oral Communications: COSC 3325, CPSC 4360, and COSC 1172; Written

Communications: COSC 3325, CPSC 4360, COS1172, CPSC 4340, and COSC 4302; Team Projects: COSC 1172, CPSC 4360, CPSC 4340, and COSC 4302.

Objective IV is addressed in the curriculum by courses that require the student independently to find resources in the library or online to solve new problems. Courses like Thinking, Speaking, and Writing in Computer Science, Computer Law and Ethics, Senior Seminar, and Database Design require practice in independent study skills. Lifelong learning is directly discussed with every graduating senior in COSC 4172: Senior Seminar.

Students are well prepared for graduate studies. In particular, Table 5-1 shows how required courses in the BSCS curriculum prepare our students for the core M.S. courses at Lamar University.

Table 5-1. Mapping of required BSCS courses to MS core courses

Required B.S. Courses	M.S. Core Courses
CPSC 4360 (Software Engineering)	CPSC 5360 (Software Engineering)
COSC 4302 (Operating Systems)	COSC 5302 (Advanced Operating Systems)
COSC 3304 (Algorithm Analysis and Design)	COSC 5313 (Algorithm Analysis and Design)
CPSC 3320 (Computer Networks)	COSC 5328 (Computer Networks)

3. The curriculum in the BSCS degree plan and associated prerequisite courses have been structured to support the attainment of the student outcomes

   The details of our current Curriculum Map are in Appendix H.

4. The flowchart shown in Figure 5-1 illustrates the prerequisite structure of our BSCS program's required courses.

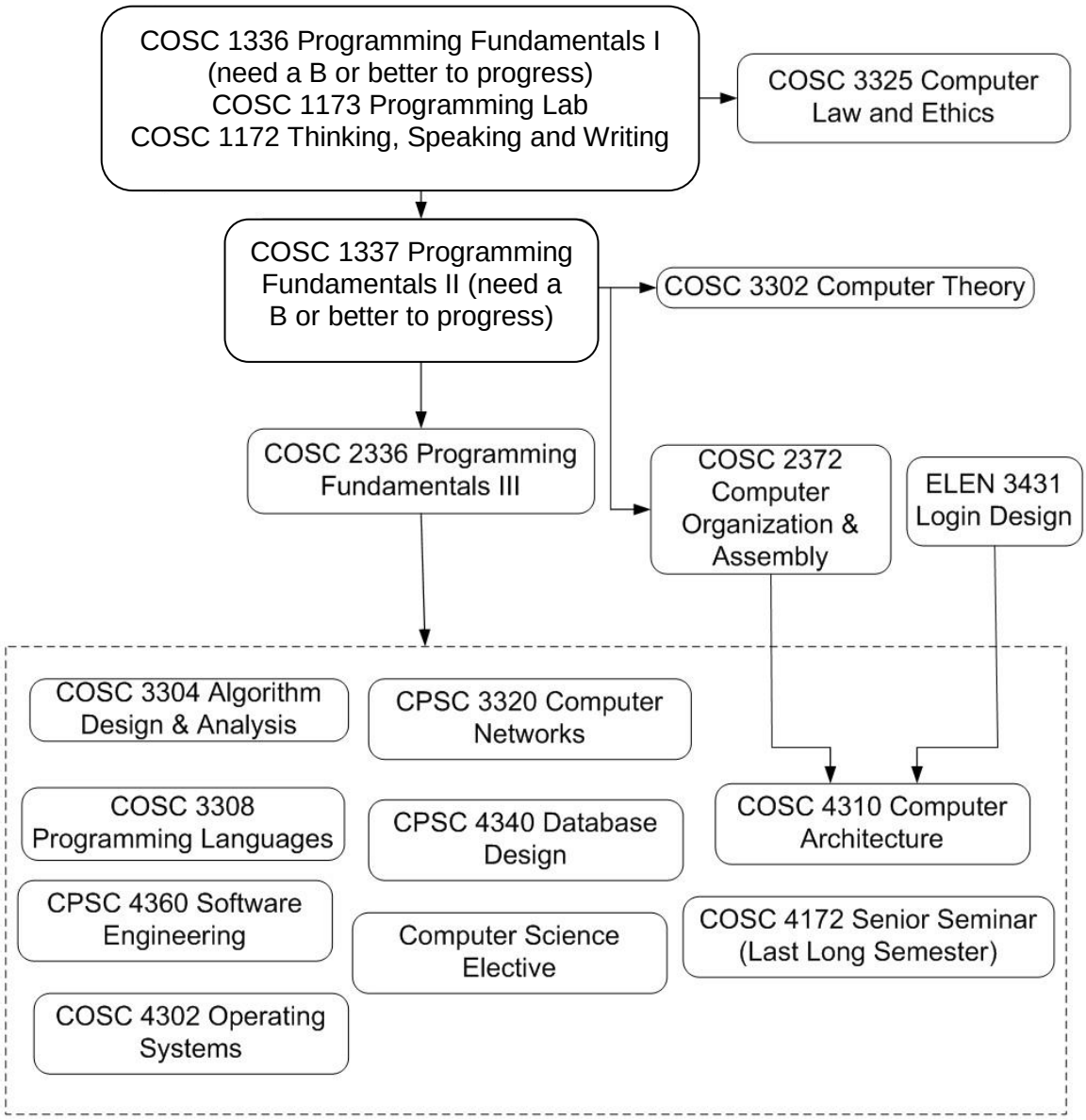


Figure 5-1. Prerequisite Chart of Computer Science Courses

5. From Table 5-1, the total credit hours required for our BSCS degree is 120 hours.

    a. Computer science: One and one-third years that must include:

        i. Coverage of the fundamentals of algorithms, data structures, software design, concepts of programming languages and computer organization and architecture.

        The core materials of our BSCS degree plan provide basic coverage of algorithms, data structures, software design, concepts of programming languages, and computer organization and architecture.

Required Computer Science courses cover these areas:

COSC 1172 Thinking, Speaking, and Writing
COSC 1173 Programming Lab
COSC 1336 Principles of Computer Science I
COSC 1337 Principles of Computer Science II
COSC 2336 Data Structure & Algorithms
COSC 2372 Computer Organization & Assembly
COSC 3304 Algorithm Design & Analysis
COSC 3308 Survey of Programming Languages
CPSC 4360 Software Engineering

ii. Introduction to a variety of programming languages and systems.

The core materials of our BSCS degree plan require the use of a variety of programming languages, such as Assembly, Java, C++, and C. In Design of Programming Languages (COSC 3308), students are introduced to a variety of language concepts used in declarative, functional, concurrent, object-oriented programming languages, and others that illustrate different language paradigms. They also require the use of a variety of systems, such as Windows, Linux, Solaris, and MacOS.

iii. Proficiency in at least one higher-level language.

Java Language is required in COSC 1336 Programming Fundamentals I, COSC 1337 Programming Fundamentals II, and COSC 2336 Data Structures. Proficiency in Java is enforced by requiring a minimum of a 'B' grade in COSC 1336 and COSC 1337. Moreover, students in some junior and senior level courses (such as CPSC 4360 Software Engineering) use Java Programming Language to finish projects. Students are expected to be proficient in Java Programming Language upon completing these courses.

iv. Advanced course work that builds on the fundamental course work to provide depth.

Students pursuing the BSCS degree may study the following advanced topics:

Software Systems: COSC 3304, COSC 4302, CPSC 4360.
Computer Networking: CPSC 3320 and two of (COSC 4345 or CPSC 4320 or Computer Forensics (which is currently running as a special topics course COSC 4301)).
Database Systems: CPSC 4340 and two from COSC 4301 Data Mining (special topic), COSC 4301 Bioinformatics (special topics), or any other COSC 4301.
Theory of Computer Science: COSC 3308, COSC 3302.
Computer Architecture: COSC 4310.

Students also select to take Computer Security, Real Time System, Embedded System, Graphics, Game Development, Artificial Intelligence, Machine Learning, Multimedia Processing, Network System Administration, and Simulation as COSC/CPSC electives.

b. One year of science and mathematics

i. Mathematics.

Students pursuing the BSCS degree are required to take the following Mathematics courses (21 hours):

MATH 2305 Discrete Mathematics
MATH 3328 Linear Algebra I
MATH 2413 Calculus and Analytic Geometry I
MATH 2414 Calculus and Analytic Geometry II
MATH 3435 Calculus and Analytic Geometry III
MATH 3370 Introduction to the Theory of Statistical Inference

ii. Science.

Students pursuing the BSCS degree are required to take three of these courses from the following Lab Science courses (12 hours), in no particular sequence:

BIOL 1406 General Biology I
BIOL 1407 General Biology II
CHEM 1411 General Chemistry I
CHEM 1412 General Chemistry II
PHYS 2425 Calculus-based Physics I
PHYS 2426 Calculus-based Physics II

6. The program does not allow cooperative education to satisfy curricular requirements specifically addressed by either the general or program criteria.

7. The curriculum materials prepared for the 2013 ABET visit include course syllabi, textbooks, sample student work, and other artifacts that will demonstrate achievement related to this criterion.

B. Course Syllabi

See Appendix A for a list of syllabi for each course used to satisfy the mathematics, science, and discipline-specific requirements required by Criterion 5.

Table 5-1. Curriculum

Bachelor of Science in Computer Science

Course (Department, Number, Title) List all courses in the program by term starting with first term of the first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[a]	*Subject Area (Credit Hours)*				Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered[b]
		Math & Sciences	Computing Topics Mark with an F or A for Fundamental or Advanced	General Education	Other		
Freshman Year – Semester 1							
COSC 1336 Principles of Computer Science I	R		F			F12, S13	29
COSC 1173 Programming Laboratory	R		F			*F12, S13*	26
COSC 1172 Thinking, Speaking, Writing	R		F			*F12, S13*	*58*
ENGL 1301 Composition I	R					*F12,S13*	*26*
MATH 2413 Calculus & Analytic Geometry I	R	X				*F12, S13*	*32*
PHIL 1370 Philosophy of Knowledge	R			X		*F12, S13*	*73*
Freshman Year – Semester 2							
COSC 1337 Principles of Computer Science I	R		F			*F12, S13*	*14*
Communications | Modern Language[3]	SE			X		*F12, S13*	*20*
Social Science Elective[4]	SE			X		*F12, S13*	*15*
ENGL 1302 | 1374 Composition II	R			X		*F12, S13*	*25*
MATH 2305 Discrete Math	R	X				*S12, S13*	*35*
PEGA	R			X		*F12, S13*	*20*
Sophomore Year – Semester 1							
COSC 2336 Data Structure & Algorithms	R		F			*F12, S13*	*15*
ENGL Literature	R			X		*F12, S13*	*20*
MATH 2414 Calculus & Analytic Geometry II	R	X				*F12, S13*	*32*
Approved Lab Science[5]	SE	X				*F12, S13*	*80*
History 1[6]	R			X		*F12, S13*	*43*
Sophomore Year – Semester 2							

COSC 2372 Computer Organization & Assembly	R		F			*S12, S13*	*20*
COSC 3304 Algorithm Design & Analysis	R		A			*S12, S13*	*21*
MATH 3328 Linear Algebra	R	X				*F12, S13*	*32*
Approved Lab Science[5]	SE	X				*F12, S13*	*80*
History 2[6]	R			X		*F12, S13*	*35*
Junior Year – Semester 1							
ELEN 3431 Digital Logic Design	R					*F11, F12*	*34*
CPSC 3320 Computer Networks	R		A			*F11, F12*	*19*
COSC 3308 Programming Languages	R		A			*F11, F12*	*14*
MATH 3370 Theory Statistical Inference	R	X				*F12, S13*	*30*
Approved Lab Science[5]	SE	X				*F12, S13*	*80*
Junior Year – Semester 2							
COSC 3325 Computer Law & Ethics	R					*Summer12, S13*	*15*
CPSC 3302 Computer Theory	R		A			*S12, S13*	*9*
CPSC 4340 Database Design	R		A			*Summer12, F12*	*11*
MATH 3435 Calculus & Analytic Geometry III	R	X				*F12, S13*	*33*
Academic Elective[8]	E			X		*F12, S13*	*30*
Senior Year – Semester 1							
COSC 4302 Operating Systems	R		A			*F12, S13*	*25*
COSC | CPSC | ELEN Elective7	SE		A			*F12, S13*	*8*
Fine Arts Elective[8]	SE			X		*F12,S13*	*30*
POLS 2301 Introduction to American Government I	R					*F12,S13*	*42*
Senior Year – Semester 2							
CPSC 4360 Software Engineering	R		A			*F12, S13*	*12*
COSC 4310 Computer Architecture	R		A			*F11, S13*	*9*
COSC | CPSC | ELEN Elective7	E		A			*F12, S13*	*8*
COSC 4172 Senior Seminar	R		A			*F12,S13*	*5*
POLS 2302 Introduction to American Government II	R			X		*F12,S13*	*40*
TOTALS-ABET BASIC-LEVEL REQUIREMENTS							
OVERALL TOTAL CREDIT HOURS FOR COMPLETION	120						

OF PROGRAM		

1. **Required** courses of all students in the program, **elective** courses (often referred to as open or free electives) are optional for students, and **selected elective** courses are those for which students must take one or more courses from a specified group.
2. For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the maximum enrollment in each element. For selected elective courses, indicate the maximum enrollment for each option.

Instructional materials and student work verifying compliance with ABET criteria for the categories indicated above will be provided during the campus visit

(1) Communication 1315, 1360, 2335, 2373, 3310, or 3340; or CMDS 2375; or an introductory modern language course.
(2) Two semesters of US or Texas history from among HIST -> 1301, 1302, 2373, 2374, 1361, 1362, 2377, and 2301.
(3) Social Science Electives are: ECON 1301, PSYC 2301, ANTH 2346 or 2351, SOCI 1301, or (both ECON 2302 & ECON 2301).
(4) Fine Arts Electives are: ARTS 1301, DANC 2304, HUMA 1315, MUSI 1306, and THEA 1310.
(5) Approved Lab Science must be chosen from the following six courses: CHEM 1411, CHEM1412, BIOL 1406, BIOL 1407, PHYS 2425, PHYS 2426
(6) Acceptable COSC/CPSC/ELEN electives are: COSC -> 4301 | 4307 | 4309 | 4319 | 4322 | 4324 | 4345
CPSC -> 3316 | 4315 | 4316 | 4320 | 4330 | 4370
ELEN -> 3381 | 4486 | 4387 | 4304 (with approval)

Course indexes offered by various departments needed for the B.S. in Computer Science:

- ANTH: Anthropology
- ARTS: Art
- BIOL: Biology
- CHEM: Chemistry
- COSC: Computer Science
- CPSC: Computer & Information Science
- CMDS: Communication Disorders
- DANC: Dance
- ECON: Economics
- ELEN: Electrical Engineering
- ENGL: English
- GEOL: Geology
- HIST: History
- HUMA: Humanities
- MATH: Mathematics
- MUSI: Music
- PEGA: Physical Activity General
- PHIL: Philosophy
- PHYS: Physics
- POLS: Political Science
- PSYC: Psychology
- SOCI: Sociology
- THEA: Theater Arts

Notes (120 total hours):

1. Communication 1315, 1360, 2335, 2373, 3310, or 3340; or CMD 2375; or an introductory modern language course.
2. Two semesters of U.S. or Texas history from HIST 1301, 1302, 2373, 2374, 1361, 1362, 2377, or 2301.
3. Social Science electives are: ECON 1301, PSYC 2301, ANTH 2346 or 2351, SOCI 1301, or (both ECON 2301 & ECON 2301).
4. Fine Arts Electives are: ARTS 1301, DANC 2304, HUMA 1315, MUSI 1306, or THEA 1310.
5. Approved Lab Science must be chosen from the following six courses: CHEM 1411, CHEM1412, BIOL 1406, BIOL 1407, PHYS 2425, PHYS 2426
6. Acceptable COSC/CPSC/ELEN electives are: COSC 4301|4307|4319|4322|4324|4345; CPSC 3316|4315|4316|4320|4330|4370; ELEN 3381|4486|4387|4304 (with approval).

CRITERION 6. FACULTY

A. Faculty Qualifications

Faculty members who teach courses in the Computer Science program include 9 full time tenured/tenure track faculty members and two full-time instructors. Our department is proud to have faculty with strong records of research, teaching, and funded grants. All but the two instructors have doctoral degrees in computer science or a related field. One full-time instructor has a M.Ed. in Computer Science. He teaches microcomputer applications courses for non-majors. The second full-time instructor is pursuing a Ph.D. in Computer Science. We also have four part-time adjuncts who teach courses for non-majors. The size and qualifications of our faculty are more than adequate to cover all curricular areas of the program. Table 6.1 contains detailed information on faculty qualifications. Appendix B contains faculty resumes.

B. Faculty Workload

The typical teaching load for full-time tenured/tenure track faculty is three 3-credit hour courses per long semester. Many of the faculty members regularly receive release time for participation in grant-funded research and projects, and one has received release time for serving as President of the Faculty Senate. This provides adequate time for teaching, research, and service. Table 6.2 contains detailed information on workload summary.

C. Faculty Size

The size of the faculty is large enough to provide a small student-to-faculty ratio in our classes. This permits one-on-one interactions in many of our classes. The NSF sponsored STAIRSTEP program (Director: Dr. Peggy Doerschuk) provides peer mentoring and tutoring and opportunities for small teams of undergraduate students to engage in research and outreach under the direction of a faculty mentor. Freshmen and sophomores are advised in the new University Undergraduate Advising Center. Computer Science faculty advise juniors and seniors. Each faculty member advises 5 to 10 students. The Department Chair advises graduate students. Dr. Bo Sun is the undergraduate freshman and sophomore advisor for all CS students and oversees undergraduate course scheduling. Dr. Osborne serves as departmental representative with Alumni Relations, including the Computer Science Industrial Advisory Board. Dr. Timothy Roden serves as advisor to Lamar's ACM chapter. There are standing committees on curriculum and assessment, with almost all faculty members serving on one of these two committees. Recommendations of these two committees go to the entire faculty for approval.

D. Professional Development

All faculty members are active in research. Most of our faculty have externally funded grants for research and education. Faculty regularly publish papers in peer reviewed journals and conference proceedings. External funding combined with internal support from the Dean, Provost, and Office of Sponsored Research provides funds for faculty to participate in

professional meetings and conferences. Some faculty participate in ABET workshops and National Science Foundation review panels. Several faculty are active in organizational service with professional conferences. Faculty members also have the opportunity to participate in on-campus faculty development workshops sponsored by the Lamar University Center for Teaching and Learning. Faculty members have been actively engaged in preparing materials for new online courses.

E. Authority and Responsibility of Faculty

Faculty members are responsible for creating and modifying all course materials. Selected tenured faculty members observe classes of tenure track faculty each semester and provide feedback to improve instruction. Faculty and the Computer Science Industrial Advisory Board participate in formulating and modifying the program's learning objectives. The syllabus for each course lists the learning objectives for that course. Student outcomes on individual course objectives are measured by the course instructors. The Department's Assessment Committee has mapped program outcomes to individual courses and developed performance criteria for each outcome. Learning objectives are included throughout the curriculum, in courses that introduce the relevant concepts, others that reinforce the concepts, and summative courses that measure student outcomes on each of the performance criteria for the purpose of assessment. Student outcomes on each of the performance criteria are measured by the instructors of those summative courses. The Department's Curriculum Committee makes recommendations with respect to curriculum changes. These suggestions are voted on by the entire faculty before being adopted and implemented.

Table 6-1. Faculty Qualifications

Bachelor of Science in Computer Science

Faculty Name	Highest Degree Earned- Field and Year	Rank [1]	Type of Academic Appointment[2] T, TT, NTT	FT or PT[3]	Years of Experience			Professional Registration/ Certification	Level of Activity[4] H, M, or L		
					Govt./Ind. Practice	Teaching	This Institution		Professional Organizations	Professional Development	Consulting/summer work in industry
Stefan Andrei	Ph.D. in C.S. 2000	ASC	T	FT	0	17	7		H	H	L
Peggy Doerschuk	Ph.D. in C.S. 1990	P	T	FT	0	23	20		L	H	L
Hikyoo Koh	Ph.D. in C.S. 1978	P	T	FT	0	32	32		L	M	L
Jiangjiang Liu	Ph.D. in C.S. & E 2004	ASC	T	FT	00	9	9		L	H	L
Kami Makki	Ph.D. in C.S. 1997	ASC	T	FT	5	141	6		H	H	L
Lawrence Osborne	Ph.D. in C.S.1989	P	T	FT	0	31	23		L	H	L
Timothy Roden	Ph.D. in C.S. 2005	AST	TT	FT	9	12	1		L	H	H
Bo Sun	Ph.D. in C.S. 2004	ASC	T	FT	0	9	9		L	H	L
Quoc-Nam Tran	Ph.D. in C.S. 1996	P	T	FT	1	14	14		L	H	L
Sujing Wang	M.S. in C.S. 2005	I	NTT	FT	0	7	7		L	M	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. Updated information is to be provided at the time of the visit.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other
2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track
3. Code: FT = Full-time PT = Part-time Appointment at the institution.
4. The level of activity (high, medium or low) should reflect an average over the year prior to the visit plus the two previous years.

Table 6-2. Faculty Workload Summary

Bachelor of Science in Computer Science

Faculty Member (name)	PT or FT[1]	Classes Taught (Course No./Credit Hrs.) Term and Year[2]	Program Activity Distribution[3]			% of Time Devoted to the Program[5]
			Teaching	Research or Scholarship	Other[4]	
Stefan Andrei	FT	COSC 2336(3), COSC 1336(3), COSC 3308(3) - Fall 2011; CPSC 4360/5360(3), COSC 3325(3) – Spring 2012; COSC 3325(3), COSC 5349(3) – Summer 2012; COSC 3308(3), COSC 2336(3), COSC 5100(1) – Fall 2012; CPSC 4360/5360(3), COSC 3325(3), COSC 5369(3) – Spring 2013	30	10	60	100
Peggy Doerschuk	FT	COSC 1371(3), CPSC 4360/5360(3) – Fall 2011 COSC 5369(3), CPSC 4370/5370(3) – Spring 2012 CPSC 4360/5360(3), COSC 4301/5340 (3) – Fall 2012 CPSC 4370/5370(3), COSC 1336(3) – Spring 2013	30	60	10	100
Hikyoo Koh	FT	COSC 4301(3), COSC 1371(3) , COSC 1371(3) – Fall 2011; COSC 5313(3(), COSC 4301(3), COSC 3302(3) – Spring 2012; COSC 5315(3), COSC 4301(3), COSC 3302(3) – Summer 2012; COSC 5315(3), COSC 4301(3), COSC 1371(3) – Fall 2012; COSC 5313(3), COSC 3302(3) – Spring 2013	60	20	20	100
Jiangjiang Liu	FT	CPSC 4330/5330(3), COSC 5100(1), COSC 1172(1) – Fall 2011; COSC 5100(1), COSC 1336(3), COSC 1172(1), CPSC 433/53300(3) – Fall 2012; COSC 4310/5310(3), COSC 1172(1) – Spring 2013	40	40	20	100
Kami Makki	FT	COSC 1337(3), COSC 2336(3) – Spring 2012; CPSC 4340/5340(3) - Summer 2012; COSC 1337(3), CPSC 4340/5340(3) - Fall 2012; COSC 236(3), COSC 1337(3) – Spring 2013	40	40	20	100
Lawrence Osborne	FT	COSC 5328(3), COSC 4172(1), CPSC 3320(3) – Fall 2011; COSC 5350/4301(3) – Summer 2011;	40	25	35	100

		COSC 5328(3), CPSC 3320(3), COSC 4172(1) – F 2011; COSC 5302(3), COSC 4172(1) – Spring 2012; COSC 5309(3) – Summer 2012; COSC 5328(3), COSC 4172(1) – Fall 2012; COSC 434`(3), COSC 5302(3), COSC 5100(1), COSC 4172(1) – Spring 2013				
Timothy Roden	FT	COSC 5349(3), COSC 4301(3), COSC 1336(3) – Fall 2012; COSC 5311(3), COSC 4319(3), COSC 1336(3) – Spring 2013	50	20	30	100
Bo Sun	FT	CPSC 4345/5345(3), COSC 4302(3) – Spring 2012 CPSC 3320(3), COSC 4302(3) – Fall 2012 COSC 4202(3) – Spring 2013	30	40	30	100
Quoc-Nam Tran	FT	COSC 5315(3), COSC 5369(3) – Fall 2011; COSC 3304(3), CPSC 3316(3), CPSC 5340(3) – Spring 2012; COSC 5311(3) – Fall 2012; COSC 3304(3) – Spring 2013	35	50	15	100
Sujing Wang	FT	COSC 1173(1), COSC 1336(3), COSC 1371-02(3), COSC 1371-49(3), COSC 2372(3) – Spring 2012; COSC 1173-01(1), COSC 1173-02(1), COSC 1173-48(1), COSC 1336(3), COSC 1371-07(3) – Fall 2012; COSC 1173(1)-01, COSC 1173-48(1), COSC 1336(3), COSC 1371(3), COSC 2372(3) – Spring 2013	90	10	0	100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution
2. For the academic year for which the Self-Study is being prepared.
3. Program activity distribution should be in percent of effort in the program and should total 100%.
4. Indicate sabbatical leave, etc., under "Other."
5. Out of the total time employed at the institution.

CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

1. Offices

Faculty offices are approximately 110 square feet, which is relatively small. However, the offices have recently been renovated with new furniture, bookshelf, cabinets for document storage, new telephone equipment, and new internal wiring for wireless connectivity as well as fixed network connection. Every tenure-track faculty member, lecturer, and adjunct has a private office. In addition, every tenure-track faculty member has another room designated as a research lab, equipped with computers and electronic systems where faculty and students interact. Offices are in the same building as the classrooms and labs. This gives the student ready access to faculty during regular hours most of the day. The Department Chair's office is in the east wing, second floor of the building near the faculty offices, while the laboratories are on the other opposite side of the second floor. The classrooms are on the first floor. Every office has a telephone, at least one networked PC, a printer, and software similar to what is in the labs, with additional software to support individual research activities. Faculty can also have a scanner upon request to the Department Chair. Every office has at least one chair for visitors.

The offices are on the interior of the building and are windowless. They have automatic fluorescent sensor-detection lighting. All of the faculty offices are mainly located in two hallways.

The Department Office (Room 57 Maes) contains two separate rooms. An outer office is arranged to receive the general public as well as faculty and students. This office contains large filing cabinets, three desks, two computers, a fax machine, and a laser printer. The outer office opens into an inner room (Maes 57-A) that is designed to be more private. Maes 57-A is occupied by the Department Chair, Dr. Stefan Andrei. The outer office is occupied by our Senior Administrative Associate, Ms. Denise A. Rode, and a Student Office Assistant, Mrs. Jenifar Kallul. This area has a table supporting a typewriter and other various office devices.

The Department Chair's office is approximately 190 square feet. It has built-in shelves on one wall and three bookcases on another. A U-shaped desk, filing cabinet, and three visitors' chairs, a computer, and a laser printer fill the space.

In summary, faculty offices are adequate to meet the instructional and professional needs of those who occupy them. Offices are easily accessible to students and are well equipped, if somewhat small.

2. Classrooms

All computer science classes are generally taught in one of four classrooms 106, 107, 109, and 111 in the Maes Building. In addition, classes may meet in one of the labs for hands-on instruction. The labs used for this purpose are: rooms 208, 212, 213, 214, and 215. These labs also provide wireless access capability for students. The size of wired bandwidth for these labs has increased to 1 Gigabits from 100 Megabits in 2012. The Department has InfoFocus and Sharp high luminescence projectors in each classroom and in Room 212 and 213. The classroom 107 is Smart Classrooms with Dell desktop computers, ELMO document cameras, and VCRs. All of the rooms have data connections to the Internet and pull-down screens.

Room 208 has 26 computers, 22 of them running Linux and 4 Apple iMac.

Room 212 has 36 computers running Windows and a number of other software such as (MATLAB, Microsoft Office, Microsoft Visual Studio, Netbeans, Notepad++, Scratch, WinSCP, and Microsoft Expressions).

Room 213 has 26 computers running Windows and a number of other software such as (QTSpim, Adobe LiveCycle, Android SDK Tools, AppInventor, GameStudio A8, MATLAB, Microsoft Expression, Microsoft Office, Microsoft Visual Studio, Netbeans, Notepad++, Scratch, WinSCP, Xming).

Room 214 has 22 computers in which 10 of them are Solaris, 10 are Macintosh and which have software such as (Adobe Creative Suite, Eclipse, Netbeans, Microsoft Office), and 2 running Windows and a number of other software such as (Netbeans Eclipse, PuTTY, Microsoft Office, Basic Micro Studio, MATLAB).

Room 215 has 24 computers running Windows and other software such as (Microsoft Office, Netbeans, Eclipse, ArgoUML, MATLAB, Notepad++,PuTTY, Scratch. Department has also supported by a number of servers which are housed in these labs, such as: 6 SUN Sunfire Server with Linux OS, 1 RACK SUN Storage Tek 1000-42, 6 Linux Server, 2 SUN Ultra workstation with Solaris OS.

The labs that are used for instruction have blackboards or whiteboards. In all the classrooms faculty can bring their laptops and connect to projectors.

The classrooms on the first floor are traditional classrooms with multiple blackboards.

The Department has one VCR stored in the Department office and a video monitor on a wheeled cart. An instructor can carry the VCR to any of the classrooms and show video on the monitor or on the screen in Room 211 through the ELMO.

In our opinion, classrooms are adequately equipped at this time, but we want to have the capabilities of streaming media into the classroom and recording lectures and automatically storing those lectures on a website.

3. Laboratory Facilities

The Department has also a number of research labs. These labs are equipped with the state-of-the-art computer facilities purchased either through the faculty research grants or their start-up fund. These labs are: Real-Time Embedded Systems lab (Dr. Andrei), GPU Education lab (Dr. Osborne), Gaming lab (Dr. Roden), Wireless lab (Dr. Sun), Computer Architecture lab (Dr. Liu), Advanced Systems and Database lab (Dr. Makki), Bio-informative and Data Mining lab (Dr. Tran), Artificial Intelligence & STAIRSTEP lab (Dr. Doerschuk). In these labs faculty conduct their research and work with their students.

Recently, the University has renovated Maes building and has improved the quality of facilities and equipment (such as lighting, bathrooms, etc.) for this building. Also, a number of classrooms and labs have recently been renovated to accommodate our specific needs. In particular, Room 216 will be renovated during summer 2013. Half of the room will be used to house the new Entertainment Computing Laboratory (ECL). The ECL will be used in connection with the new game development courses and game development concentration, to be added to the program in academic year 2013-2014.

The administration accommodated all student requests by installing electric power plugs and land-lane Internet connectors in the open common area located in second floor of Maes Building.

B. Computing Resources

1. Central Computing

The Information Technology Division's Central Computing facility is located in the Cherry Engineering Building, which provides university IT and web services. Faculty and students can use single sign-on through the myLamar Portal to access services including registration, Blackboard, email, and internal web services.

All equipment and software in the Central Computing facility is covered by protected facility environment and maintenance agreements to insure the latest versions of software are installed and maximum uptime is provided to students and faculty. All computer systems are connected to the University's fiber optic backbone using Gigabit Ethernet. The University offers campus-wide wireless and VPN connectivity to the campus network.

The Microcomputer Support & Services Department provides campus-wide support by phone and Internet.

The Microcomputer Support & Services Department provides software to faculty and students such as the Microsoft Office suite covered by a Microsoft License Agreement

site license as well as the Adobe Creative Studio suite which includes Adobe Acrobat and Dreamweaver, among others.

2. Computer Science Department

   The Department of Computer Science server room is located in room 208C of the Maes building. The Department host is 1 rack SUN Storage Tek 1000 with 15 Terabyte disk space for computer science students. The Department also hosts a department file server, application server, web, email, DNS, and database server for teaching purposes. There are six SUN Fire servers, and two SUN Ultra workstations.

C. Guidance

Students can access the Department of Computer Science open labs from 8:00 a.m. to 8:00 p.m. Monday through Thursday, 8:00 a.m. to 5:00 p.m. on Friday, 12:00 p.m. to 5:00 p.m. on Saturday and 12:00 p.m. to 8:00 p.m. on Sunday. Students can also remotely access the Department application server via VPN 24 hours a day, 7 days a week.

D. Maintenance and Upgrading of Facilities

With assistance from the Information Technology Department, the Computer Science Department is responsible for maintaining and upgrading facilities. The Information Technology Department is responsible for switches and networking. Moreover, the Department is responsible for its own computer and software installed on the computer. During the 2012–2013 academic year, the University upgraded the Department switch to 10 Gigabyte bandwidth and re-cabled four computer labs, which upgraded the desktop bandwidth in those labs to 1 Gigabyte.

Each year the Department upgrades all computers in one or two computer labs as a regular refresh cycle.

The Department subscribes to the Microsoft Academic Alliance. Computer science students can freely download a wide variety of Microsoft software including development tools. The Department also maintains subscriptions for MatLab and Oracle database software. Software licenses are renewed regularly and computer equipment periodically.

F. Library Services

The Mary and John Gray Library of Lamar University facilitates access to scholarly information in all forms (within the overall framework of the University's stated mission). The Library has an integrated online computer system, SIRSI/Dynix, which provides access to all print materials and specific segments of electronic resources available in the collection. All electronic resources are available via secure log-in through the databases section of the library webpage (http://library.lamar.edu). Conference Proceedings are available through IEEE CSDL and ACM Digital Library. The Mary & John Gray Library also subscribes to ENGNetBase.

1. Reference services available to students and faculty

   There are four reference librarians and one documents/reference librarian who provide reference service. The reference desk is staffed at all hours when the library is open—a total of 95.5 hours each week. A paraprofessional also assists with the provision of reference service. Reference librarians are available in person to assist students during the following time slots: Mon - Thurs 8a - 8p (12 hours), Fri 8a - 6p (10 hours), Sat 10a - 7p (9 hours), Sunday 2p - 8p (6 hours), total hours: 37 per week. Reference Service also answers questions via chat and SMS texts during the above-listed service hours.

   Furthermore, Interlibrary Loan service is available to all faculty, staff and students for the purpose of procuring needed learning and research sources not owned by the Mary & John Gray Library. A specialized student assistant also assists those with hearing disabilities. In addition to Reference Services as listed above, library instruction sessions for specific classed are available by appointment.

   The Reserves/Current Periodicals Department staff makes available the latest journal, trade magazines and textbooks, and instructor's reading assignments. Frequently used materials are available on a more restricted basis than the regular circulation items. Also from Reserves/Current Periodicals, a patron may use one of nineteen study rooms and self-service coin operated photocopy machines. The study rooms are each equipped with a 10 MB/s Ethernet connection and power. The study rooms are for group study and for patrons who wish to use their laptop or palmtop to connect to Internet sites or their email accounts.

   The InterLibrary Services Department provides an online form from the library web page. The requests are checked by the staff and processed immediately. A two-week turn-around of materials is average but delivery often takes place within two to three days. The research databases are accessible both on-campus and by remote access virtually 24 hours a day, 7 days a week, with only periodic interruption for server maintenance. Hours of library: Library Hours: Mon-Thur: 7:30 a.m. - 11:45 p.m., Friday: 7:30 a.m. - 5:45 p.m., Saturday: 10:00 a.m. - 6:45 p.m.,Sunday: 2:00 p.m. - 11:45 p.m. Also, the Computer Science print books and bound journals are arranged according to Library of Congress Classification numbers, which automatically collocates the majority of Computer Science print collection together on one floor (5th).

2. Library Staffing

   The division of labor is organized under the Director of Library Services provided below. The administrative offices headed by the Director of Library Services consist of Access Services, Acquisitions, Cataloging, Government Documents, Interlibrary Loan Services, Periodicals/Reserves and Reference Services, Special Collections and Lamar University Archives. The Library is committed to the following initiatives: 1) Teaching information literacy skills that promote academic success and continuous learning; 2) Developing appropriate collections and making them discoverable; 3) Designing and delivering efficient services within a collegial educational environment; 4) Providing leadership in the creation of campus information policy. A complete list of staff and faculty is also available at http://biblos.lamar.edu/lib/info/personnel.htm.

Director of Library Services
David Carroll, M.A., University of Denver

Access Services
Mark Asteris, M.L.S., Villanova University
Access Services Coordinator

Acquisitions
Sarah Tusa, M.L.I.S., University of Texas-Austin; M.A., Trinity University
Coordinator of Collection Development & Acquisitions,

Cataloging
Jon Tritsch, M.L.S. Emporia State University; M.A. Sam Houston State University
Interim Cataloging Coordinator

Government Documents
Theresa Hefner-Babb, M.L.I.S., University of Oklahoma; M.A., Lamar University
Instruction Coordinator/Government Documents Librarian

Interlibrary Loan Services
Severa Norris, Library Supervisor

Periodicals/Reserves
Annette Stanfield, Library Supervisor

Reference Services
Karen Nichols, M.L.S., University of North Texas; M.S., Lamar University
Coordinator of Reference Services

Special Collections and Lamar University Archives
Penny Clark, M.A. Emporia State University; M.A. University of Kansas
University Archivist

Systems
Sharon Kelley
Systems Software Analyst

3. Database computer search capabilities available to students and faculty

   The Library subscribes to several electronic resources to facilitate research for undergraduates, graduates, and faculty of the Department of Computer Science. These include: ACM Digital Library, IEEE ASPP, IEEE CSDL, Computer Abstracts, ENGNetBase, COMPENDEX, Science Citation Index.

   Students and faculty may receive assistance using these resources from the librarians in the Reference Area on the first floor of the Gray Library. Materials not available in a

full-text format online are usually available in the Library's physical collection or from another library via our Interlibrary Loan service.

4. Library Technical Collection

   Reference works are acquired to provide support for patrons and reference staff to answer frequently asked questions. With any valid patron's computer, numerous online subscriptions are available: electronic publications from ACM Digital Library, Engineering Village, IEEE Xplore, IEEE Computer Society, IMA Journal of Numerical Analysis, Information Science and Technology Abstracts, NetLibrary, Proceedings First, Proquest, Research Library (Proquest), Science and Technology Collection (Ebscohost), Science Citation Index with access to Web of Science, ISI Web of Knowledge, and CrossSearch, Science Direct, Academic Search Premier and subscription to IEEE CSDL added in 2010. Access is facilitated by the use of a library-provided proxy server that authenticates against the integrated library system patron database.

   Existing and recently purchased e-books are especially useful for learning operating systems administration, database administration, networking protocols, data mining, artificial intelligence, office productivity applications, and technologies used for handling formats and data input. With the advent of distance learning, more library materials are becoming available electronically.

5. Library Electronic Access

   The Gray Library's electronic information is available 24 hours, 7 days per week on campus, or anywhere in the world. All patrons must authenticate using campus provided ID usernames and passwords. Services are available via the Internet at http://library.lamar.edu via the campus Intranet at http://my.lamar.edu.

   Wireless access is provided on each floor of the library to accommodate patrons using their own personal computers. Each floor also has a desktop computer configured to allow patrons to do library research. In addition, there are 43 PCs in Reference area; 96 PCs on 7th floor; 139 in total. Study rooms for group study are available on the fourth, fifth, and sixth floors. The study rooms provide personal computer access via Ethernet jacks, wireless, and electrical power outlets.

   The SirsiDynix Unicorn integrated library automation system is hosted at the Gray Library's Systems Department.

   Two Sun servers named atlas.lamar.edu and codex.lamar.edu provide production and test equipment for the administration of the Sun Solaris and Oracle database platforms. This equipment is augmented by an Intel server running Windows 2003 and an Intel server running Windows 2003 R2 server. While the Sun servers run the integrated library system, the Intel servers run web servers and an email service used for utility purposes such as emailing reports to staff and notices to patrons. Email notices will be deployed in the next few months. The second Intel server is used to store Ghosted images of PC client configuration for over eighty-four PCs in the Reference lab, Library Classroom

708A, Reserves, Circulation, stack floors three, four, five, and six, Interlibrary Loan Department, and the Archives and Special Collections Department.

The Intel servers also provide Interlibrary Loan software, e-Reserves document delivery, Library web pages, Electronic Resource connections with a proxy server, Archives and Special Collections software, and an Intranet web service that is being transferred to Wiki software for more interactive service and documentation for the Department's receiving services.

The PCs use Windows Operating Systems, Microsoft Laboratory Toolkit, and Microsoft Office which includes most of the functionality provided in the *Business Enterprise* edition, Internet Explorer and Firefox, with every available plugin that is known. Printing is available using shared or networked printers at workstations. There are plans to add several circulating laptops for student use.

Services include electronic resources consisting of a long list of commercial and government documents web sites. Authentication is provided to the commercial databases with IP address range or username/passwords. A proxy service completes the remote connections to make it possible for all valid patrons to access the electronic resources from any PC.

E-Reserve is a service to classes with high demand materials. These materials are provided to the Library in electronic form from the instructor. When these materials are available to students, an email is sent to the instructor providing the authentication information. Of course, physical information sources are also available from the Reserves Department, but the online service is most popular.

The over 500,000 titles of the Gray Library are accessible with the use of an online catalog on the library website. Monographs, journals, and other media are accessible. Over 30,000 e-books are available in all disciplines of which Computer Science and related technologies make up a large portion. The e-books may be used by students to access such information as administration of technologies relating to network protocols, operating systems, office productivity applications, and many other related monographs pertinent to the study of computer science. Approximately 980 e-books were added in support of computer science during FY09-FY13.

Electronic Resources are provided by vendors who are called aggregators. Aggregators provide access to thousands of serial publications which include titles from trade and scholarly peer-reviewed journals and monographs. Below is a list of aggregators whose services are relevant to the study of Computer Science and are purchased either individually or as a member of a consortium. The Gray Library is a member of TexShare, a consortium managed by the Texas State Library and Archives Commission. As a member of the consortium, the Gray Library receives the core list of aggregators' databases. The lists of publications handled by each aggregator change occasionally, and an overlap in the contents of their services commonly occur. Also, differences exist in the quality of the content provided by vendors. A vendor whose product would be of the

highest quality would provide indexing, abstracting and full- text content as it is published. A common practice for journal publishers is to restrict an aggregator from displaying content immediately upon publication. Supposedly this embargo increases the number of individual subscriptions sold and thus the revenue of the publisher. According to the continuing negotiating powers of each aggregator, the quality of their journal title lists varies from one day to the next. The aggregator databases are used largely by the undergraduate student population, while the publisher-supplied databases, such as IEEE Explore and ACM Digital Library are more targeted resources for specific subject areas. The following is a list of publisher-supplied and aggregator databases:

- Academic Search Complete
- ACM Digital Library Core Package
- Business Source Complete l
- Computer Source
- IEEE All-Society Periodicals Package (ASPP)
- IEEE CSDL
- EBSCOHost e-books (formerly, NetLibrary)
- Professional Development Collection
- ProQuest Research Library
- Psychology & Behavioral Sciences Collection
- Science and Technology
- ScienceDirect e-journals and e-books (Elsevier)
- Student Resource Center College Edition Expanded
- WorldCat

The Mary & John Gray Library also contracts with W.T. Cox to provide an online index of the full-text journals subscriptions across all aggregators via Journal Finder. This service allows a user to enter the publication title and get a results list of aggregators that display the contents of the journals, and also serves as a link resolver that provides a direct link to the full-text article(s) that are available within a given database.

Additionally, the Gray Library subscribes to individual titles, printed or online. Those journal titles are found in the Library's online catalog. Marc records for e-journals and e-books will have a URL linked to the full-text contents. With patron validation after clicking on the link, library users have full access from any computer capable of Internet service. The journals are provided by the library's EZ-Proxy server located on an Intel server in the Systems Department of the library.

The catalog uses keyword, author, title, and subject indexes. Searches may be done on a basic or advanced mode. The basic mode may be limited to putting in a search word or phrase and accepting the default search. An advanced search uses a combination of author, title, publication date, keyword, subject, material type, and call numbers to narrow searches.

The online catalog has features that allow patrons to check their personal account on the system that shows what they have checked out, what holds they have on library materials,

if and how much their fines are, if any. Patrons are provided a generic personal identification number or word and are allowed to change it themselves once they have logged into the system. There are approximately 1000 computer-science-related journals available through the library.

Table below shows the library expenditures in support of computer science, from academic year 2009 to 2013.

Table 7-1 Library Expenditures in Support of Computer Science AY09 – AY13

Year	Books	E-books	Journals	E-journals	Notes
AY09	$1,069.00		$1,998.35	$ 9,284.69	
AY10	$ 355.07		$2,944.41	$ 9,527.59	
AY11ǂ	$ 518.92	$16,166.00	$2,204.22	$ 9,898.70	
AY12	$ 598.83		$ 859.25	$10,076.40	
AY13*	$1,988.63		$ 504.90	$11,461.69	Springer print subscriptions converted to online in 2013
ǂOne-times funds used to purchase Computer Science e-books. Averages $3,233.20 per year over 5-year period.					
*Budgeted amount for AY13 - still in progress.					

Databases	
ACM Digital Library	$5,210.00
IEEE ASPP	$42,325.00
IEEE CSDL	$8,519.00
Computer Abstracts	$4,961.00
ENGNetBase	$7,650.00
COMPENDEX	$21,850.00
Science Citation Index	$28,724.81

G. Overall Comments on Facilities

Lamar University is a public and open campus. No effort is made to restrain the general public from entering the campus; however, the University Police Department reserves the right to bar individuals who are considered a threat to the well-being of the University community.

LUPD provides 24-hour patrol of campus property and facilities, and designated building coordinators establish and maintain access to their respective buildings. The campus is routinely inspected for environmental safety hazards such as insufficient lighting and

overgrown shrubbery; however, members of the University community are encouraged to report locations of concern to University Police.

The Lamar University student resident community accommodates more than 2000 students in double occupancy suites with private bedrooms. Services and programs intended to enhance the quality of life and to ensure the security and safety of the residents are a major priority of the University. The Cardinal Village staff includes a full time Phase Director and a number of Community Assistants for each phase.

Security and safety policies and procedures, especially regarding locking individual rooms, building entrances and related precautions are discussed with residents in crime prevention seminars, in building meetings, and in printed materials which are posted and distributed. Thirty-two emergency phones have been placed at strategic locations on campus. Phones are on white posts with blue lights on top. When the red button is pushed, the location of the call is automatically identified and the caller is connected to the police department. Locations of the telephones are marked on all parking maps and safety brochures. Individuals with hearing impairments should remain at the phone until an officer arrives.

Lamar University has a notification system to reach individual students via e-mail, voice messages and/or text messaging. Incoming students should verify their primary phone number with the Records Office. New employees should verify their primary phone number with Human Resources. The University has established a Public Address System for the central campus.

The office of Student Affairs, in conjunction with Lamar University Police, offers free shuttle service from 5:30 p.m. to 12:30 a.m. daily. Students utilizing this service must have a valid student I.D. The shuttle service provides transportation for students on campus and within the immediate vicinity of the campus. Students should call 880-2241 for this service.

Inside the Maes building an evacuation plan is posted on the walls at the two main entry doors. There is an automatic fire sprinkler system, 7 fire extinguishers on the first floor and 9 on the second floor. There are fire alarms and smoke detectors on both floors. Special evacuation equipment is located beside the elevator on the second floor for disabled persons to use the stairs in case of an emergency and the elevator is not functioning.

CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

The Department Chair, Dr. Stefan Andrei, works with the Dean of College of Arts and Sciences, Dr. Brenda Nichols, and the Provost, Dr. Stephen Doblin, to bring resources to the students, staff, and faculty of the Department of Computer Science. He is assisted by:

- Senior Administrator Associate, Mrs. Denise Rode.
- Office Assistant, Mrs. Jenifar Kallul.
- Instructor and System Administrator, Mr. Qinguo (Frank) Sun.
- Technical Support Senior Analyst, Mr. Jason Foster.

The Chair leads all activities pertaining to the quality and continuity of the program, including, but not limited to:

- Maintaining and promoting high academic standards within the administration of the Department.
- Encouraging and supporting scholarship by the faculty and students.
- Maintaining departmental facilities and equipment, and administering budgets.
- Facilities Coordinator for the Maes Building.
- Overseeing and maintaining curricular standards and developing departmental schedules.
- Providing administrative leadership in personnel decisions relative to hiring, retention, promotion, tenure and merit pay.
- Faculty load (teaching, research/creative endeavors, and service) appropriate for the position.
- Supporting University and College policies.
- Other duties as required by the Department or assigned by the dean.

Dr. Bo Sun is the Undergraduate Students Advisor. His main duty is to advise freshman and sophomore students in taking the courses needed for graduation. His supplementary work is compensated by one course release per year.

Dr. Timothy Roden is the ABET/SACS assessment coordinator for the Department. Duties of this assignment include responsibility for authoring all ABET-related reports and yearly SACS reports, all of which are posted on the Department website. His supplementary work is compensated by a one-sixth salary stipend.

The Department has two permanent committees, the Assessment Committee and the Curriculum Committee.

Members of the Assessment Committee are as follows: Dr. Tim Roden (Chair), Dr. Stefan Andrei, Dr. Jiangjiang Liu, Dr. Kami Makki, and Dr. Lawrence Osborne. The task of the

Assessment Committee is to systematically gather and analyze the assessment data so that they can make recommendations to the faculty. These recommendations are discussed in faculty meetings.

Members of the Curriculum Committee are as follows: Dr. Lawrence Osborne (Chair), Dr. Stefan Andrei, Dr. Peggy Doerschuk, Dr. Hikyoo Koh, and Dr. Tim Roden. The task of the Curriculum Committee is to analyze the requests from faculty members regarding courses and to make recommendations. These recommendations are based on their experience, the 2013 Computer Science Curriculum made by Association of Computing Machinery (ACM), and the job market, and more. These recommendations are discussed in faculty meetings.

The Department of Computer Science is one of the twelve departments of the College of Arts and Sciences. Dean Nichols is strongly committed to supporting scholarly endeavors and increasing enrollment of high potential students. For example, Dean Nichols has instituted a yearly Arts and Sciences Award ceremony to recognize outstanding students. She has also helped raise scholarship funds for all departments, and encourage faculty to submit proposals for external funding. Dean Nichols is always supportive in faculty and staff travels, including the ABET workshops.

Provost Doblin has also been very supportive in numerous ways, by allowing faculty to have lower than average course loads, by giving the Department HEAF funds for renovation of space to enable faculty to have laboratories for research, supplementing our travel budget, and additional funds to pay for release funds. In addition, he has been very supportive in offering matching funds for a recent NSF-funded grant, ASCENT (described next section).

B. Program Budget and Financial Support

1. Budget Allocation Process

   The Department Budget covers faculty and staff salaries, stipends for student assistants (graders and graduate research assistants), operations and travel funds. These funds are allocated to the Department annually by the University. Our Department has 12 permanent faculty and 3 adjuncts, out of which 8 are tenured and 1 is tenure-track. Our Department has 6 staff positions interacting with students, faculty, other staff members, as well as visitors.

   The travel funds are adequate to support all the faculty domestic travel requests to conferences, but international/overseas travel requests need to have approval from the College and University administrators. Overseas travel requests should include a detailed itinerary and a justification of the conference ranking. In addition, several computer science faculty have their own research grants which allow them to use these funds for travel. In the last six years, our faculty have been awarded with more than $2.1 million from the National Science Foundation.

   Most laboratory equipment (computers, embedded systems, etc.) is acquired through HEAF money allocated by the University to each department based on need. A

justification is necessary for all equipment as well as at least three different quotes. Our Department is able to allow a replacement of instructional equipment on a three-year cycle.

The Department of Computer Science offers 3 permanent scholarships formed from donations, such as:

A. The Crawford/Lewis Scholarship in Computer Science

The Department of Computer Science at Lamar University awards the Crawford/Lewis Endowment Scholarship each spring semester to two incoming, or current students in the bachelor's program in Computer Science or Computer Information Science. The scholarship award is $1200.00, and it is awarded in two payments, half in the fall semester and half in the following spring semester. Traditionally, at least one of the scholarships has been awarded to an academically exceptional incoming freshman. The main criteria is that the scholarship recipient must be, or intend to be, a full-time student in the Bachelor's of Science degree program in Computer Science or Computer Information Science. The Crawford/Lewis scholarship is for high school graduates and the criteria include: SAT or ACT scores, rank in class, extracurricular activities at school, and community service. The Scholarship can be granted to the same student for a total of four academic years provided the student reapplies each year, maintains a GPA of at least 3.0 each semester, and is enrolled in a minimum of twelve semester hours each semester.

B. The Dr. William "Bill" Nylin Scholarship in Computer Science

The Department of Computer Science at Lamar University awards the Bill Nylin Scholarship each spring semester to an incoming, or current, student in the bachelor's program in Computer Science or Computer Information Science. The scholarship award is $1200.00, and it is awarded in two payments, half in the fall semester and half in the following spring semester. This scholarship has been awarded to an academically promising student who has earned at least 15 university semester credit hours. The main criteria is that the scholarship recipient must be, or intend to be, a full-time student in the Bachelor's of Science degree program in Computer Science or Computer Information Science at Lamar University. The Bill Nylin Scholarship can be granted to the same student for a total of three academic years provided the student reapplies each year, maintains a GPA of at least 3.0 each semester, and is enrolled in a minimum of twelve semester hours each semester. The main criteria for selection are as follows: GPA in Computer Science courses, number of credit hours, and letters of reference from faculty.

C. The Bobby Waldron Memorial Scholarship in Computer Science

This is a scholarship for students with at least 30 university semester credit hours. The preference is given for students with a GPA of more than 3.0 and who have finished the courses Programming Fundamentals I and Programming Fundamentals II.

In addition, our department offers the following two other student scholarships awarded using funds from the National Science Foundation:

A. The STAIRSTEP Program (http://dept.lamar.edu/stairstep/)

Lamar University's STAIRSTEP program (2009-2014) is designed to increase the number of students receiving baccalaureate degrees in Computer Science, Chemistry, Physics, Geology, Earth Science and Mathematics, all at Lamar University. This includes women and minorities who are underrepresented in Science and Technology, as well as low income and first generation college students.

B. The ASCENT Program (http://galaxy4.cs.lamar.edu/~ascent/ascent/)

Lamar University's National Science Foundation sponsored program, called the ASCENT program (2012-2017), provides scholarships (up to $10,000 per year) to community college students who transfer to Lamar University. Upper-level math and computer science majors already at Lamar who intend to complete a bachelor's degree are also eligible. In addition to faculty mentoring, students are supported by peer mentoring, career education, and additional summer research opportunities.

2. Teaching Support

Teaching is supported by the Department of Computer Science in at least two major ways. First, all faculty are assigned graduate students to grade homework assignments, grade projects and prepare labs. Second, the STAIRSTEP program, the Department, and the ACM Local Chapter support free tutoring for freshman and sophomore students. Tutors are senior computer science students.

In addition, Lamar University has a strong commitment to student and faculty engagement in teaching and learning excellence. Under the direction of the Provost's Office, the Center for Teaching and Learning Enhancement (CTLE) supports faculty, administrators, graduate students, and staff in their academic pursuits and provides a range of instructional services to assist all members of the Lamar University teaching community. CTLE offers assistance through the following programs: workshops and seminars, faculty learning communities, evaluation, and assessment. Furthermore, CTLE will, on request, provide feedback about individual instructor's classroom performance.

The evaluation methods involve one-on-one meetings, classroom observations, and confidential counseling.

3. Provision for Resources

The Department of Computer Science has six open labs for students, six research labs, one GPU education lab, and one Gaming lab. There exist a total of 400 units of hardware equipment including computers, projectors, and printers, in the Department inventory list. As budgeted by the University, all computers in the open lab follow a three-year rotation schedule to keep updated. Upgrades to computers in faculty research labs come from instructor research funds supplemented by University HEAF funds. Below is a partial list of the software and hardware available in Department open labs:

- Lab 214 (Windows 7 - 2 machines: Netbeans, Eclipse, PuTTY, Microsoft Office, Basic Micro Studio, MATLAB; Solaris – 10 Machines: SUN Ultra 20 and SUN Ultra 45; Macintosh – 10 Machines: Adobe Creative Suite, Eclipse, Netbeans, Microsoft Office);
- Lab 215 (Windows 8 – 24 Machines: Microsoft Office, Netbeans, Eclipse, ArgoUML, MATLAB, Notepad++, PuTTY, Scratch);
- Lab 212 (Windows 7 – 36 machines: MATLAB, Microsoft Office, Microsoft Visual Studio, Netbeans, Notepad++, Scratch, WinSCP, Microsoft Expressions);
- Lab 213 (Windows 7 – 26 machines: QTSpim, Adobe LiveCycle, Android SDK Tools, AppInventor, GameStudio A8, MATLAB, Microsoft Expression, Microsoft Office, Microsoft Visual Studio, Netbeans, Notepad++, Scratch, WinSCP, Xming);
- Lab 208 (Linux – 22 machines: 4 Apple iMac, 1 InVidia workstation with CUDA);
- Department Servers (6 each SUN Sunfire Server with Linux OS, 1 RACK SUN Storage, Tek 1000-42, 6 each Linux Server, 2 SUN Ultra workstation with Solaris OS).

In addition, the Maes Building has wireless access in all rooms and hallways.

4. Adequacy of Resources

The program has adequate resources to achieve all the student outcomes. The courses are offered at the required frequency to accommodate student needs, that is, mainly to ensure a timely graduation. We have a rotational scheme of courses offered in Spring and Fall semesters, as well as support to offer online courses. Summer courses are also offered and scheduled according to student needs.

The laboratories and computing equipment available in the Department labs and University labs are adequate to support the Computer Science program.

C. Staffing

The Department has the following staff members hired for permanent positions:

- Mrs. Denise Rode, Senior Administrator Associate,
- Mrs. Jenifar Kallul, Office Assistant,
- Mr. Qinguo (Frank) Sun, Instructor and System Administrator,
- Mr. Jason Foster, Technical Support Senior Analyst,
- Mr. Nischal Budhathoki and Mr. Tasfin Sheikh, System Administrators,
- Mr. Md Abu Shufean, WebMaster.

Mrs. Rode handles office activities and serves as the first contact for students, faculty, staff, and visitors to the Department. She also assists the Chair in scheduling and maintaining appointments, the Computer Science Department's Budget for faculty, graders, staff, the faculty's schedule, the Faculty Meetings Minutes, and all other administrative activities. She is helped by the Mrs. Kallul, who is also in charge of mail delivery and pickup, copier experience, and other administrative duties.

Mr. Sun and Mr. Foster handle all system administration, equipment compliance, licenses, and other technical problems. Mr. Nischal Budhathoki and Mr. Tasfin Sheikh assist them in monitoring the servers' activities. Mr. Md Abu Shufean maintains the Department's website (http://cs.lamar.edu) ensuring the content is updated and correct. In 2013 the University will transition all web content to a new content management system (CMS). Mr. Shufean, with direction from Dr. Roden, will work on transitioning the Department webpage into the new CMS during the summer and fall.

All new employees attend an orientation by Lamar University's Human Resources Department during the first week of their employment. In addition, the University offers training of policies, rules, regulations, and practices on a regular basis, many of these every two years. Employees are required to take these courses by their supervisors.

Within the Department, the Chair mentors the Administrative Associate. The Administrative Associate is knowledgeable in all academic activities, policies, and procedures of the Department of Computer Science, College of Arts and Sciences, and Lamar University. The Administrative Associate is the interface for the Department, students, faculty, and other staff.

The current Computer Science Staff members are exemplary employees. The Administrative Associate, the Office Assistant, the System Administrators, the Technicians, and the Webmaster form a great cooperating team in serving our students, staff, and faculty. In fact, many other departments from our building are helped by our professional staff, especially on urgent technical problems. All faculty and staff have access to necessary equipment, such as multiline telephone, facsimile machine, color and black/white printer, scanners, shredder, computers, and copiers. The students have access to the printers, computers, and scanners.

D. Faculty Hiring and Retention

1. Hiring Process for New Faculty

   When faculty positions become open, they are advertised usually in *Communications of the ACM* and other online list-servers. The Department Chair appoints a Faculty Search Committee of at least three individuals. This committee selects the best five candidates and sends the list to the Chair which will be presented during the next Faculty Meeting. All faculty with the right to vote (e.g., for tenure track positions, only tenured and tenure track faculty are eligible to vote) will rank the candidates to determine the first three candidates that will be invited for an on-campus interview. Upon their arrival in three different days, the applicants will meet each faculty member and the Dean of College of Arts and Sciences. Based on the interview performance and subsequent faculty recommendations, an offer is to the finalist. It is the policy of the University to insure equal employment opportunity to all individuals. The University will seek to insure by all lawful means at its disposal that all prohibited discriminatory conditions in employment are eliminated and that employment policies do not operate to the detriment of any person on the grounds of non-relevant criteria including, but not limited to race, color, religion, sex, national origin, age, disability, or veteran status. The Human Resources Office will handle the orientation for each faculty and staff member.

   The Department of Computer Science hired in August 2008 Dr. Kami Makki, Ph.D. of Queensland University, Australia, at the rank of Associate Professor. He was tenured in 2011. His areas of expertise are database, data mining, and wireless sensors. In addition, our department hired in August 2012 Dr. Timothy Roden, Ph.D. of University of North Texas at the rank of Assistant Professor. His area of expertise is game design and development. He was promoted to Associate Professor in 2013.

2. Faculty Retention Strategy

   New faculty members are awarded with start-up funds to support their research laboratories and teaching activities. Lamar University is very supportive in this respect. For example, one of the newest Associate Professors, Dr. Timothy Roden, was given financial support of more than $40,000 value of modern equipment for the Game Development Laboratory in 2013. The students and faculty are delighted to know we will soon add a Game Development concentration. In addition, Lamar University has a competitive internal grant program called ‘Research Enhancement Grant’ of $5,000 dollars that can be used to cover travel expenses and student assistants. Typically, new faculty have been given priority for this program.

   The typical teaching load is 9 hours per semester. A faculty who is awarded with an external grant gets a one course–release time for the duration of the grant. The College of Arts and Sciences as well as Lamar University have research, teaching, and advising awards recognizing meritorious faculty. In addition to using the grant funds, any faculty has the possibility to apply for travel funds to present their work at conferences. This is, in general, based on evaluation of each application, on a case-by-case basis.

The Department of Computer Science is proud to maintain a collegial environment. Members of our department celebrate birthdays and holidays with parties or other related activities. Faculty and staff are generally unselfish in their service to the common objectives of the Department. Within the larger domain of Lamar University, the relationship among faculty is very cordial. Interdisciplinary research and service throughout the University are common.

Another important event involving faculty is helping students organize the ACM Spring Banquet. Faculty help students to select a Distinguished Speaker for the event. In addition, the Department assists the event by co-paying the incurred expenses, such as travel, hotel accommodation, lunch and dinner, and more. The STAIRSTEP program (directed by Dr. Peggy Doerschuk) provides an honorarium of $1000 for the Distinguished Speaker. Furthermore, the Department offers various awards to many students for academic performance, including best Freshman, Senior, and Graduate Student. The Lamar University Chapter of the ACM offers awards to student participants in the South Regional ACM Programming Collegiate Contest. This collegiate social event attracts generally the vast majority of students, faculty, staff, alumni, Advisory Board Members, and guests.

Beaumont is a mid-size city (approximately 120,000 population) with a low cost of living, easy access via Interstate 10 to large metropolitan areas, such as Houston and New Orleans, a local airport and a population known for its southern hospitality, Cajun music and cooking, and diverse ethnic backgrounds.

E. **Support of Faculty Professional Development**

Lamar University has an excellent activity known as the Faculty Development Leave. Development leaves (Texas' equivalent to sabbaticals) are vehicles for professional growth and represent supported leaves of absence from normal duties for the purpose of professional improvement. To apply, an applicant must have been a faculty member for at least two consecutive academic years. A faculty member is defined as a person employed by the institution on a full-time basis whose duties include teaching, scholarship, or administration. The Faculty Senate considers only applications from teaching and library faculty, since other advisory bodies consider leave requests from administrators (including department chairs) and staff.

Faculty may apply for a summer session leave (no pay, expenses only), a semester leave (full pay), or an academic year leave (half pay). A faculty member may NOT apply for leaves under more than one of the above categories during any given year, and identical or strikingly similar project proposals will not be funded twice. Lamar University considers the following two main criteria for the Faculty Development Leave:

1. To what extent will the proposed activities improve the faculty member's teaching and/or ability to perform scholarly/research activity?

2. To what extent is a development leave necessary for the accomplishment of the proposed activities?

Lamar University provides exceptional institutional support to the Department of Computer Science. The Department enjoys generous support from the College, Provost and Administration as evidenced by the ongoing renovation of facilities, continuous upgrades to computing resources, hiring of new faculty, grants for travel and professional development and opportunities to expand the Department into new areas of expertise and curriculum development such as the recent support of an initiative to develop a concentration in computer game development.

PROGRAM CRITERIA

The program satisfies ABET criteria as discussed in Section "Criterion 3 Student Outcomes."

The eleven (11) ABET criteria for student outcomes are mapped to 4 Program Educational Objectives as shown in Table 3-1. The four (4) Program Educational Objectives map to 9 program student learning outcomes shown in Table 3-2. The nine (9) student learning outcomes are each mapped to one or more required courses in the program as shown in the Curriculum Map in Appendix H. See Section "Criterion 3 Student Outcomes" for a full description of how the program satisfies the ABET criteria.

APPENDICES

Appendix A – Course Syllabi

The following course syllabi are listed, in order:

Required
- COSC 1172 Thinking, Speaking, and Writing
- COSC 1173 Programming Lab
- COSC 1336 Programming Fundamentals I
- COSC 1337 Programming Fundamentals II
- COSC 2336 Programming Fundamentals III
- COSC 2372 Computer Organization/Assembly Language
- COSC 3302 Introduction to Computation Theory
- COSC 3304 Introduction to Algorithm Design & Analysis
- COSC 3308 Survey of Programming Languages
- COSC 3325 Computer Law/Ethics
- COSC 4172 Senior Seminar
- COSC 4302 Introduction to Operating Systems
- COSC 4310 Introduction to Computer Architecture
- CPSC 3320 Data Comm./Computer Networks
- CPSC 4340 Database Design
- CPSC 4360 Software Engineering

Common Electives
- COSC 4319 Computer Graphics
- CPSC 4315 Network Systems Administration
- CPSC 4330 Multimedia Processing
- CPSC 4370 Introduction to Artificial Intelligence

Course Number and Name

COSC 1172 Thinking, Speaking, and Writing

Semester Credit Hours/Contact Hours per week

1/1

Instructor Name

Jiangjiang Liu

Textbook, Supplemental Materials

- Required
  - Baase, S. (2007). Gift of Fire, A: Social, Legal, and Ethical Issues for Computing and the Internet. (3rd edition). Prentice Hall.
- Supplemental
  - Feynman, R. P. (2000) Feynman Lectures on Computation. Westview Press.
  - Patt, Yale and Patel, S. (2003). Introduction to Computing Systems: From bits & gates to C & beyond. McGraw-Hill.
  - Lammers, S. (2006). Programmers at Work, Interviews with 19 Programmers Who Shaped the Computer Industry. Microsoft Press.
  - Asimov, I. (2004). I, Robot. Bantam Harper Edition.
  - Davis, M. (2000). The Universal Computer, The Road from Leibniz to Turing. W. W. Norton.
  - Stoll, C. (1990). The Cuckoo's Egg: Tracking a Spy Through the Maze of Computer Espionage. Simon & Schuster.
  - Shasha, D. and Lazere, C. (1998). Out of their Minds: The Lives and Discoveries of 15 Great Computer Scientists. Springer-Verlag.
  - Brooks F. P. (1995). The Mythical Man-Month: Essays on Software Engineering. Addison-Wesley.
  - Tracy, K. (1981). The Soul of a New Machine. Little, Brown, and Company.

Catalog Description

The objective of this course is to give students experiences that convey the five main activities of a person working in the area of computer science: reading, listening, thinking, speaking, writing and cooperative interaction.

Prerequisites or Co-requisites

Co-requisite: COSC 1173 and COSC 1336.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Think critically about ideas in the computer science field.
- Describe some of the issues related to the societal impact of information technology and the ethics of computer professionals.
- Discover and investigate relevant information in order to gain knowledge and solve problems.

- Generate his/her own ideas and express them effectively.
- Deliver a point of view and develop it with awareness of alternatives.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - Outcome 4, 5.3, 5.4, 5.5, 6, 7, 8
- Reinforce
  - None
- Summative
  - None

List of Topics Covered

- Procedures and student policies for the computer science program at Lamar.
- What is computer science?
- Writing skills.
- Critiques of professional papers.
- Current economic, social and ethical issues in computer science.
- How to present a paper in computer science.
- Working in teams.
- Presentations and final projects by students.

Course Number and Name

COSC 1173 Programming Lab

Semester Credit Hours/Contact Hours per week

1/1

Instructor Name

Sujing Wang

Textbook, Supplemental Materials

- Required
  - Liang, Y. D. (2013). Introduction to JAVA Programming. (Comprehensive Version, 9th edition). Pearson Education.

Catalog Description

Practical applications of concepts learned in Computer Science 1373 (COSC 1373). Hands-on instruction in programming in an object-oriented language, developing, debugging, and testing programming projects.

Prerequisites or Co-requisites

Co-requisite: COSC 1172 and COSC 1336.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Develop correct and efficient programs to implement software.
- Debug implemented software in a proficient manner.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - None
- Summative
  - None

List of Topics Covered

- Introduction to Computers, Programs, and Java.
- Elementary Programming.
- Selections.
- Loops.
- Methods.
- Single Dimensional Arrays.
- Multidimensional Arrays.

Course Number and Name

COSC 1336 Programming Fundamentals I

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Timothy Roden

Textbook, Supplemental Materials

- Required
  - Liang, Y. D. (2013). Introduction to Java Programming. (Comprehensive Version, 9th Edition). Prentice Hall.

Catalog Description

Introduces the fundamental concepts of object oriented programming. Topics include objects, class, polymorphism, exception handling, inheritance and interfaces. This course assumes computer literacy.

Prerequisites or Co-requisites

Co-requisite: COSC 1172 and COSC 1173.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Apply UML interaction diagrams and class diagrams to illustrate object models.
- Develop correct and efficient programs.
- Debug implemented software in a proficient manner.
- Develop user-level documentation for software.
- Fundamental programming techniques: data, expressions, branching, and loops.
- Fundamental data structures: primitive types, arrays, and strings.
- Basic Object-Oriented-Programming (OOP) techniques: classes, objects, and methods.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - 1.1,1.4,1.5,1.6,1.7
- Reinforce
  - None
- Summative
  - None

List of Topics Covered

- Introduction to Computers, Programs, and Java.
- Elementary Programming.
- Selections.
- Loops.

- Methods.
- Single Dimensional Arrays.
- Multidimensional Arrays.
- Objects and Classes.
- Strings.
- Thinking in Objects.

Course Number and Name

COSC 1337 Programming Fundamentals II

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Kami Makki

Textbook, Supplemental Materials

- Supplemental
  - Liang, Y. D. (2013) Introduction to Java Programming. (Comprehensive Version, 9th edition). Prentice Hall.
  - Lewis, J. and DePaquale P. (2012). Java Foundations: Introduction to Program Design and Data Structures. Addison-Wesley.
  - Gillay, C. (2003). Linux User's Guide Using the Command line and Gnome with Red Hat Linux. Franklin Beedle & Associates.

Catalog Description

Explores in depth the topics covered in COSC 1336.

Prerequisites or Co-requisites

Prerequisite: COSC 1336 with grade of "B" or better.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Create useful software architecture documentation.
- Develop correct and efficient programs to implement software, and demonstrate a basic understanding of the concept of algorithm analysis.
- Debug implemented software in a proficient manner.
- Demonstrate familiarity with all primitive types in the language of choice, all commonly used control structures, simple user defined constructs such as enumerated types, low level programming tasks such as I/O, string manipulation, and array processing up to two dimensions.
- Describe standard simple sorting algorithms such as the bubble sort, insertion sort, and selection sort.
- Demonstrate familiarity with standard linear and binary search algorithms, as well as the simplest, array-based, linear data structures (stacks and queues).
- Make appropriate choices in data, methods, style, structure, and information hiding while designing and constructing Object Oriented Programs.
- Demonstrate basic understanding of the Linux/Unix operating system.
- Demonstrate basic understanding of more advanced language features such as recursion, polymorphism, exception handling, file I/O, UML, and inheritance.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - 1.7
- Reinforce
  - 1.1, 1.4, 1.5, 1.6
- Summative
  - None

List of Topics Covered

- JAVA Topics
  - Reviews topics from COSC 1336 (Classes & Objects, Single & Multidimensional Arrays).
  - Inheritance and Exception Handling.
  - Introduction to Polymorphism.
  - Brief Introduction to Algorithm Analysis.
  - String processing using basic string methods provided by Java.
  - File I/O using text files.
  - Searching (Linear search, Binary search).
  - Sorting (Insertion sort, Selection sort, Quick sort, Bubble sort).
  - Debugging techniques.
  - Linear Data Structures (Stack & Queue & Circular Queue).
  - Recursion (Direct, Indirect, Alternatives to recursion).
- UNIX Topics
  - An overview of UNIX System.
  - Logging in/out, simple commands; intro to the UNIX directory structure.
  - UNIX editor (vi), editor command and text input modes; memory buffer; exit (w or w/o saving).
  - More UNIX commands; script, ls, cd, cp, mv, rm, cat, more, lpr, mkdir, etc.
  - Using buffers in vi editor; cut and paste; moving around in vi.
  - I/O redirection; pipes; simple filters (grep and sort); filename substitution.
  - Find command; head, tail, wc, echo, make, tar, ar, shell and environment variables.
  - Simple shell programming, profile, alias, protection modes using chmod.
  - Command line parameters argc, argv, exit.

Course Number and Name

COSC 2336 Programming Fundamentals III

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Stefan Andrei

Textbook, Supplemental Materials

- Required
  - Liang, Y. D. (2013). Introduction to Java Programming, (Comprehensive Version 9th Edition). Prentice Hall.
  -

Catalog Description

Further applications of programming techniques, introducing the fundamental concepts of data structures and algorithms. Topics include recursion, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), and algorithmic analysis.

Prerequisites or Co-requisites

Prerequisite: COSC 1337 with grade of "B" or better and MATH 2413 and MATH 2305.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Create useful software architecture documentation at the program, class, method, and block levels.
- Develop correct and efficient programs to implement software.
- Debug implemented software in a proficient manner.
- Demonstrate familiarity with searching and sorting algorithms for (non-)linear structures.
- Define and distinguish among frequently used discrete structures such as lists, trees, and graphs to computer science problems.
- Use elementary concepts of combinatorics, probability, and statistics to analyze and evaluate the efficiency of algorithms.
- Demonstrate basic understanding of time complexity.
- Design efficient algorithms and compare competing designs.
- Demonstrate basic understanding of some design approaches such as greedy algorithms, dynamic programming and divide-and-conquer.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - 1.3, 2.1.3, 2.2, 3
- Reinforce
  - 1.1, 1.4, 1.5
- Summative
  - 1.7, 2.1.1

List of Topics Covered

- Recursion.
- Generics.
- Lists, stacks, queues, and priority queues.
- Sets and maps.
- Developing efficient algorithms.
- Sorting.
- Implementing lists, stacks, queues and priority queues.
- Binary search trees.
- Hashing.
- Perfectly balanced (AVL) trees.
- Graphs and applications.
- Weighted graphs and applications.
- Multithreading and parallel programming.

Course Number and Name

COSC 2372 Computer Organization/Assembly Language

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Sujing Wang

Textbook, Supplemental Materials

None.

Catalog Description

Basic computer architecture and assembly language programming. System software, including loaders and assemblers. Input-output devices and programming.

Prerequisites or Co-requisites

None.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Convert integers to and from other number bases than 10, primarily base 2 and base 16.
- Demonstrate knowledge of hardware implementation of integers and basic arithmetic operations.
- Demonstrate knowledge of the two's complement integer representation scheme.
- Demonstrate general knowledge of floating point implementation schemes and the primary characteristics of the IEEE 754 standard.
- Demonstrate knowledge of how fundamental, high level language features such as strings, arrays, pointers, parameter passing mechanisms, functions return value mechanisms, and call-return are implemented in assembly language.
- Program in a modern assembly language such as MIPS.
- Identify RISC architectural characteristics, and have a basic understanding of pipelined architectural design and implementation.
- Use concepts of discrete mathematics such as Boolean algebra to explain the design of computer logic.
- Use Karnaugh Maps to simplify the design of combinational and sequential circuits.
- Design simple combinational and sequential circuits using basic gates and flip-flops.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - 2.7.1, 2.7.3
- Reinforce
  - 1.5, 1.7, 2.1.3
- Summative
  - None

List of Topics Covered
• Number systems. • Hardware representation of numeric data. • Assembly language programming. • Representing data using assembly language. • Computer architectures. • Boolean algebra. • Logic design.

Course Number and Name

COSC 3302 Introduction to Computation Theory

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Hikyoo Koh

Textbook, Supplemental Materials

- Required
  - Martin, J. C. (2011). Introduction to Languages and the Theory of Computation (4th Edition). McGraw Hill
- Supplemental
  - Hein, J. L. (1996). Theory of Computation: An Introduction. Jones and Bartlett Publishers
  - Davis, M. D. (1994). Computability, Complexity, and Languages (2nd edition). Academic Press, 1994.

Catalog Description

Preliminary review/introduction of the mathematics and logic for the course. Programs and computable functions, primitive recursive functions, the universal program, Turing machines and regular languages.

Prerequisites or Co-requisites

Prerequisite: COSC 1337, MATH 2414 and MATH 2318.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Acquire clear understanding of foundation and principles of computer science such as (a) what computers can do, (b) what computers cannot do, (c) relationships and equivalences among different types of grammars, languages and accepting machines, (d) limits of algorithmic computation, and (e) differences and equivalences between determinisms and non-determinisms in various computing models.
- Acquire clear understanding of regular grammars, regular languages and finite-state acceptors.
- Acquire clear understanding of context-free grammars, context-free languages, and non-deterministic push-down acceptors.
- Acquire clear understanding of phrase-structured grammars, recursively enumerable languages and Turing machines.
- Acquire basic understanding of computational complexity pertinent to different levels of difficulties in solving computer-related problems.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.7, 2.1.3
- Summative
  - 2.3.1, 2.3.2, 2.3.3, 2.3.5

List of Topics Covered

- Unit-1: Logic and Finite Automata and Regular Expressions.
  - Binary Relations.
    Properties of Binary Relations: Reflexive, Symmetric, Transitive.
    Equivalence Relations: Equivalence Classes, Partitions.
  - Formal Logic.
    Propositional Logic and Normal Forms.
    Predicate Calculus.
  - Regular Languages and Finite State Automata Equivalence.
    Regular Languages, Regular Expressions, Deterministic FA, Nondeterministic FA.
    Closure Properties.
    Pumping Lemma.
- Unit-2: Context-Free Languages and Pushdown Automata.
  - Context-free Languages.
    Derivation Trees and Ambiguity.
    Normal forms.
  - Non-deterministic Pushdown Automata.
    Deterministic Pushdown Automata (Special cases).
    Pumping lemma.
    Closure properties and Decisions Problems.
    Parsing Techniques.
- Unit-3: Non-Context-Free Languages and Undecidable Problems.
  - Programs and Computable Functions.
    Simple Programming Language.
    Partially computable functions.
    Total functions.
    Computable functions and Primitive Recursive functions.
    Universal Functions.
    Macros.
  - Turing Machines.
    Quadruples and Quintuples.
    Universal Turing Programs.
    TM Halting Problems and Problem Reduction.
    Undecidable Problems, Limits of Computing.
    Nondeterministic TM.

Course Number and Name

COSC 3304 Introduction to Algorithm Design & Analysis

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Quoc-Nam Tran

Textbook, Supplemental Materials

- Required
  - McConnell, J. (2008). Analysis of Algorithms: An Active Learning Approach. (2nd edition). Jones & Bartlett.
- Supplemental
  - Cormen, T. et al. (2009). Introduction to Algorithms. (3rd edition.). McGraw-Hill.

Catalog Description

The course is intended as an intermediate course to the design and analysis of algorithms for some of the most frequently encountered combinatorial problems. The course aims to provide familiarity with general algorithmic techniques, performance measures, analysis tools, and problem areas. In this course, we will focus on developing an understanding of the algorithmic design process: how to identify the algorithmic needs of an application and apply algorithmic design techniques to solve those problems. Students will also learn how to identify problems for which no exact, efficient algorithm is known.

Prerequisites or Co-requisites

Prerequisite: COSC 2336

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Design efficient algorithms and compare competing designs based on their complexities.
- Be familiar with mathematical and scientific principles relevant to computer science.
- Explain the mathematical concepts used in describing the complexity of an algorithm.
- Select and apply algorithms appropriate to a particular situation.
- Demonstrate basic understanding of some design approaches such as greedy algorithms, dynamic programming and divide-and-conquer.
- Employ one from a range of strategies leading to the design of algorithms to serve particular purposes.
- Explain the trade-offs that exist between a range of algorithms that possess the same functionality.
- Be familiar with advanced and modern topics in computer science.
- Be able to debug implemented software in a proficient manner.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None

- Reinforce
  - 1.3, 1.7
- Summative
  - 1.4, 1.5, 2.1.2, 2.2

List of Topics Covered

- Analysis basics.
  - Big Oh, big Omega, and big Theta notations.
  - Recurrence relations and their solution.
  - Rates of growth: worst, average and amortized analysis.
  - Analysis as a Design Tool.
- Designs and analysis of divide-and-conquer algorithms.
  - Analyzing recursive algorithms.
  - Recurrence relations.
  - Closest pair.
  - Convex hull.
- Designs and analysis of searching and sorting algorithms.
  - Optimal searching and sorting algorithms.
  - Priority Ques and Heaps, Heapsort.
  - Quicksort.
  - Sorting in Linear Time.
- Designs and analysis of graph algorithms.
  - Depth-first traversal algorithms.
  - Breadth-first traversal algorithms.
  - Minimum spanning tree.
  - Shortest path algorithms.
- Advanced designing techniques: Dynamic Programming and Greedy Algorithms.
  - Traveling salesperson approximation/matrix chain.
  - Fibonacci numbers and binomial coefficients.
  - All-pair shortest path algorithm.
- Designs and analysis of parallel multi-core algorithms.
  - PRAM model.
  - Simple parallel operations.
  - Matrix multiplication, Gaussian elimination.
  - Parallel searching.
  - Parallel sorting.

Course Number and Name

COSC 3308 Survey of Programming Languages

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Stefan Andrei

Textbook, Supplemental Materials

- Required
  - Roy, P. V. and Haridi, S. (2004).: Concepts, Techniques, and Models of Computer Programming. MIT Press.
- Supplemental
  - Tucker, A. and Noonan, R. (2002). Programming Languages. Principles and Paradigms, McGraw Hill.

Catalog Description

The organization of programming languages, especially run-time behavior of programs; the formal study of programming language specification and analysis, and the continued development of problem solution and programming skills.

Prerequisites or Co-requisites

Prerequisite: COSC 2336.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Demonstrate basic understanding and appreciation of the various essential programming-languages constructs, programming paradigms, evaluation criteria, and language implementation issues.
- Demonstrate basic knowledge and skills in programming languages concepts and corresponding programming techniques with the focus on concepts and not on a particular language.
- Apply simulation and experimentation of programming techniques in terms of simple (visual) abstract machine.
- Demonstrate knowledge of limitations of computational capability of computer grammars.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.2, 1.7, 2.3.3, 2.3.5
- Summative
  - 2.3.6, 2.3.7

List of Topics Covered
• Declarative computation model. • Declarative programming techniques. • Declarative concurrency. • Message-passing concurrency. • Explicit state. • Object-oriented programming. • Relational programming. • Constraints programming.

Course Number and Name

COSC 3325 Computer Law/Ethics

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Stefan Andrei

Textbook, Supplemental Materials

- Required
  - Baase, S. (2012). A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet. (4th edition). Prentice Hall.
- Supplemental
  - Zobel, J. (1997). Writing for Computer Science, Springer.
  - Reynolds, G. (2011). Ethics in Information Technology. (4th edition). Cengage Learning.

Catalog Description

Ethical considerations for computer educators and computer scientists, and computer-related security and privacy issues. Copyright, patent, trademark and trade secret issues, venture capitalists, tax issues, computer torts, deceptive trade practices, computer crime, contract issues, constitutional issues and international trade considerations.

Prerequisites or Co-requisites

Prerequisite: COSC 1336 or COSC 1371 or another programming course.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Think critically and ethically about computer science field.
- Discover and investigate relevant lawful information in order to gain knowledge and solve problems.
- Analyze information and ideas using appropriate methods; to ethically generate his/her own ideas and express them effectively orally and in writing.
- Deliver an ethical point of view and develop it with awareness of alternatives.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.7, 8
- Summative
  - 4, 5, 7, 9.1

List of Topics Covered
• An introduction to the ethical style of good writing in computer science. • The social, legal, philosophical, and economic issues related to computers that members of a technological society might face in their professional and civic lives. • The copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods. • The proper etiquette and knowledge of acceptable use policies when using networks, especially resources on the Internet and Intranet. • The measures, such as passwords or virus detection/prevention, to protect computer systems and databases from unauthorized use and tampering; • The impact of computer programming on the World Wide Web (WWW) community.

Course Number and Name

COSC 4172 Senior Seminar

Semester Credit Hours/Contact Hours per week

1/1

Instructor Name

Lawrence Osborne

Textbook, Supplemental Materials

- Required
  - Hoffman, R. and Canocha, R. (2012). The Start-up of You: Adapt to the Future, Invest in Yourself, and Transform Your Career. Crown Business Publishing.

Catalog Description

Students take exam to measure performance against other seniors in a national standardized exam. In addition, they complete an EXIT survey, discuss job opportunities, the computer industry, and career management.

Prerequisites or Co-requisites

None.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Start a job search for a permanent position in computer science.
- Assess their most marketable skills and strengths.
- Develop a resume.
- Speak about themselves in an interesting and informative way.
- Work with recruiters.
- Target and contact potential employers.
- Describe the advantages of graduate school.
- Develop a plan for Lifelong Learning.
- Design a computer solution for an unfamiliar problem.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.7, 8
- Summative
  - 7, 9

List of Topics Covered

Varies by semester

Course Number and Name

COSC 4302 Introduction to Operating Systems

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Bo Sun

Textbook, Supplemental Materials

- Required
  - Nutt, G. (2003). Operating Systems. (3rd edition). Addison Wesley.
  - Robbins, K. A. and Robbins, S. (2003). Unix System Programming. Prentice Hall.

Catalog Description

To introduce the major concept areas of operating systems principles, develop an understanding of the organization and architecture of computer systems at the register-transfer and programming levels of system description and the inter-relationships between the operating system and the architecture of computer systems.

Prerequisites or Co-requisites

Prerequisite: COSC 2371.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Master fundamental concepts of operating systems, such as device management, process management, memory management, and file management.
- Understand device drivers and I/O management, such as polling and Interrupt-driven I/O operations.
- Understand process management, such as abstract machines, address space, context switch, process, thread, state transition diagram, and resource models.
- Understand memory management such as virtual memory, segmentation, paging, and swapping.
- Understand file management, such as basic read and write file operations.
- Understand CPU scheduling, such as design and implementation of scheduler, preemptive scheduling policies, and non-preemptive scheduling policies.
- Understand basic and high-level synchronization principles, such as critical section, deadlock, binary semaphore, general semaphore, Bounded-Buffer Problem, Dining Philosopher Problem, monitor, conditional variable, signals, and basic Inter-Process Communication.
- Develop corresponding programs using Unix system calls and program with the Unix/Linux operating system, such as fork(), signal(), pthread_create(), fopen(), sleep(), sem_init(), and wait().
- Analyze software development problems, design and implement software solutions, and write technical reports. There will be a term project, in which a complex problem will be analyzed, designed, implemented, and documented.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.3, 1.7, 6
- Summative
  - 2.4, 8

List of Topics Covered

- The design and implementation of operating systems.
- Analyze and design a software solution.
- Implement a software design specification using C language.

Course Number and Name

COSC 4310 Introduction to Computer Architecture

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Jiangjiang Liu

Textbook, Supplemental Materials

- Required
  - Patterson, D. A., and Hennessy, J. L. (2011). Computer Organization & Design: The Hardware/Software Interface. (4th edition). Morgan Kaufmann Series.
- Supplemental
  - Patterson, D. A., and Hennessy. (2006.) Computer Architecture: A Quantitative Approach. (4th edition). Morgan Kaufmann Series.

Catalog Description

This course is an introduction to computer architecture, with a special focus on the principles behind contemporary uniprocessor design. It will explore the interaction of hardware and software, and consider the efficient use of hardware to achieve high performance. Topics will include instruction set architecture, computer arithmetic, processor design, performance measurement and analysis, pipelining, caches and virtual memory, high performance MIPS implementation, parallel processors, and design tradeoffs among cost, performance and complexity.

Prerequisites or Co-requisites

Prerequisite: ELEN 2300 or equivalent.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Explain abstractions: Applications software, systems software, assembly Language, Machine Language, etc.
- Understand modern ISA design principles and employ them to evaluate systems.
- Design instruction set architecture and explain the principles using MIPS instruction set as a real system example.
- Know the arithmetic of a modern processor, such as sign and unsigned numbers, addition, subtraction, floating point, and so on.
- Demonstrate knowledge of hardware implementation of numbers and arithmetic operations.
- Evaluate performance for different computer architectures by using execution time and MIPS.
- Describe how the instructions are executed and different datapath and control implementation schemes.
- Explain how the performance can be improved with pipelining and the major concerns about pipeline design.
- Know the design of memory system hierarchies, how virtual memory works, and how to measure and improve memory system performance.

- Use simulations to analyze computer architectures.
- Justify why selected simulation methods were chosen and to state intended outcomes of the study.
- Identify steps used in simulations.
- Outline and explain the key features of simulation approaches.
- Analyze and interpret collected experiment data and draw appropriate conclusions.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.7
- Summative
  - 2.7, 3

List of Topics Covered

- Computer abstractions and technology.
- Cost and performance analysis.
- Instruction set architecture.
- Computer arithmetic.
- Datapath and controller design.
- Pipelining.
- Memory systems.
- Input-output systems.
- Interrupts and exceptions.

Course Number and Name

CPSC 3320 Data Comm./Computer Networks

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Bo Sun

Textbook, Supplemental Materials

- Required
  - Comer, D. E. (2008). Computer Networks and Internets. (5th edition). Prentice Hall.

Catalog Description

Fall and Spring of every year

Prerequisites or Co-requisites

Prerequisite: COSC 2336, MATH 2413.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Master fundamental concepts of computer networks and their applications - OSI layers, Telnet, Secure Shell, and WWW.
- Understand Socket Programming and Develop Basic Network Protocol Software and Algorithms, such as socket(), bind(), listen(), accept(), send(), and recv().
- Understand Network Layers – Physical layer, Data Link Layer, Network Layer, Transport Layer, and Application Layer.
- Understand Fundamentals of Data Transmission.
- Understand Local Area Networks (LANs) and data link protocols – Carried Sense Multiple Access / Collision Detection, 802.3, Spanning Tree Algorithm.
- Understand Internetworking, IP, TCP and UDP – Packet Format, IP Address, IP Packet Forwarding, IP Encapsulation, Fragmentation, and Reassembly, CIDR, Port, TCP Flow Control, and TCP Congestion Control.
- Understand Routing – Distance Vector Routing, Link State Routing, RIP, OSPF, and BGP.
- Understand Client-Server Interaction.
- Understand High-level network services: DNS, FTP, HTTP, SMNP.
- Understand the basic concepts of Network Security, Secret Key, Public/Private Key, and Hash.
- Perform Simulation of Network Protocols – Metric to evaluate protocol performance, and simulation of networking protocols.
- Understand Ethical Issues of Computer Networks – hacking and computer crimes, identity theft, Anonymity, Intellectual Property, Censorship, and related laws, and related cases.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None

- Reinforce
    - 1.3, 1.4, 1.6, 1.7, 2.4.4, 4.2, 4.3, 5.3
- Summative
    - 2.6, 3

List of Topics Covered

- Fundamental networking concepts and their applications.
- Data transmission and wiring.
- Network technologies.
- Internetworking protocols.
- Application software.
- Socket programming.
- Software implementation of relevant protocols and algorithms.
- Software protocol stacks.
- Ethical issues of computer networks.

Course Number and Name

CPSC 4340 Database Design

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Kami Makki

Textbook, Supplemental Materials

- Required
  - Elmasri, E., and Navathe, S. B. (2011). Fundamentals of Database Systems. (6th edition). Addison Wesley.
- Supplemental
  - Shah, N. (2004). Database Systems Using Oracle. (2nd edition). Prentice Hall.
  - Ricardo, C. (2012). Databases Illuminated. (2nd edition). Jones & Bartlett Publishing.

Catalog Description

Logical and physical database system organization; logical models; design issues; secondary storage considerations. Design issues emphasizing the normal decomposition theory of the n-ary relational data model, the RM/T model and an introduction to logical implementations of databases.

Prerequisites or Co-requisites

Prerequisite: COSC 3304, COSC 2336 and MATH 2318.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Design and implement a working database system for a real-world project.
- Write data manipulation statements in SQL to query and maintain a database.
- Use mathematical and theoretical underpinnings of database systems.
- Determine and handle the major operational issues associated with database management systems such as issues related to database design and queries.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.7
- Summative
  - 1.3, 2.5, 6

List of Topics Covered

- Architecture of database systems.
- Logical and physical database system organization.

- Relational models.
- Entity-relationship models.
- Secondary storage.
- Fundamental knowledge required to design and manipulation database.
- Security issues.
- Design issues emphasizing the normal forms and decomposition theories.

Course Number and Name

CPSC 4360 Software Engineering

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Stefan Andrei

Textbook, Supplemental Materials

- Required
  - Priestly, M. (2004.: Practical Object-Oriented Design with UML, McGraw Hill.
- Supplemental
  - Wadhwa, B., Andrei, S. and Jien, S. Y. (2007). Software Engineering: An Object-Oriented Approach. McGraw Hill.
  - Sommerville, I. (2011). Software Engineering (9th edition). Addison Wesley.
  - Larman, C. (2011). Applying UML and Patterns. Prentice Hall.
  - Binder, R. (2000). Testing Object-Oriented Systems, Addison Wesley.

Catalog Description

Systems analysis, software requirements analysis and definition, specification techniques, software design methodologies, performance measurement, validation and verification and quality assurance techniques.

Prerequisites or Co-requisites

Prerequisite: COSC 2336.

Required, Elective or Selected Elective (as per Table 5-1)

Required

Outcomes

Students will be able to:

- Analyze and design medium and large software projects.
- Implement the project in Java (or C++) programming language.
- Test the project using various methods.

Student Outcomes from Criterion 3 covered by this Course

- Introductory
  - None
- Reinforce
  - 1.3, 2.5.2
- Summative
  - 1.1, 1.2, 1.6, 1.7, 4.4, 5.2, 6, 8

List of Topics Covered

- Introduction to Software Engineering.
- Software Development Models.
- Use Case and Domain Modeling.

- Object-Oriented Analysis.
- Design (class and object diagrams, class generalization and association classes, interaction diagrams).
- State Diagrams.
- Design Patterns.
- Design to Implementation and Essentials of Java Programming Language.
- Software Testing and Automated Test Driver; Test Case Design.
- Professional Ethics, Responsibilities, and Social Implications of Software Engineering.

Course Number and Name
COSC 4319 Computer Graphics
Semester Credit Hours/Contact Hours per week
3/3
Instructor Name
Timothy Roden
Textbook, Supplemental Materials
None
Catalog Description
Basic principles for the design, use and understanding of graphics systems. Design and implementation of graphics software packages, applications and algorithms for creating and manipulating graphic displays.
Prerequisites or Co-requisites
Prerequisite: COSC 2336, MATH 2318 and MATH 2414.
Required, Elective or Selected Elective (as per Table 5-1)
Elective
Outcomes
Students will be able to: o Demonstrate an understanding of contemporary graphics hardware and software. o Create interactive graphics applications in C++ using one or more graphics applications programming interfaces. o Write programs that demonstrate 3D geometrical transformations. o Understanding the use of object hierarchy in graphics applications. o Write program functions to implement visibility detection. o Demonstrate authoring and importing of 3D models into a graphics application.
Student Outcomes from Criterion 3 covered by this Course
None
List of Topics Covered
• 3D modeling software. • Basic raster graphics algorithms for drawing 2D primitives. • Graphics hardware. • Geometric transformations. • Viewing in 3D. • Object hierarchy. • Interactive input techniques. • Visible-surface determination. • Animation.

Course Number and Name

CPSC 4315 Network Systems Administration

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Frank Sun

Textbook, Supplemental Materials

- Required
  - Nemeth, E., Snyder, G., and Hein, T. R. (2011). Linux Administration Handbook. (2nd edition). Prentice Hall.

Catalog Description

Topics include system security, shell programming, setting up user accounts, system configuration, system startup, management of file systems and disks, and backup and restore operations.

Prerequisites or Co-requisites

Prerequisite: COSC 2336.

Required, Elective or Selected Elective (as per Table 5-1)

Elective

Outcomes

Students will be able to:

- Understand a Linux/Unix system and environment, such as all the basic commands, grub, user environment, system reboot and shut down.
- Install and configure systems, such as the configuration of periodical processes, inetd, sudo, syslog, network file system, network information system, and email.
- Monitor and control processes.
- Add and delete users.
- Understand system internals – File systems, kernels, device and device drivers, daemons, etc.
- Understand networking – routing, TCP/IP etc.
- Maintain networking services – DNS, NFS, NIS, Email, WWW.
- Learn basics of security protocols, such as Secure Shell, Pluggable Authentication Module, IPtable, and intrusion detection systems (snort).

Student Outcomes from Criterion 3 covered by this Course

None

List of Topics Covered

- Unix shells
- Shell commands
- Processes and threads
- Services
- Security
- Software installation

Course Number and Name

CPSC 4330 Multimedia Processing

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Jiangjiang Liu

Textbook, Supplemental Materials

- Required
  - Sayood, K. (2005). Introduction to Data Compression. (3rd edition). Morgan Kaufmann Series.
- Supplemental
  - Gonzalez, R. C., Woods R. E., and, Eddins S. L. (2004). Digital Image Processing Using MATLAB, Prentice Hall.

Catalog Description

Television style viewing and sound interfacing to computer systems. Software and architectural interconnection requirements of digital interactive video and audio technology, graphical user interface. Definition, examples, application, review of major implementations, and architecture of hypertext systems. Voice technology: synthesis, recognition and response. Student projects.

Prerequisites or Co-requisites

Prerequisite: COSC 2336.

Required, Elective or Selected Elective (as per Table 5-1)

Elective

Outcomes

Students will be able to:

- Explain lossless vs. lossy compression and simple lossless encoding.
- Understand information theory and analyze information content of source data using entropy.
- Demonstrate an understanding of image compression preliminaries: basis functions and image transforms from an intuitive point of view.
- Describe various image compression approaches and implement compression techniques.
- Demonstrate effective use of typical compression techniques for multimedia.

Student Outcomes from Criterion 3 covered by this Course

None

List of Topics Covered

- Lossless vs. lossy compression.
- Simple lossless encoding: Huffman coding and LZW coding.
- Basic information theory.
- Lossless coding methods.
- Image compression preliminaries.
- Properties of color, gray scale, and visual perception.
- Wavelet image compression, etc.

Course Number and Name

CPSC 4370 Introduction to Artificial Intelligence

Semester Credit Hours/Contact Hours per week

3/3

Instructor Name

Peggy Doerschuk

Textbook, Supplemental Materials

- Required
  - Russell, S. and Norvig P. (2010). Artificial Intelligence A Modern Approach. (3rd edition). Pearson Education.

Catalog Description

Introduction to concepts and ideas in artificial intelligence. Topics include search techniques, knowledge representation, control strategies and advanced problem-solving architecture.

Prerequisites or Co-requisites

Prerequisite: COSC 2336.

Required, Elective or Selected Elective (as per Table 5-1)

Elective

Outcomes

Students will be able to:

- Demonstrate knowledge and understanding of fundamentals of AI, including intelligent agents, problem solving, searching, game playing, reasoning, planning, learning and robotics.
- Demonstrate knowledge and understanding of how AI techniques are used in various areas.
- Apply AI techniques in an area of interest.
- Write a brief technical report and make a brief technical presentation.

Student Outcomes from Criterion 3 covered by this Course

None

List of Topics Covered

- Introduction to AI and intelligent agents.
- Solving problems by searching.
- Introduction to the KIII.
- Local search algorithms and optimization problems, online search agents.
- Adversarial search used in games.
- Robotics.
- Learning.
- Constraint satisfaction problems.
- Logical agents.
- First-Order logic.
- Inference in First-Order logic.
- Planning.

Appendix B – Faculty Vitae

The following faculty vitae are listed, in order:

- Stefan Andrei
- Peggy Doerschuk
- Hikyoo Koh
- Jiangjiang Liu
- Kami Makki
- Lawrence Osborne
- Timothy Roden
- Bo Sun
- Quoc-Nam Tran
- Sujing Wang

Name

Stefan Andrei, Associate Professor & Department Chair, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	Hamburg University, Germany	2000
M.S.	Computer Science	"A1.I.Cuza" University of Iasi, Romania	1995
B.Sc.	Computer Science	"A1.I.Cuza" University of Iasi, Romania	1994

Academic Experience

- Associate Professor & Department Chair, Computer Science Department, Lamar University, 2013-present.
- Associate Professor, Department of Computer Science, Lamar University, 2010-present.
- Assistant Professor, Department of Computer Science, Lamar University, 2007-2010.
- Visiting Fellow, School of Computing, National University of Singapore, 2005-2007.
- Research Fellow, Singapore-MIT Alliance, School of Computing, National University of Singapore, 2002-2005.
- Assistant Professor, Computer Science, "A1.I.Cuza" University of Iasi, Romania, 2000-2002.
- Student Research Assistant, Fachbereich Informatik, Hamburg University, Germany, 1997-2000.
- Lecturer, Computer Science, "A1.I.Cuza" University of Iasi, Romania, 1996-2000.
- High School Teacher in Computer Science, Electrical High School, Iasi, Romania, 1994-1996.

Non-academic Experience

- System Network Administrator, Computer Science, "A1.I.Cuza" University of Iasi, Romania, 1992-1993.

Current Membership in Professional Organizations

- Association of Computing Machinery (ACM).
- Institute of Electrical and Electronics Engineers (IEEE).

Honors and Awards

- ACM Senior Member, April 2013.
- CS Program Fellowship, National University of Singapore, Singapore-MIT Alliance, July 2002-2005.
- World Bank Joint Japan Graduate Scholarship Program, Hamburg University, Fachbereich Informatik, Germany, September 1998 - August 2000.
- TEMPUS S_JEP 11168-96 Fellowship, Hamburg University, Fachbereich Informatik, Germany, May 1998 – June 1998.
- DAAD Scholarship, Hamburg University, Fachbereich Informatik, Germany, May 1997 – July 1997.

Service Activities

- Member of the Program Committee for more than 40 prestigious international conferences.
- Reviewer for more than 20 prestigious journals and conferences.

Recent Publications

- Andrei, Stefan, Osborne, Lawrence, and Smith, Zanthia: "Designing an American Sign Language Avatar for Learning Computer Science Concepts for Deaf or Hard-of-Hearing Students and Deaf Interpreters," *AACE Journal of Educational Multimedia and Hypermedia*, ISSN# 1055-8896, http://www.aace.org/pubs/jemh/.
- Cheng, A.M.K., Andrei, S., Mozahid, Haque: Optimizing the Linear Real-Time Logic Verifier. *Proceedings of the 19th IEEE Real-Time and Embedded Technology and Applications Symposium*

(RTAS'13), WiP Session, IEEE Computer Society, Philadelphia, United States, April 9–11, 2013.

- Stefan Andrei, Albert Cheng, Vlad Radulescu, Timothy McNicholl. Toward an optimal power-aware scheduling technique. *Proceedings of 14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC'12)*, IEEE Computer Society, Timisoara, Romania, September 26-29, 2012.
- Stefan Andrei, Zanthia Smith, Lawrence Osborne: Implementing an American Sign Language Avatar for Enhancing Learning of Computer Science Concepts for Deaf or Hard-of-Hearing Students and Deaf Interpreters, *Proceedings of the Society for Information Technology & Teacher Education International Conference (SITE 2012)*, http://site.aace.org/conf/, Austin, Texas, USA, March 5-9, 2012.
- Stefan Andrei, Albert Cheng, Gheorghe Grigoras, Vlad Radulescu: An Efficient Scheduling Algorithm for the Non-preemptive Independent Multiprocessor Platform. *International Journal of Grid and Utility Computing*, Vol. 3, No. 4, pp. 215-223, 2012.
- Stefan Andrei, Albert Cheng, Vlad Radulescu. Estimating the number of processors towards an efficient non-preemptive scheduling algorithm. *Proceedings of 13th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC'11)*, IEEE Computer Society, Timisoara, Romania, September 25-28, 2011.
- Stefan Andrei, Kathlyn Doss, Kami Makki. Proof Automation for Program Termination. *Proceedings of 2nd World Congress on Computer Science and Information Engineering* (CSIE'11), IEEE Computer Society, Changchun, China, June 17-19, 2011.
- Stefan Andrei, Hikyoo Koh: A Fixed-Point Approach towards Efficient Models Conversion. *Information Technologies and Control*, No. 2, pages 12-17, 2010.
- Stefan Andrei, Albert Cheng: Efficient Verification and Optimization of Real-Time Logic Specified Systems, *IEEE Transaction on Computers*, Volume 58, Number 12, pp. 1640-1653, 2009.

Recent Professional Development Activities

- 2012 - 2017: co-PI of the National Science Foundation Grant (2012-2017) "*Addressing the Gulf Coast Region's Graduation Rate Crisis in Mathematics and Computer Science*," Award No. DUE-1154606 ($583,096), PI is Dr. Kumer Das.

Name

Peggy Doerschuk, University Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	Tulane University, New Orleans, Louisiana	1990
B.S.	Mathematics	University of Southwestern Louisiana, Lafayette, Louisiana	1970

Academic Experience

- University Professor, Department of Computer Science, Lamar University, 2011–present.
- Professor, Department of Computer Science, Lamar University, 2004-2011.
- Associate Professor, Department of Computer Science, Lamar University, 1997-2004.
- Assistant Professor, Department of Computer Science, Lamar University, 1993-1997.
- Assistant Professor, Computer Science Department, University of Alabama, 1990-1993.
- Teaching Assistant, Tulane University, 1984-1987.

Non-academic Experience

- Neural Network Consultant, Ochsner Health Plan, New Orleans, 1993-1995.

Honors and Awards

- PI/Co-PI on $2 million in grants from NSF, TX, NASA, Army, ExxonMobil, CREU, LU
- Lamar University Professor 2011.
- Andrew Green College of Engineering Performance Award 2000.
- University Merit Award 1997.
- Summer Faculty Research, U. S. Army 1991, 1992.
- Research Internship, Honeywell Artificial Intelligence Research Lab, Minneapolis 1987-88.

Service Activities

- Proposal Reviewer, National Science Foundation 2008-2010, 2013.
- Director of STAIRSTEP, Lamar University, 2009-present.
- Director of INSPIRED, Lamar University, 2007-2011.
- Director of WIRED, 2002-2008.

Recent Publications

- "An INSPIRED Game Programming Academy for High School Students," P. Doerschuk, J. Liu, and J. Mann, Proceedings of the 42nd ASEE/IEEE Frontiers in Education Conference, October, 2012.
- "STAIRSTEP: An Interdisciplinary Program for Retention and Outreach in STEM," P. Doerschuk, C. Bahrim, J. Daniel, J. Kruger, J. Mann, C. Martin, Proceedings of the 41st ASEE/IEEE Frontiers in Education Conference, October, 2011.
- "A Survey of Popular Game Creation Platforms Used for Computing Education," Kathlyn Doss, Valerie Juarez, Daniel Vincent, Peggy Doerschuk, Jae Liu, Proceedings of the 41st ASEE/IEEE Frontiers in Education Conference, October, 2011.
- "INSPIRED High School Computing Academies," Peggy Doerschuk, Jiangjiang Liu, Judith Mann, ACM Transactions on Computing Education, Vol. 11, Issue 2, Article 7, July 2011.
- "STAIRSTEP, A NSF Sponsored Program for Broadening the Science Pipeline at Lamar University," P. Doerschuk, C. Bahrim, J. Daniel, J. Kruger, J. Mann, C. Martin, abstract published in Education Today: Trends and Research, 8th Annual Lamar University Education Research Conference, March 24-25, 2011.

- "INSPIRED Broadening Participation in Computing: Most Successful Strategies and Lessons Learned," P. Doerschuk, J. Liu, J. Mann, Proceedings of the 40th ASEE/IEEE Frontiers in Education Conference, October, 2010, Washington, D.C., pages T2H1-6.
- "Work in Progress: STAIRSTEP – A Program for Expanding the Student Pipeline," P. Doerschuk, C. Bahrim, J. Daniel, J. Kruger, J. Mann, C. Martin, Proceedings of the 39th ASEE/IEEE Frontiers in Education Conference, October, 2009, San Antonio, TX, pages M2F-1-2.
- "Exploring Computer Science through Autonomous Robotics," Z. Henkel, P. Doerschuk, J. Mann, Proceedings of the 39th ASEE/IEEE Frontiers in Education Conference, October, 2009, San Antonio, TX, pages T2G-1-6.
- "INSPIRED Broadening Participation: First Year Experience and Lessons Learned," P. Doerschuk, J. Liu and J. Mann, Proceedings of the 14th ACM-SIGCSE Annual Conference on Innovation and Technology in Computer Science Education, July, 2009, Paris, pages 238-242.
- "Increasing Participation of Females and Minorities in Computing," P. Doerschuk, J. Liu and J. Mann, IEEE Computer, Vol. 24, April, 2009.
- "INSPIRED Computing Academies for Middle School Students: Lessons Learned," P. Doerschuk, J. Liu and J. Mann, Proceedings of the Fith Richard Tapia Celebration of Diversity in Computing Conference, Portland, Oregon, April 1-4, 2009, pages 52-57.
- "INSPIRED Computing Academies for Middle and High School Students," video produced by undergraduate Zachary Henkel and the INSPIRED team, broadcast in the Channel SIGCSE '09 Video Exhibition, at the International Conference of the Special Interest Group in Computer Science Education, March 2009.
- "Engaging K-12 through Graduate Students with Robotics," P. Doerschuk and J. Liu, Proceedings of the 44th Annual Conference of the Association for Computer Educators in Texas, October, 2008.
- "Work in Progress – INSPIRED: Promoting Diversity, Retention, Outreach and Globalization Readiness," P. Doerschuk, J. Liu and J. Mann, Proceedings of the 38th Annual Frontiers in Education Conference, October, 2008.
- "Sat-based Weighted Planning," S. Andrei and P. Doerschuk., in 2008 International Conference on Automation, Robotics and Control Systems (ARCS-08), pages 4-53, 2008.

Recent Professional Development Activities

- Presented papers at the ASEE/IEEE Frontiers in Education Conference, 2012, 2011, 2010, 2009, 2088, the 14th ACM-SIGCSE Annual Conference on Innovation and Technology in Computer Science Education, July, 2009, Paris, the national 2009 Richard Tapia Celebration of Diversity in Computing Conference, April, 2009, the 44th Annual Conf. of the Association for Computer Educators in Texas, October, 2008.
- Participated in NSF Broadening Participation in Computing Grantees' Meetings, January 2009, 2010, 2011, 2012.
- Participated in STEP Grantees Meeting, March, 2009, 2010, 2011, Washington, D.C.
- Participated in Texas STEP Grantees Workshop, May, 2010, Dallas, Oct. 2010, Houston.

Name

Hikyoo Koh, Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	University of Pittsburgh	1978
M.S.	Computer & Information Science	University of Hawaii	1971
B.A.	Law	YungNam University	1964

Academic Experience

- Professor, Department of Computer Science, Lamar University, 1991-present.
- Associate Professor, Department of Computer Science, Lamar University, 1985-1991.
- Assistant Professor, Department of Computer Science, Lamar University, 1981-1985.
- Assistant Professor, Computer Science Department, Wichita State University, 1978-1981.
- Teaching Fellow, Computer Science Department, University of Pittsburgh, 1973-1978.

Non-academic Experience

- Programmer, Population Institute, Honolulu, Hawaii, 1971-1973.
- Lt. Colonel (retired), Korean Air Force, 1953-1973.

Current Membership in Professional Organizations

Honors and Awards

- Outstanding Service Award, Advisory Council on Democratic and Peaceful Unification of Korea, September 2005.

Service Activities

- Supervised 23 Project/Thesis while at Lamar.
- Faculty Advisor for Lamar UPE Student Chapter, 2005-2009.
- Reviewer for "Crafting a Compiler" 2nd Edition, by Fisher, Cytron and LeBlanc., published by Addison-Wesley Publishing, January 2009.
- Faculty Evaluator included in a research proposal "Lab-based Learning of Multi-Core Parallel Programs for the Design and Analysis of Algorithms" submitted to NSF by Quoc-Nam Tran, CS Department, Lamar University, August 2009.
- Reviewer for "Observability using Aspect-Oriented Programming for OO Software Testing" for The International Journal of Systems Assurance Engineering and Management (IJSAEM), January, 2011.

Recent Publications

- "Investigations of Copyright Issues in Fair Use Applications," Hawaii International Conference on Education, Honolulu, Hawaii, January 2010.
- "Exploring Some Critical Issues in Computer Ethics Education," jointly with Haejin Koh, Hawaii International Conference on Education, Honolulu, Hawaii, January 2010.
- "A Fixed-Point Approach Towards Efficient Models Conversion," jointly with Stefan Andrei, The Journal of Theoretical Computer Science, Elsevier Inc., July 2008.
- "An Integrated Approach to Computer Ethics Education," Hawaii International Conference on Education, Honolulu, Hawaii, January 2007.

Recent Professional Development Activities

- Attended 6 Blackboard workshops, Lamar University for Distance Education, January – March 2013.
- A paper "A Newly Integrated Approach to Computer Ethics Education incorporating Case Studies," in preparation jointly with Stefan Andrei, CS Department, Lamar University to be submitted to World Conference on E-Learning, Las Vegas, Nevada, October 2013.
- Hawaii International Conference on Education, Honolulu, Hawaii, January 2010.
- Presented a paper "Investigations of Copyright Issues in Fair Use Applications," Hawaii International Conference on Education, Honolulu, Hawaii, January 2010.
- Attended ABET faculty Workshop, Pittsburgh, Pennsylvania, June, 2008.
- Attended Hawaii International Conference on Education, Honolulu, Hawaii, January 2008.
- Presented a paper "Exploring Some Critical Issues in Computer Ethics Education," jointly with Haejin Elizabeth Koh, University of Hawaii at Manoa, and chaired a session on Higher Education, Hawaii International Conference on Education, Honolulu, Hawaii, January 2008.

Name

Jiangjiang Liu, Associate Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science & Engineering	Sep. 2004 University at Buffalo, The State University of New York	2004
M.S.	Computer Science & Engineering	University at Buffalo, The State University of New York, USA	2003
B.E.	Computer Engineering	Beijing University of Posts and Telecommunications, China	1997

Academic Experience

- Associate Professor, Department of Computer Science, Lamar University, 2009-present.
- Assistant Professor, Department of Computer Science, Lamar University, 2004-2009.

Current Membership in Professional Organizations

- The Institute of Electrical and Electronics Engineers
- Women in Engineering
- The Association for Computing Machinery
- ACM Special Interest Group on Computer Architecture
- Women in Computing Research

Honors and Awards

- $400,000 from National Science Foundation (NSF), "CAREER: An Effective Integration of Research and Education on High-Speed and Energy-Efficient Interconnects for Multi-Core and Multi-Thread Systems," Sept. 2009 – present.

Service Activities

- Reviewer for IEEE International Symposium on Circuits and Systems, Annual IEEE Frontiers in Education Conference, and ACM Technical Symposium on Computer Science Education.
- Advisor: undergraduate and graduate research.

Recent Publications

- Liu, C. Lin, E.P. Hasson, and Z.D. Barnett, "Computer Science Learning made Interactive – A One-Week Alice Summer Computing Workshop for K-12 Teachers," Proc. 42nd Annual IEEE Frontiers in Education Conference (FIE 2012), pp. 128-133, Seattle, WA, Oct. 3-6, 2012.
- P. Doerschuk, J. Liu, J. Mann, "An INSPIRED Game Programming Academy for High School Students", Proc. 42nd Annual IEEE Frontiers in Education Conference (FIE 2012), pp. 122-117, Seattle, WA, Oct. 3-6, 2012.
- Liu and J. Zhang, "Interconnect compression and its benefits for multi-core systems," Proc. 25th IEEE International System-on-Chip Conference (SOCC 2012), pp. 165-170, Niagara Falls, NY, Sept. 12-14, 2012.
- Liu, C. Lin, P. Potter, E.P. Hasson, Z.D. Barnett, and M. Singleton, "Going Mobile with App Inventor for Android – A One-Week Computing Workshop for K-12 Teachers," 44th ACM Technical Symposium on Computer Science Education (SIGCSE 2013), accepted.
- Liu, E.P. Hasson, Z.D. Barnett, and P. Zhang "A Survey on Computer Science K-12 Outreach: Teacher Training Programs," Proc. 41st Annual IEEE Frontiers in Education Conference (FIE 2011), pp. T4F-1 – T4F-6, Rapid City, SD, Oct. 12-15, 2011.

- P. Doerschuk, J. Liu, J. Mann, "INSPIRED High School Academies for Broadening the Computing Pipeline", ACM Transaction on Computing Education (TOCE) , article 7, vol. 11, no. 2, 2011.
- Liu, C. Lin, E.P. Hasson, Z.D. Barnett, "Introducing Computer Science to K-12 through A Summer Computing Workshop for Teachers, " 42nd ACM Technical Symposium on Computer Science Education (SIGCSE 2011), pp. 389-394, Dallas, TX, Mar. 9-12, 2011.
- Lin, J. Liu, E.P. Hasson, Z.D. Barnett, "A Computing Workshop for Updating Middle School Computer Science Programs," 5th Annual Edition of International Technology, Education and Development Conference(INTED 2011).
- K. Doss, V. Juarez, D. Vincent, P. Doerschuk, and J. Liu , "Work in Progress - A Survey of Popular Game Creation Platforms Used for Computing Education," Proc. 41st Annual IEEE Frontiers in Education Conference (FIE 2011), pp. F1H-1 – F1H-2, Rapid City, SD, Oct. 12-15, 2011.
- Liu, J.Y. Zhang, and N.R. Mahapatra, "Interconnect System Compression Analysis for Multi-core Architectures," Proc. 23rd Annual IEEE International ASIC/SOC Conference (ASIC/SOC 2010), pp. 317-320, Las Vegas, NV, Sep. 27-29, 2010.
- P. Doerschuk, J. Liu, and J. Mann, "INSPIRED Broadening Participation in Computing: Most Successful Strategies and Lessons Learned," Proc. 40th Annual IEEE Frontiers in Education Conference (FIE 2010), pp. T2H-1 - T2H-6, Arlington, Virginia, Oct. 27-30, 2010.
- P. Doerschuk, J. Liu, J. Mann, "Increasing Participation of Females and Minorities in Computing", IEEE Computer, pp. 110-113, vol. 24, 2009.
- P. Doerschuk, J. Liu, J. Mann, "INSPIRED broadening participation: first year experience and lessons learned," Proc. 14th Annual ACM SIGCSE Conference on innovation and Technology in Computer Science Education (ITiCSE 2009), pp. 238-242, Paris, France, July 06 - 09, 2009.
- P. Doerschuk, J. Liu, J. Mann, "INSPIRED Computing Academies for Middle School Students: Lesson Learned", Tapia Celebration of Diversity in Computing (Tapia 2009), pp. 52-57, Portland, OR, Apr. 1-4, 2009.
- Liu and N.R. Mahapatra, "The Role of Interconnects in the Performance Scalability of Multicore Architectures," Proc. 21st Annual IEEE International System-on-Chip conference (SOCC 2008), pp. 21-24, Newport Beach, CA, Sept. 17-20, 2008.

Recent Professional Development Activities

- ABET Symposium, 2012.
- Computer Research Associate for Women (CRA-W) Advanced Career Mentoring Workshop (CAPP), 2012.
- ABET IDEAL Workshop (Gloria Rogers), 2008.
- CO-PI: $490,633 from NSF, "Increasing Student Participation in Research Development (INSPIRED) Program", Sept. 2007-August 2010.

Name

Kami Makki, Associate Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	University of Queensland	1997
MEngSc.	Computer Science	University of New South Wales	1991
BSc, MSc	Civil Engineering	University of Tehran	1980

Academic Experience

- Associate Professor, Department of Computer Science, Lamar University, 2008-present.

Non-academic Experience

- Software Engineer, Centre for Information Technology, Sydney, Australia, 1995-1998.
- Systems Engineer, Daihatsu, Brisbane, Australia, 1992-1993.

Current Membership in Professional Organizations

- The Institute of Electrical and Electronics Engineers

Honors and Awards

- 2010 Plaque Award for Outstanding Service from 53rd IEEE International Conference IEEE Global Communications Conference, Exhibition & Industry Form (GlobeCom'10), In Recognition of Outstanding Contributions to IEEE GLOBECOM 2010.
- 2007 Plaque Award from NSF/IEEE International Workshop on Theoretical and Algorithmic Aspects of Sensor and Ad-hoc Networks (WTASA'07), In Recognition for Outstanding Research Contributions, Leadership and Service, Sponsored by National Science Foundation (NSF).

Service Activities

- Judge at Science and Engineering Fair at International Sustainable World (Energy, Engineering, and Environment) Project Olympiad organized by Cosmos Foundation, I-SWEEEP, George Brown Center, Houston, TX, May 5, 2012.
- STARS Wings Mentor of Lamar University for the academic year 2012.
- College of Arts & Sciences Mirabeau Scholarship Committee, Committee Member.
- College of Arts & Sciences Faculty Council, Council member.
- Director of Department of Computer Science Upsilon Pi Epsilon Society.
- University Undergraduate Curriculum Council, Secretary.
- Faculty Senate, Academic Issues Sub Committee, Senator.

Recent Publications

- Khojastehpour M., Makki S., Sun B., A Delineated R-tree Indexing Method for Managing Moving Objects, special issue of International Journal of Information and Decision Sciences, Vol:4 issue 2/3, pp 182—198, 2012.
- Yu S., Zhou W., Dou W., Makki S., Why it is hard to fight against cyber criminals, In Proceedings of the first International Workshop on Network Forensics, Security and Privacy (NFSP'2012) Macau, China, June 18-21, 2012.
- Sumaray Audie, Makki S., A Comparison of Data Serialization Formats For Optimal Efficiency on a Mobile Platform, In Proceedings of the 6th International Conference on Ubiquitous Information Management and Communication (ACM SIGKDD-SIGAPP ICUIMC 2012), February 20-23, 2012, Kuala Lumpur.
- Sandoval Ramon, Makki S., Sun B., a Power-Efficient Data Fusion Assurance Method Using Silent Negative Voting and a Sleep/Wakeup Protocol, International Conference on Computing, Networking and Communications, (ICNC 2012), Maui, Hawaii, USA, January 30 - February 2, 2012.
- Andrei S., Doss K., Makki S. Kami. Proof Automation for Program Termination. Lecture Notes in

Electrical Engineering (LNEE), 2012, Volume 125, 453-459, DOI: 10.1007/978-3-642-25789-6_61. published in Recent Advances in Computer Science and Information Engineering Springer (CSIE'11), In Proceedings of 2nd World Congress on Computer Science and Information Engineering IEEE Computer Society, June 17-19, 2011, Changchun, China.

- Husain A., Makki S. K., Osborne L., Sun B., A highly adaptable information dissemination Strategy, published in the "Communications in Computer and Information Science" (CCIS) Series of Springer LNCS, Vol. 194, Ezendu Ariwa and Eyas El-Qawasmeh (Eds.) 20-22 July, 2011. In Proceedings of International Conference on Digital Enterprise and Information (DEIS'11), London, United Kingdom.
- Liu C., Zhou C., Pissinou N., Makki, S., Joint Call Admission Control in Integrated Wireless LAN and 3G Cellular Networks, in Recent Advances in Wireless Communications and Networks Wireless edited by Jia-Chin Lin, ISBN 978-953-307-274-6, InTech Open Access Publisher, pp 189-210, August 2011.
- Makki S. K., Sun B., Osborne L., Husain A., James Carnley, Efficient Information Dissemination and Collection Strategies for Wireless Sensor Networks, International Journal on New Computer Architectures and Their Applications (IJNCAA), pp 247--258 Vol :2, issue 1, The Society of Digital Information and Wireless Communications, 2012.
- Miranda Luis O., Cordova Javier, Joel M. Quiles, Makki S. K., Optimized Strategies for the Mastermind Game, In International Journal on Computing (JoC), Vol. 1, No.3, pp 19--23, August 2011.

Recent Professional Development Activities

- Technical Program Committee Member, International Symposium on Security in Computing and Communications (SSCC'13), August 22-24, 2013, Mysore, India.
- Technical Program Committee Member, IEEE International Symposium on Anonymity and Communication Systems (IEEE ACS 2013), Melbourne, Australia, July 16-18, 2013.
- Lamar University, $5,000 (PI). Title: Efficacy of Data Serialization Formatting Methods for Mobile Environment, Research Enhancement grant, May 18, 2012.
- Presented Seminar on "Hot Spot Aware Energy Efficient Clustering Approach for Wireless Sensor Networks" at the 8th Annual IEEE Consumer Communications and Networking Conference, on January 11, 2011.
- Attended the Faculty Workshop organized by Center for Teaching+Learning Enhancement. Title: Selecting Effective Instructional Methods to Meet Your Learning Goals, by Dr. Bob Noyd, Air Force Academy, Spindletop Room/ Gray Library, Tuesday 11:15-12:30, March 23, 2011.

Name

Lawrence J. Osborne, Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D	Computer Science	University of Missouri-Rolla	1989
M.S.	Computer Science	University of Missouri-Rolla	1985
M.A.	Mathematics	University of Missouri-Columbia	1981
B.S.	Mathematics Education	Southeast Missouri State University	1968

Academic Experience

- Professor, Department of Computer Science, Lamar University, 2000-present.
- Associate Professor, Department of Computer Science, Lamar University, 1994-2000.
- Assistant Professor, Department of Computer Science, Lamar University, 1990-1994.
- Chair, Department of Computer Science, Lamar University, 1993-2012.

Certifications or Professional Registrations

- Program Evaluator, Accreditation Board for Engineering and Technology (ABET), 2012, 2010.

Current Membership in Professional Organizations

Honors and Awards

- Faculty Fellowship Research Grant: "Parallel Simulated Annealing and Integer Programming Algorithms for the Steiner Problem on Networks." Southwest Missouri State University, Springfield, Missouri, 1990.

Service Activities

- Chair, Academic IT Committee, Lamar University, 2013.
- Member, IT Steering Committee, Lamar University, 2013.
- Chair, Computer Science Curriculum Committee, 2012-2013.
- Chair, Department of Computer Science Alumni Affairs including representing department on Hall of Honor Committee and Department Advisory Board, Lamar University, 2013.
- Reviewer for ACM SIGCSE Conference for more than 10 years.

Recent Publications

- Andrei, Stefan, Osborne, Lawrence, and Smith, Zanthia, "Implementing an American Sign Language Avatar for Enhancing Learning of Computer Science Concepts for Deaf or Hard-of-Hearing Students and Deaf Interpreters." Society for Information Technology & Teacher Education International Conference (SITE 2012), Austin, Texas, March 5-9, 2012.
- Husain A., Makki S. K., Osborne L., Sun B., "A highly adaptable information dissemination Strategy." Communications in Computer and Information Science (CCIS Series of Springer), Vol. 194, Ezendu Ariwa and Eyas El-Qawasmeh (Eds.), Digital Enterprise and Information Systems International Conference (DEIS'11), 20-22 July, 2011, London, United Kingdom.
- Husain, Amir, Makki, Kami, Sun, Bo, and Osborne, Lawrence, "A Highly Adaptable Information Dissemination Strategy ". The International Conference on Digital Enterprise and Information Systems (DEIS 2011), London, July 20-22, 2011.
- Joshi, Manoj, Osborne, Lawrence, Sun, Bo, and Makki, Kami, "Hot Spot Aware Energy Efficient Clustering Approach for Wireless Sensor Networks," Proceedings of IEEE Consumer Communications and Networking Conference (CCNC), sponsored by IEEE Communications Society, January 9-12, 2011, Las Vegas, Nevada.

- Andrei, Stefan, and Osborne, Lawrence, "INSTEAD: A Learning Model in Teaching Computer Science to Freshmen Students," Proceedings of Association for Computer Educators of Texas (ACET) 2010, October 7-9, League City, Texas.
- Andrei, Stefan, and Osborne, Lawrence, "Optimal Scheduling of Urgent Preemptive Tasks," 16th IEEE International Conference on Embedded and Real Time Computing Systems and Applications (RTCSA), August 23-25, 2010, Macau SAR, P.R.C.
- Beggan, Dominic, Osborne, Lawrence, and Woodruff, Cliff, "The Impact of Hurricane Rita on an Academic Institution, Lessons Learned," Journal of Disaster Studies, Policy and Management, 2009.
- Andrei, Stefan, and Osborne, Lawrence, EDULEARN10 (International Association for Technology, Education and Development (IATED)), "Enhancing Learning Using a Dynamic Instructor-Student Collaborative Approach," Virtual Presentation with video, July 2010, Barcelona, Spain.
- Madaan A., Makki S., Osborne L., Sun B., An Intelligent Energy Efficient Target Tracking Scheme for Wireless Sensor Environment, In Proceedings of the IEEE International Symposium on Wireless Pervasive Computing, ISWPC'10, Palazzo Ducale, Modena, Italy, May 5-7, 2010.
- Sun, Bo, and Osborne, Lawrence, "WSNED – A Suite of Data Collection and Dissemination Applications for Wireless Sensor Network Education." Proceedings of the 2010 Conference of the Consortium for Computing Sciences in Colleges, South Central Region, St. Edward's University, Austin , Texas April 23-24, 2010.
- Bo Sun, Lawrence Osborne, and T. Andrew Yang, 'Module-based Courseware for Teaching Secure Wireless Sensor Networks, accepted to IASTED International Conference on Computers and Advanced Technology in Education (CATE 2009), St. Thomas, US Virgin Islands, November 22-24, 2009.
- Andrei, S., Cheng, A.M.K., Grigoras, G., Osborne, L, "Incremental Theorem Proving." Journal of Information Technology and Control, vol. 1, (12 pages) 2008.

Recent Professional Development Activities

- Das, Kumer PI, Andrei, Stefan, CO-PI, Daniel, Dale, CO-PI, and Osborne, Lawrence CO-PI, "Addressing the Gulf Coast Region's Graduation Rate Crisis in Mathematics and Computer Science (ASCENT)" NSF. $546,897.00 over 5 year proposal. This grant has matching commitments from Lamar Research Office of $61,680, Dean Nichols for $30,000, and Provost Doblin $22,500. Grant is from June 1, 2012.
- Bo Sun, PI, Kami Makki and Lawrence Osborne CO-PIs, "MRI: Acquisition of Equipment to Develop an Energy Efficient and Reliable Wireless Sensor Network for Urban Landscape Irrigation Management System" NSF proposal in MRI program. Direct cost: $182,363 over three years, 2009-2012.
- Andrei, Stefan, and Osborne, Lawrence, "INSTEAD (Instructor-student collaborative approach)", $1000 Mini-Grant for 2008-2009 from Office of the Provost and University Assessment Coordinator (Tom Matthews).

Name

Timothy E. Roden, Associate Professor, tenure-track

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	University of North Texas	2005
M.S.	Computer Science	University of Texas at Arlington	1995
B.S.	Computer Science	Angelo State University	1989
B.A.	English	Midwestern State University	1986

Academic Experience

- Associate Professor, Department of Computer Science, Lamar University, 2013-present.
- Assistant Professor, Department of Computer Science, Lamar University, 2012-2013.
- Associate Professor and Department Head, Computer Science Department, Angelo State University, 2007-2012.
- Assistant Professor, Computer Science Department, University of Louisiana at Lafayette, 2005-2007.
- Lecturer, Computer Science Department, University of North Texas, 2001-2005.
- Graduate Teaching Assistant, Computer Science Department, University of Texas at Arlington, Fall 1991.
- Assistant Instructor, Computer Science Department, Angelo State University, Spring 1990.

Non-academic Experience

- Software Engineer, Idaho National Engineering Laboratory, 1997-2000.
- Senior Software Engineer, Evans & Sutherland, 1991-1997.

Current Membership in Professional Organizations

- Association for Computing Machinery (ACM).
- ACM Special Interest Group on Graphics (SIGGRAPH).

Honors and Awards

- Nominated for ASU Rammy "Professor of the Year", College of Sciences, April 2010.
- National Science Foundation Scholarship (2002-2003, renewed for 2003-04).
- University of North Texas Faculty Scholarship (2002-03, 2003-04, 2004-05).

Service Activities

- Faculty Sponsor, Association for Computing Machinery (ACM) Student Chapter, Lamar University, 2013-present.
- Associate Editor, Journal of Graphics Tools, June 2012-present.
- Editorial Advisory Board, Algorithmic and Architectural Gaming Design: Implementation and Development, IGI Global, 2012.
- Reviewer, Transactions on Computational Intelligence and AI in Games, April 2011.
- Review Committee, 42nd ACM Technical Symposium on Computer Science Education (SIGCSE), Dallas, Texas, March 2011.
- Program Committee, 5th International Conference on E-learning and Games (Edutainment 2010), Changchun, China, August 2010.
- Review Committee, 41st ACM Technical Symposium on Computer Science Education (SIGCSE), Milwaukee, Wisconsin, March 2010.
- Program Committee, 23rd International Florida Artificial Intelligence Research Society Conference (FLAIRS-23), Daytona Beach, Florida, May 2010.
- Review Committee, ITiCSES 2009, 14th Annual Conference on Innovation and Technology in

Computer Science, Paris, France, July 2009.

- Graphics Section Editor, Programming Gems 7, Charles River Media, February 2008.

Recent Publications

- T. Roden and R. LeGrand. "Growing a Computer Science Program with a Focus on Game Development", Proceedings of the 2013 ACM Technical Symposium on Computer Science Education, Denver, CO, pp. 555-560, March 6-9, 2013.
- R. LeGrand, T. Roden, and R. Cytron. "Nonmanipulable Collective Decision-making for Games", in Algorithmic and Architectural Gaming Design: Implementation and Development, IGI Global, May 2012.
- T. Roden, "Cheap Talk: Dynamic Real-Time Lipsync", in Game Programming Gems 7, Charles River Media, pp. 455-461, February 2008.
- H. Boudreaux, J. Etheredge, and T. Roden, "Adding Handheld Game Programming to a Computer Science Curriculum", Proceedings of the Third International Conference on Game Development in Computer Science Education, Miami, FL, pp. 16-20, Feb. 28-Mar. 3, 2008.

Recent Professional Development Activities

- "System, Method and Apparatus for Securely Saving/Retrieving Data on a Data Storage Device", U.S. Patent Application D-0582, September 14, 2012.
- Accreditation Board for Engineering and Technology (ABET) Program Assessment Workshop, Milwaukee, Wisconsin, September 2012.
- "Netsafe Cloud Technology Project", Grant from ASU Information Technology Department, June 2012, $7,154.
- "MedHab Technology Project", Private Grant from Fort-Worth-based MedHab, LLC., September 2011, $108,394.
- "Development of Online Course in Android Programming", Research Grant, USAA (Financial Services Company), June 2011, $5,000.
- Game Developer's Conference, San Francisco, California, March 2011.
- "Development of University Infrastructure and Curriculum for a Course in iPhone Programming", Faculty Development and Enrichment Fund Grant, Angelo State University, March 2010, $2,000.
- Game Developer's Conference, San Francisco, California, March 2010.
- Game Developer's Conference, San Francisco, California, March 2008.
- "Establishing the Entertainment Computing Laboratory for Undergraduate Education and Research", University Grant, Angelo State University, January 2008, $37,000.
- Angelo Science Partnership for Undergraduate Recruitment, Retention, and Success (SPURRS), National Science Foundation #08-569-STEP, 2008, $999, 294. Co-PI.

Name

Bo Sun, Associate Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D.	Computer Science	Texas A&M University	2004
M.S.	Computer Communications	Beijing University of Posts & Telecommunications	1999
B.E.	Computer Communications	Nanjing University Posts & Telecommunications	1996

Academic Experience

- Associate Professor, Department of Computer Science, Lamar University, 2009-present.
- Assistant Professor, Department of Computer Science, Lamar University, 2004-2009.

Current Membership in Professional Organizations

- Institute of Electrical and Electronics Engineers (IEEE), Sigma Xi.

Service Activities

- Undergraduate Freshman/Sophomore Advisor, Department of Computer Science, Lamar University.
- NSF Panelist, NSF (Major Research Instrumentation) MRI program, National Science Foundation, July 2010.
- "Teaching Application Development of Wireless Sensor Networks using Motes and Sensors", workshop proposal presented at 40th ACM SIGCSE 2009, March 4-7, 2009, Chattanooga, TN U.S.A.
- Academic Computing Committee, Lamar University, 2008-2010.

Recent Publications

- B. Sun, X. Shan, K. Wu, and Y. Xiao, "Anomaly Detection based Secure In-Network Aggregation for Wireless Sensor Networks", IEEE Systems Journal, 2013, Vol. 7, No. 1, pp. 13 – 25.
- R. Wang, S. Burleigh, P. Parikh, C.J. Lin, and B. Sun, "Licklider Transmissions Protocol (LTP)-based DTN for Cislunar Communications", IEEE/ACM Transaction on Networking, Vol. 19, No. 2, April 2011, pp. 359-368.
- F. Yu, B. Sun, V. Krishnamurthy, S. Ali, "Application Layer QoS Optimization for Multimedia Transmission over Cognitive Radio Networks", ACM Wireless Networks, 2010, Vol. 17, No. 2, pp. 371-383.
- Y. Xiao, H. Chen, K. Wu, B. Sun, Y. Zhang, X. Sun, and C. Liu, "Coverage and Detection of a Randomized Scheduling Algorithm in Wireless Sensor Networks", IEEE Transactions on Computers, Vol. 59, No. 4, April 2010, pp. 507-521.
- B. Sun, G. Yan, Y. Xiao, and T.Andrew Yang, "Self-propagating Mal-packets in Wireless Sensor Networks: Dynamics and Defense Implications", Elsevier Ad Hoc Networks Journal, 2009, http://dx.doi.org/10.1016/j.adhoc.2009.04.003.
- T. Andrew Yang, D. Jain, and B. Sun, "Development of Emulation-Based Projects for Teaching Wireless Sensor Networks", Journal of Computing Sciences in Colleges, 2008.
- B. Sun, Y. Xiao, C.-C Li, H.-H Chen, and T. Andrew Yang, "Security Co-Existence of Wireless Sensor Networks and RFID For Pervasive Computing", Elsevier Computer communications Journal, 2008, Vol. 31, No. 18, pp. 4294-4303.
- T. Andrew Yang, D. Jain, and B. Sun, "Development of Emulation-Based Projects for Teaching Wireless Sensor Networks", Journal of Computing Sciences in Colleges, 2008, vol. 24, No. 2, pp. 64-71.
- K. Makki, B. Sun, L. Osborne, A. Husain, and J. Carnley, "Efficient Information Dissemination and Collection Strategies for Wireless Sensor Networks", accepted to Internal Journal of New Computer

Architectures and Their Applications, 2012.

- Ramon Sandoval, S. Kami Makki, and Bo Sun, "Utilizing Silent negative voting and sleep/wakeup method for power efficient data fusion", International Conference on Computing, Networking and Communications, (ICNC 2012), Maui, Hawaii.
- M. Joshi, B. Sun, K. Makki, and L. Osborne, "Hot Spot Aware Energy Efficient Clustering Approach for Wireless Sensor Network", IEEE CCNC 2011, Las Vegas, Nevada, 2011.
- J. Carnley, B. Sun, and K. Makki, "TORP: TinyOS Opportunistic Routing Protocol for Wireless Sensor Networks", IEEE CCNC Workshop on Personalized Networks, Las Vegas, Nevada, 2011.
- Madaan A., Makki S., Osborne L., Sun B., "An Intelligent Energy Efficient Target Tracking Scheme for Wireless Sensor Environment", In Proceedings of the IEEE International Symposium on Wireless Pervasive Computing, ISWPC'10, Palazzo Ducale, Modena, Italy, May 5-7, 2010.
- K. Makki, B. Sun, and M. Khojastehpour, "An Efficient Information Access Scheme for Mobile Objects", Proceedings of the IEEE International Conference on Information Reuse and Integration (IRI'09), pp312—323, August 10-12, 2009, Las Vegas, Nevada.
- T. A. Yang, Vishal S. Jadhav, Darshan Chipade, and Bo Sun, "Web 2.0 as an Enabler of Developing Open Content Online Hypertextbooks", Proceedings of the IASTED International Conference on Computers and Advanced Technology in Education (CATE 2009), St. Thomas, US Virgin Islands, November 22-24, 2009.
- Bo Sun, Lawrence Osborne, and T. A. Yang, "Module-based Courseware for Teaching Secure Wireless Sensor Networks", Proceedings of the IASTED International Conference on Computers and Advanced Technology in Education (CATE 2009), St. Thomas, US Virgin Islands, November 22-24, 2009.

Recent Professional Development Activities

- "MRI: Acquisition of Equipment to Develop an Energy Efficient and Reliable Wireless Sensor Network for Urban Landscape Irrigation Management System", The National Science Foundation, awarded amount: $214,363, 09/01/2009 – 08/31/2012.
- "An Energy Efficient and Reliable Wireless Sensor Network for Urban Landscape Irrigation Management System", Lamar Research Enhancement Grant, awarded amount: $5000, Sept. 2010 – Aug. 2011.
- "Wireless Sensor Networks: From Theory to Reality", Lamar Research Enhancement Grant, awarded amount: $5000, Sept. 2008 – Aug. 2009.

Name

Quoc-Nam Tran, Professor, tenured

Education

Degree	Field	Institution	Date
Ph.D	Computer Science	RISC-Linz, University of Linz	1996
M.S.	Computer Science	AIT (Asian Institute of Technology)	1992
B.S.	Mathematics & Computer Science	University of Hochiminh City	1984

Academic Experience

- Professor, Department of Computer Science, Lamar University, 2010-present.
- Associate Professor, Department of Computer Science, Lamar University, 2004-2010.
- Assistant Professor, Department of Computer Science, Lamar University, 1999-2004.
- Visiting Professor, Computer Science Department, Rice University, 2006-2007.
- Assistant Professor, Research Institute for Symbolic Computation (RISC-Linz), 1997.

Non-academic Experience

- Senior Developer for Symbolic Computation, Wolfram Research Inc. (Maker of Mathematica), 1998.

Current Membership in Professional Organizations

- Association for Computing Machinery (ACM).
- Upsilon Pi Epsilon (UPE), International Honor Society for the Computing Sciences.

Honors and Awards

- "Gill Master Award", the highest research award from the College of Engineering, Lamar University.
- University Merit Award, Lamar University, 2004.
- "Goedel Prize" for The Best Ph.D. Dissertation of The Year, Research Institute for Symbolic Computation (RISC-Linz), the University of Linz, Austria, 1996.

Service Activities

- President, Lamar University Faculty Senate, 2012-present.
- Chair, University Graduate Review Committee.
- Academic advisor for 17 students.
- Advisor for 45 graduate student projects.

Recent Publications

- Quoc-Nam Tran, "Finding biomarkers for non-small cell lung cancer diagnosis with novel data mining techniques". In Proceedings of the 2011 International Conference on Bioinformatics & Computational Biology. Volume I, Page 36-41, CSREA Press. Las Vegas, NV, 2011.
- Quoc-Nam Tran, "Algebraic Model Checking for Boolean Gene Regulatory Networks". Chapter 12 in the research book "Software Tools and Algorithms for Biological Systems". Page 113-122. Springer, 2011. ISBN 978-1-4419-7045-9.
- Quoc-Nam Tran, "Improving the Accuracy of Gene Expression Profile Classification with Lorenz Curves and Gini Ratios". Chapter 9 in the research book "Software Tools and Algorithms for Biological Systems". Page 83-90. Springer, 2011. ISBN 978-1-4419-7045-9.

- Hamid Arabnia and Quoc-Nam Tran, Editors. (with Mathew He, Andy Mash, Ashu Solo, and Jack Yang, Associate Editors). Proceedings of the 2011 International Conference on Bioinformatics & Computational Biology. Volume I, Page 1-334, CSREA Press, 2011. ISBN 1-60132-170-8.
- Hamid Arabnia and Quoc-Nam Tran, Editors. (with Mathew He, Andy Mash, Ashu Solo, and Jack Yang, Associate Editors). Proceedings of the 2011 International Conference on Bioinformatics & Computational Biology. Volume II, Page 335-608. CSREA Press, Las Vegas, NV, 2011.
- Hamid Arabnia and Quoc-Nam Tran, Editors. "Software Tools and Algorithms for Biological Systems", Page 1-778. Advances in Experimental Medicine and Biology Series. Springer, 2011. ISBN 978-1-4419-7045-9.
- Quoc-Nam Tran, "Improving non-small cell lung cancer classification in data mining courses". Journal of Computing Sciences in Colleges , Volume 26(5), Page 104-112, 2011.
- Hamid Arabnia and Quoc-Nam Tran, Editors. (with Rui Chang, Mathew He, Andy Mash, Ashu Solo, and Jack Yang, Associate Editors). Proceedings of the 2010 International Conference on Bioinformatics & Computational Biology. Volume I, Page 1-418. CSREA Press, Las Vegas, NV, 2010. ISBN 1-60132-132-5.
- Hamid Arabnia and Quoc-Nam Tran, Editors. (with Rui Chang, Mathew He, Andy Mash, Ashu Solo, and Jack Yang, Associate Editors). Proceedings of the 2010 International Conference on Bioinformatics & Computational Biology. Volume II, Page 419-734. CSREA Press, Las Vegas, NV, 2010.

Recent Professional Development Activities

- PI of the National Science Foundation's research project "Efficient Groebner Bases Computation in Boolean Rings for Temporal Logic Reasoning and Model Checking" (NSF-0917257), $221,000. Duration: 2009-2013.
- Conference Chair for the 17th International Conference on Applications of Computer Algebra (ACA'11), Houston, Texas.
- Member of the International Scientific Committee for the World Academy of Science, Engineering and Technology 2011 Winter International Conference in Dubai, UAE. January 2011.
- Guest editor for the Journal of Symbolic Computation on applications of Groebner bases, 1998-1999, 2004-2006.
- Conference Chair for the Tenth International Conference on Applications of Computer Algebra (ACA'04), Beaumont, Texas.

Name

Sujing Wang, Instructor, Non-tenure-track

Education

Degree	Field	Institution	Date
M.S.	Computer Science	University of Houston	2005

Academic Experience

- Instructor, Department of Computer Science, Lamar University, 2007-present
- Lecturer, Department of Computer Science, Lamar University, 2006-2007
- Teaching Assistant, Computer Science Department, University of Houston, 2002-2005
- Research Assistant, Computer Science Department, University of Houston, 2002-2005

Honors and Awards

- NSF Travel Award for CyberGIS 2012,NSF, 2012
- NSF Travel Award for ACM SIGSPATIAL GIS 2010, NSF, 2010
- Lamar University Instructional Improvements Grant, Lamar University, 2010
- You Make the Different Teaching Certificate, Lamar University, 2009

Service Activities

- Department Textbook Committee, Computer Science Department, Lamar University, 2007-present

Recent Publications

- Z. Chao, S. Wang, G. Forestier, A. Puissant, C.F. Eick. Analyzing the Composition of Cities Using Spatial Clustering, The 2nd ACM SIGKDD International Workshop on Urban Computing, in conjunction with the 19th ACM SIGKDD 2013, Chicago, IL, Aug 11-14, 2013.
- S. Wang and C. F. Eick, "A Spatial Temporal Analysis Framework for Mining Geospatial Datasets", Proc. CyberGIS'12 the First International Conference on Space, Time, and CyberGIS, University of Illinois at Urbana-Champaign, Champaign, IL Aug 6-9, 2012.
- C. F. Eick, Z. Cao, G. Forestier and S. Wang, "A Methodology for Finding Uniform Regions in Spatial Data" , Proc. CyberGIS'12 the First International Conference on Space, Time, and CyberGIS, University of Illinois at Urbana-Champaign, Champaign, IL Aug 6-9, 2012.
- S. Wang, C. Chen, V. Rinsurongkawong, F. Akdag, and C. F. Eick , "Polygon-based Methodology for Mining Related Spatial Datasets", Proc. ACM SIGSPATIAL GIS Workshop on Data Mining for Geoinformatics (DMGI) 2010, San Jose, CA, Nov 6-9, 2010.

Recent Professional Development Activities

- Quality Matters certification for COSC 1173 Programming Lab section 48 online course, 2013
- Quality Matters certification for COSC 1371 Microcomputers section 48 online course, 2013
- Online course development grant for COSC 1173 Programming Lab, 2012

Appendix C – Equipment

The Department of Computer Science has six open labs for students, six faculty research labs, one GPU education lab, and one game development lab. Open labs can be used by all university students including computer science students. There are a total of 400 pieces of hardware including computers, projectors and printers in the department inventory list. All computers in the open labs are on a 3-year upgrade schedule. Research lab computer upgrades are based on a particular faculty member's research funds. Following is a list of the hardware and software in each open lab:

Lab 208

Linux – 22 machines

4 Apple iMac

Lab 212

Windows – 36 machines

MATLAB
Microsoft Office
Microsoft Visual Studio
Netbeans
Notepad++
Scratch
WinSCP
Microsoft Expressions

Lab 213

Windows – 26 machines

QTSpim
Adobe LiveCycle
Android SDK Tools
AppInventor
GameStudio A8
MATLAB
Microsoft Expression
Microsoft Office
Microsoft Visual Studio
Netbeans
Notepad++
Scratch
WinSCP
Xming

Lab 214

Windows - 2 machines

Netbeans

Eclipse
PuTTY
Microsoft Office
Basic Micro Studio
MATLAB

Solaris – 10 machines

SUN Ultra 20 and SUN Ultra 45

Macintosh – 10 machines

Adobe Creative Suite
Eclipse
Netbeans
Microsoft Office

Lab 215

Windows – 24 machines

Microsoft Office
Netbeans
Eclipse
ArgoUML
MATLAB
Notepad++
PuTTY
Scratch

Lab 216A (under reconstruction – summer 2013)

Windows – 15 machines

Microsoft Office
Eclipse
Adobe Creative Suite
Lightwave 3D
Notepad++
PuTTY
SnagIt
Timeline FX

Department Server

6 each SUN Sunfire Server with Linux OS
1 RACK SUN Storage Tek 1000-42
6 each Linux Server
2 SUN Ultra workstation with Solaris OS.

Appendix D – Institutional Summary

1. The Institution

a. Name and address of the institution
Lamar University
4400 S. ML King Jr. Parkway
Beaumont, Texas 77710

b. Name and title of the chief executive officer of the institution
Dr. Kenneth R. Evans, President

c. Name and title of the person submitting the Self-Study Report.
Dr. Timothy E. Roden, Associate Professor, Department of Computer Science

d. Name the organizations by which the institution is now accredited and the dates of the initial and most recent accreditation evaluations.
Southern Association of Colleges and Schools Commission on Colleges. Most recent evaluation: 2005. Next site visit: 2015.

2. Type of Control

Lamar is a state-sponsored public university governed by the Texas State University System Board of Regents.

3. Educational Unit

The Department Chair is Dr. Stefan Andrei who reports to the Dean of the College of Arts & Sciences. The Dean of the college is Dr. Brenda S. Nichols who reports to the Provost. The Provost is Dr. Stephen A. Doblin who reports to the President. The President is Dr. Kenneth R. Evans.

4. Academic Support Units

Art – Donna M. Meeks, Chair
Biology – Dr. Paul Nicoletto, Interim Chair
Chemistry & Biochemistry – Dr. Paul Bernazzani, Chair
Communication – Dr. Stanley O'Brien, Interim Chair
Computer Science – Dr. Stefan Andrei, Chair
Electrical Engineering – Dr. Harley R. Myler, Chair
English & Modern Languages – Dr. Jim Sanderson, Chair
History – Dr. Mary L. Scheer, Chair
Mathematics – Mary E. Wilkinson, Interim Chair
Music – Dr. Kurt Gilman, Interim Chair
Political Science – Dr. Glenn H. Utter, Chair
Psychology – Dr. Randolph A. Smith, Chair
Sociology, Social Work & Criminal Justice – Dr. Kevin B. Smith, Interim Chair

5. Non-academic Support Units

Alumni Affairs – Linda LeBlanc, Director

Computing facilities – Priscilla Parsons, Vice President for Information Technology
Finance – Dr. Cruse Melvin, Interim Vice President for Finance and Operations
Library – Mr. David Carroll, Directory of Library Services
Placement – James Rush, Director of Academic Services
Public Relations – Brian Sattler, Director
Tutoring – Dr. Oney Fitzpatrick, Associate Provost for Student Retention

6. Credit Unit

Computer science laboratory classes meet for 1 hour and 20 minutes per credit hour. Other laboratory classes (such as science labs) can meet for longer periods up to 3 hours per credit hour.

7. Tables

See tables D-1 and D-2, below, for more information about the program.

Table D-1. Program Enrollment and Degree Data

Department of Computer Science, Lamar University

	Academic Year		Enrollment Year					Total Undergrad	Total Grad	Degrees Awarded			
			1st	2nd	3rd	4th	5th			Associates	Bachelors	Masters	Doctorates
Current Year		FT	63	23	20	22	0	128	30	N/A	9	15	N/A
		PT	16	8	9	8	0	41	7				
1 2011		FT	49	22	17	20	0	108	29	N/A	4	13	N/A
		PT	9	10	7	4	0	30	9				
2 2010		FT	48	23	17	15	0	103	36	N/A	9	23	N/A
		PT	4	5	5	4	1	19	8				
3 2009		FT	39	26	15	14	0	94	59	N/A	8	19	N/A
		PT	4	9	8	4	2	27	16				
4 2008		FT	42	18	13	15	1	89	60	N/A	8	24	N/A
		PT	5	2	7	3	0	17	14		9	15	

FT--full time
PT--part time

(Current Year) Year 2012 → Degrees Awarded Fall 2011-Summer 2012
Year 2011 → Degrees Awarded Fall 2010-Summer 2011
Year 2010 → Degrees Awarded Fall 2009-Summer 2010
Year 2009 → Degrees Awarded Fall 2008-Summer 2009
Year 2008 → Degrees Awarded Fall 2007-Summer 2008

Table D-2. Personnel

Department of Computer Science, Lamar University

Year[1]: Fall 2012

	HEAD COUNT		FTE
	FT	PT	
Administrative[2]	1		1
Faculty (tenure-track)[3]	9		9
Other Faculty (excluding student Assistants)	2		2
Student Teaching Assistants[4]		12	12
Technicians/Specialists	2	6	8
Office/Clerical Employees		1	1
Others[5]			

[1] Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.

[2] Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.

[3] For faculty members, 1 FTE equals what your institution defines as a full-time load.

[4] For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc.

[5] Specify any other category considered appropriate, or leave blank

Signature Attesting to Compliance

By signing below, I attest to the following:

That B.S. in Computer Science has conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET's *Criteria for Accrediting Computing Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual.*

Brenda S. Nichols
Dean, College of Arts & Sciences
Lamar University

Signature

6/27/13

Date