

Supplemental Appendices

ABET Annual Report

for the

B.S. in Computer Science

at

Lamar University

Beaumont, Texas

June 26, 2019

CONFIDENTIAL

The information supplied in this Self-Study Report is for the confidential use of ABET and its authorized agents and will not be disclosed without authorization of the institution concerned, except for summary data not identifiable to a specific institution.

Table of Contents

Note: Appendix A-D are in the Self-Study Report.

Appendix E – Assessment Methodology 2018-2019.....	3
E.1 – Procedures for Direct Measure of Curriculum Outcomes.....	4
E.2 – Procedures for Indirect Measure of Curriculum Outcomes	25
Appendix F – Indirect Measure Assessment Instruments 2018-2019	28
F.1 – Form for Student Evaluations.....	29
F.2 – Form for Exit Interview	31
F.3 – Form for Exit Survey	37
F.4 – Form for Alumni Survey	41
Appendix G – Assessment Results & Analysis 2018-2019.....	46
G.1 – Direct Measure Results and Assessment Analysis 2018-2019	47
G.2 – Direct Measure Results Summary: Curriculum Outcomes 2018-2019	80
G.3 – Indirect Measure Results: Student Evaluation Summary 2018-2019	82
G.4 – Indirect Measure Results: Exit Interview Summary 2018-2019.....	87
G.5 – Indirect Measure Results: Exit Survey Summary 2018-2019.....	89
G.6 – Indirect Measure Results: Alumni Survey Summary 2018-2019	90
G.7 – Indirect Measure Results: Advisory Board Feedback 2018-2019	91
G.8 – Indirect Measure Results: ETS Exams 2018-2019	93
Appendix H – Curriculum Map	95
Appendix I – Department Programming Documentation Standard.....	116
Appendix J – Meeting Minutes 2018-2019	118
Appendix K – Course Schedules 2018-2019	125
Appendix L – Advisement by STARS.....	138
L.1 – Lamar Enrollment Agreement.....	138
L.2 – Advising Communication Timeline – Fall Semester	140
L.3 – Lamar Retention Programs.....	142
L.4 – Tutor Request Form.....	144

Appendix E – Assessment Methodology 2018-2019

Sources of Assessment Data

Direct Measures

1. Rubrics and Test Questions for evaluating direct performance criteria

Indirect Measures

1. Student Evaluation Questions on Course Evaluations: given every semester
2. Exit Interviews of Graduating Seniors: given every semester to graduating seniors in Senior Seminar (COSC 4272).
3. Exit Surveys of Graduating Seniors: given every semester to graduating seniors in Senior Seminar (COSC 4272).
4. Alumni Surveys: given every one or two years
5. Advisory Board Feedback: collected every year
6. Standardized ETS Exams: given every long semester to graduating seniors in Senior Seminar (COSC 4272).

E.1 - Procedures for Direct Measure of Curriculum Outcomes

Department of Computer Science, Lamar University

Summer 2019

Criteria Used to Evaluate Rubrics and Test Questions for Direct Measures

The department will use percentage of students that are adequate or better in 2018-2019. The target is at least 80% out of the students who pass a course meet each performance criterion in 2018-2019. The target will be at least 80% of the students in a course do acceptable work on each performance criterion.

Using the feedback from the indirect measures and the results from our direct measures, the analysis of our assessment findings, actions taken, and recommendations for improvement are presented at the end of these tables for each Curriculum Outcome. In addition to the table below with direct measures, we include in our analysis the following indirect assessment methods: Student Evaluation, Exit Interview, Alumni Survey, and ETS Scores.

Note on Tables Below

* Courses contain material relevant to the performance criteria but are not used in the assessment strategy at this time.

Curriculum Outcome 1 Software Fundamentals

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[1.1] Apply UML interaction diagrams and class diagrams to illustrate object models.	COSC 1336, COSC 1337, COSC 2336, CPSC 4360	Selected Questions on Final Exam	CPSC 4360	Spring and Fall of each year	Dr. Peggy Doerschuk or Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[1.2] Apply important design patterns to OOD.	COSC 3308, CPSC 4360	Selected Questions on Final Exam	CPSC4360	Spring and Fall of each year	Dr. Peggy Doerschuk or Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[1.3] Create useful software architecture documentation.	COSC 2336, COSC 3304, CPSC 4317, CPSC 4302, CPSC 4340 CPSC 4360	Rubric on software architecture documentation on final project	CPSC 4340	Fall of each year	Dr. Kami Makki	Size = Percentage = The target of 80% was _____.
[1.4] Develop correct and efficient programs.	COSC 1336, COSC 1337, COSC 2336, COSC 3304, CPSC 4317, *CPSC 4302, *CPSC 4340 *CPSC 4360	Selected Questions on Assignments	COSC 3304	Spring of each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.
[1.5] Debug implemented software in a proficient	COSC 1336, COSC 1337, COSC 2336	Selected Questions on Assignments	COSC 2336 and COSC 2372	Spring of each year	Dr. L. Osborne	Size = Percentage = The target of

manner.	COSC 2372					80% was _____.
[1.6] Design user interfaces appropriate to a large software system	COSC 1336 COSC 1337 CPSC 4317 CPSC 4360	Rubric	CPSC 4360	Fall and Spring of Each year	Dr. Stefan Andrei and Dr. Peggy Doerschuk	Size = Percentage = The target of 80% was _____.
[1.7] Develop user-level documentation for software	All courses with programming assignments	Rubric	CPSC 4360 and COSC 2336	Fall and Spring each year	Dr. Doerschuk or Dr. Stefan Andrei Dr. Makki	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.1 Computer Science Technology Skills – Discrete Mathematics and Structures

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.1.1] Be able to develop software to support specific operations on frequently used discrete structures such as lists, trees, and graphs.	COSC 2336 COSC 4302 CPSC 4317	Code development on final exams	COSC 2336	Fall and Spring of each year	Dr. Kami Makki and Dr. Zhang	Size = Percentage = The target of 80% was _____.
[2.1.2] Be able to use elementary concepts of combinatorics, probability, and statistics to analyze and evaluate the efficiency of algorithms.	COSC 3304	Selected Questions on Midterm Exam and Final Exam in COSC 3304	COSC 3304	Spring of each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.
[2.1.3] Be able to use concepts of discrete mathematics, automata, and finite state machines to explain the design of computer hardware.	COSC 2336 COSC 2372 COSC 3302	Selected Questions on Final Exam in COSC 3302	COSC 3302	Spring of each year	Dr. Hikyoo Koh	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.2 Computer Technology Skills – Analysis and Design of Algorithms

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.2.1] Demonstrate basic understanding of asymptotic notations and time complexity.	COSC 2336 COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.
[2.2.2] Design efficient algorithms and compare competing designs.	COSC 2336, COSC 3304 CPSC 4360	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.
[2.2.3] Demonstrate basic understanding of some design approaches such as greedy algorithms, dynamic programming and divide-and-conquer.	COSC 2336, COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.
[2.2.4] Demonstrate familiarity with standard searching and sorting algorithms and linear and non-linear structures.	COSC 2336 COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.3 Computer Science Technology Skills – Formal Languages and Computability Theory

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.3.1] Demonstrate basic knowledge of equivalences between various types of languages and corresponding accepting devices including Turing Machines.	COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = Percentage = The target of 80% was _____.
[2.3.2] Demonstrate basic knowledge of practical applicability of various types of grammar and of some standard representation forms.	COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = Percentage = The target of 80% was _____.
[2.3.3] Demonstrate knowledge of limitations of computational capability of computer grammars.	COSC 3308 COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = Percentage = The target of 80% was _____.
[2.3.4] Demonstrate basic knowledge of equivalences and normal forms of	COSC 3308 COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = Percentage = The target of 80% was _____.

logical formulas in propositional logic.	COSC 2375					_____.
[2.3.5] Demonstrate basic understanding and appreciation of the various essential programming languages constructs, paradigms, evaluation criteria, and language implementation issues.	COSC 3308	Exam questions	COSC 3308	Fall Semester	Dr. Andrei	Size = Percentage = The target of 80% was _____.
[2.3.6] Demonstrate basic knowledge and skills in programming techniques with the focus on concepts and not on a particular language.	COSC 3308	Exam questions	COSC 3308	Fall Semester	Dr. Andrei	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.4 Computer Science Technology Skills – Operating Systems

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.4.1] Knows the main components of an operating system and their purposes and modes of interaction.	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[2.4.2] Knows the structure of device drivers and the interaction between device drivers and operating systems.	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[2.4.3] Outlines the basic issues in memory management design and virtual memory	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[2.4.4] Can develop basic system applications based on operating system APIs.	COSC 4302 CPSC 4317	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.5 Computer Science Technology Skills – Database Design

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.5.1] Demonstrate the application of Entity-Relational diagrams to model real world problems.	CPSC 4340	Exam Questions	CPSC 4340	Fall Semester	Dr. Kami Makki	Size = Percentage = The target of 80% was .
[2.5.2] Design relations for real world problems including implementation of normal forms, keys, and semantics constraints for each relation.	CPSC 4340 CPSC 4360	Exam Questions	CPSC 4340	Fall Semester	Dr. Kami Makki	Size = Percentage = The target of 80% was _____.
[2.5.3] Demonstrate competence in implementations of database applications.	CPSC 4340	Rubric for final project	CPSC 4340	Fall Semester	Dr. Kami Makki	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.6 Computer Science Technology Skills – Computer Networks

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.6.1] Employ the socket API to program applications among independent hosts.	CPSC 4317	Exam Questions	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[2.6.2] Explain common network architectures, the services provided by each layer, and the protocols required for connecting peer layers.	CPSC 4317	Exam Questions	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[2.6.3] Evaluate network models through simulation and the use of common performance metrics for networks.	CPSC 4317	Project	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 2.7 Computer Science Technology Skills –Computer Organization and Architecture

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.7.1] Understands modern ISA design principles and employs them to evaluate systems	COSC 2372, COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = Percentage = The target of 80% was _____.
[2.7.2] Know how to measure performance for different computer architectures	COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = Percentage = The target of 80% was _____.
[2.7.3] Demonstrate knowledge of hardware implementation of numbers and arithmetic operations	COSC 2372, COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 3 Scientific Method**

**Graduates will be able to gather requirements, analyze, design and conduct simulations or other computer experiments in order to evaluate and interpret the data.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[3.1] Be able to justify why selected research methods were chosen and state the intended outcomes of the study.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[3.2] Identify steps used in a particular study.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[3.3] Be able to outline and explain the key features of the adopted method.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[3.4] Analyze and interpret collected data based on the adopted method	COSC 2336, CPSC 4317,	Rubric and Project	CPSC 4317 and COSC	Spring and Fall of every	Dr. Jiangjiang Liu and Dr.	Size = Percentage =

and draw appropriate conclusions.	COSC 4310		4310	year	Bo Sun	The target of 80% was .
-----------------------------------	-----------	--	------	------	--------	-------------------------

Curriculum Outcome 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.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[4.1] Demonstrate understanding of evolving computer technology applications.	COSC 1172, COSC 3325	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[4.2] Demonstrate knowledge of positive social impacts including information globalization, E-Commerce, E-learning and new job creation.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4317	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[4.3] Demonstrate knowledge of negative social impacts including internet pornography, privacy violation, health hazards, computer crimes and dehumanization.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4317	Exam Questions	COSC 3325, CPSC 4317	Fall and Spring each year	Dr. Stefan Andrei, Dr. Bo Sun	Size = Percentage = The target of 80% was _____.
[4.4] Demonstrate basic understanding of intellectual property protection via copyright and patent law and fair use exception for copyrighted software.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 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.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[5.1] Know the differences of various philosophical views on ethics such as deontology, utilitarianism, egoism, and relativism.	COSC 3325	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[5.2] Understand the ACM or a similar professional body's code of ethics and principles underlying those ethics.	COSC 3325, CPSC 4360	Exam Questions	CPSC 4360	Fall Spring each year	Dr. Stefan Andrei, Dr. Peggy Doerschuk	Size = Percentage = The target of 80% was _____.
[5.3] Honor the property rights of others including copyrights and patents.	COSC 1172, COSC 3325, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.
[5.4] Demonstrate ability for ethical decision making within the computer profession.	COSC 1172, COSC 3325, CPSC 4317, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was _____.

[5.5] Demonstrate knowledge of factors affecting fair resolution of conflicts of interests.	COSC 1172, COSC 3325, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = Percentage = The target of 80% was
---	---------------------------------------	----------------	-----------	------------------	-------------------	---

Curriculum Outcome 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.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[6.1] Demonstrate the ability to work in heterogeneous environments which are diverse in gender, ethnicity, and academic accomplishment.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Makki, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[6.2] Attend team meetings and contribute towards solution of technical problems during the meetings.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Makki, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[6.3] Make appropriate contributions within their skill set to the completion of the project.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Makki, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[6.4] Demonstrate a sense of interdependence with other team members.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Makki, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 7 Oral Communications**

**Graduates will demonstrate their ability to verbally communicate clearly.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[7.1] Demonstrate the ability to communicate in a given situation.	COSC 3325, COSC 4172, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = Percentage = The target of 80% was _____.
[7.2] Demonstrate the ability to comprehend what is said and to show an appreciation of the importance of listening.	COSC 3325, COSC 4172, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = Percentage = The target of 80% was _____.
[7.3] Communicate clearly at the level of the audience the technical material intrinsic to the discipline of computer science.	COSC 3325, COSC 4172, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = Percentage = The target of 80% was _____.
[7.4] Demonstrate knowledge of the communication process.	COSC 3325, COSC 4172, COSC 1172	Rubrics	COSC 3325, COSC 4272 CPSC 4360	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = Percentage = The target of 80% was _____.

Curriculum Outcome 8 Written Communication Skills**

**Graduates will demonstrate their ability to write effectively both technical and non-technical materials with appropriate multimedia aids.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[8.1] Provide an introduction that grabs the attention of readers.	COSC 1172, COSC 3325, COSC 4172, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[8.2] Organize documents in terms of a few main points or themes.	COSC 1172, COSC 3325, COSC 4172, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[8.3] Choose appropriate illustrations, examples, or evidence to support the written documents.	COSC 1172, COSC 3325, COSC 4172, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[8.4] Write appropriately for specified readers in terms of technical content.	COSC 1172, COSC 3325, COSC 4172, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.
[8.5] Write organized, grammatically correct reports.	COSC 1172, COSC 3325, COSC 4172, CPSC 4360,	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = Percentage = The target of 80% was _____.

	COSC 4302					
--	-----------	--	--	--	--	--

Curriculum Outcome 9 Continuing Education and Lifelong Learning**

**Graduates will be demonstrate that they can independently acquire new computing related skills and knowledge in order to pursue either further formal or informal learning after graduation.

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[9.1] Be able to search scholarly publications to assist in resolving problems.	COSC 3325, COSC 4172, COSC 4302, CPSC 4360	Rubrics	COSC 3325 and COSC 4272	Fall and Spring	Dr. Andrei	Size = Percentage = The target of 80% was _____.
[9.2] Intend to engage in additional formal education or participate in employer-related training or research projects.	COSC 4272	Rubrics	COSC 4272	Fall and Spring	Dr. Andrei	Size = Percentage = The target of 80% was _____.
[9.3] Independent study. Participate in Honors program or in undergraduate research at Lamar. This could be done in the STAIRSTEP Program, Presentations or Posters at Professional Conferences, COOP or Internship position reports. Student could own a software design and development company.	COSC 4272	Rubrics	COSC 4272	Fall and Spring	Dr. Andrei	Size = Percentage = The target of 80% was _____.

E.2 - Procedures for Indirect Measure of Curriculum Outcomes

Sources of Data for Evaluations for Each Curriculum Outcome
Assessment Committee Approved Spring 2013 (Revised Summer 2019)

Curriculum Outcome	Course Evaluations	Student Evaluation Questions (Done every semester)	Exit Interview Questions (Done every semester by graduating seniors)	Exit Survey Questions (Done every semester by graduating seniors)	Alumni Survey Questions (Partial surveys every two years)	ETS Scores
1	COSC 1336 COSC 1337 COSC 2336 COSC 2372 COSC 3304 CPSC 4317 COSC 4272 COSC 4302 CPSC 4340 CPSC 4360	27, 28, 29, 31 27-31 27,28,30,31,32,38 27,28,30,31,32 27-32 27,28,30,38 27 25,27,28,30,31 25,27-31 25,27-32	1,2,3,6,12		1,2,3,6,12	Overall Average Score and 3 Assessment Indicators (Programming, Computer Organization, Algorithms and Theory)
2			15		15	The 3 Assessment Indicators (Programming, Computer Organization, Algorithms and Theory)
2.1	COSC 2336	27, 28,29,30,31,40				
	COSC 3304	27,37,40				

	COSC 3302	27,39,40				
2.2	COSC 3304	27,28,33,34,39,40				
2.3	COSC 3302	39,40				
2.4	COSC 4302	27,28,35,39,40				
2.5	CPSC 4340	27,28,39,40				
2.6	CPSC 4317	28,30,38,39,40				
2.7	COSC 2372	27,31,35,40				
	COSC 4310	35,38,40				
3	COSC 2336 CPSC 4317 COSC 4310	37,38,40 37,38,40 35,37,38,40	3,4,6,7		3,4,6,7	
4	COSC 1172 COSC 3325 CPSC 4360	41 41 41	5,9		5,9	
5	COSC 3325	36	9	16	9	
6	COSC 4302 CPSC 4340 CPSC 4360	25,26,34,35 25,26,34,35 25,26,34	4,7,8,11,13,14		4,7,8,11,13,14	
7	COSC 3325 CPSC 4360	34,42 25,26,34	8,13,14	13	8,13,14	
8	COSC 1172 COSC 3325 COSC 4302 CPSC 4360	42 26,34 26,34	8,13,14	12	8,13,14	
9	COSC 3325 COSC 4272	42 27,34,35,40,42	1,10,11	9,11	1,10,11	Overall Average Score

Note: An Exit Survey that is anonymous is also given to students in COSC 4272 (Senior Seminar). It is concerned mainly with overall program issues such as scheduling, cognate courses, advising, and satisfaction with opportunities for independent study.

Criteria for Satisfactory Performance

On Course Student Evaluations: average for each course/semester ≥ 3.75

On Exit Interview Form: average for each question/year ≥ 3.75

On Exit Interview Form: average for each of the overall quality questions/year ≥ 7.5 /year

On Exit Survey Form: questions 1-18 ≥ 3.75 /year except for question 3 where the goal is between 2.25 and 4.00/year.

On Alumni Survey: average on each curriculum question ≥ 4.0

On Alumni Survey: average for each of the overall quality questions/year ≥ 8.0

ETS questions: Mean on each assessment indicator each semester ≥ 50.0 ; overall average/semester ≥ 160 with minimum ≥ 140 .

Other Sources of Indirect Data

1. Input from our Industrial Advisory Board

Criteria Used to Evaluate Indirect Data

If average score \geq our target criteria, then performance criteria is met

Else if $5 \leq$ sample size < 10 , then monitor performance criteria for next two semesters

Else if sample size < 5 , then the curriculum remains the same, but we will gather data for the next two cycles to produce a larger sample for analysis.

Else criteria is not met.

Appendix F – Indirect Measure Assessment Instruments 2018-2019

This appendix includes assessment instruments used for indirect measures. Please note that alumni surveys are typically only solicited every 2 years. The following instruments are included:

1. Student Evaluations
2. Exit Interview
3. Exit Survey
4. Alumni Survey

F.1 - Form for Student Evaluations

	Undergraduate Online Course Assessment Form Course Name: _____	Major _____ Date _____ Course Number _____				
Question Number (University Online Evaluation Question Number:)	Student Assessment of Program Outcomes Note: Not all of the topics listed below are covered in any class. Hence, it does not make sense for all of your answers to be the same. It is perfectly reasonable that some of your answers should be “strongly disagree.” This course provided you	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1 (25)	the opportunity to work effectively as a member of a software development team.	1	2	3	4	5
2 (26)	the knowledge to employ effective teamwork and interpersonal communication skills.	1	2	3	4	5
3 (27)	the knowledge to analyze a software development problem and design a software solution.	1	2	3	4	5
4 (28)	the ability to implement a software design specification in an appropriate development environment.	1	2	3	4	5
5 (29)	the ability to apply appropriate user interface design.	1	2	3	4	5
6 (30)	the knowledge to design and apply relevant software testing procedures.	1	2	3	4	5
7 (31)	instruction on the proper documentation of source code.	1	2	3	4	5
8 (32)	the knowledge needed to develop user-level documentation for software.	1	2	3	4	5
9 (33)	the ability to independently acquire new computing related skills (e.g. new computing environment, new programming language).	1	2	3	4	5
10 (34)	the ability to communicate technical design and implementation concepts to computing professionals as well as to non-computing personnel, both orally and in writing.	1	2	3	4	5
11 (35)	the knowledge to evaluate hardware and software in the context of integrating computing into an environment or defining a computing solution to a particular problem or situation.	1	2	3	4	5
12 (36)	the knowledge to conduct yourself in an ethical and professional manner and to assume a leadership role in class projects.	1	2	3	4	5
13 (37)	the ability to apply knowledge from computer science and other disciplines to solve computer science problems.	1	2	3	4	5
14 (38)	the knowledge to design and conduct simulation or other computer experiments and analyze and interpret data.	1	2	3	4	5
15 (39)	with a firm theoretical foundation for the subject of the course.	1	2	3	4	5
16 (40)	the knowledge to acquire the required skills in the use of the tools and technology of computer science.	1	2	3	4	5
17 (41)	the ability to obtain and use information about the local					

	and global impact of the field on relevant societal issues.	1	2	3	4	5
18 (42)	with motivation to establish habits of life-long learning and curiosity.	1	2	3	4	5
	Student Assessment of Instruction	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
19	Instructor seemed to have a thorough understanding of subject matter.	1	2	3	4	5
20	Instructor was able to answer student questions effectively.	1	2	3	4	5
21	Instructor made contributions not in assigned material.	1	2	3	4	5
22	Instructor treats all students equally.	1	2	3	4	5
23	Instructor had a reasonable grading system.	1	2	3	4	5
24	Instructor made grading system clear to student.	1	2	3	4	5
25	Instructor was available to students online.	1	2	3	4	5
26	Instructor gave tests that adequately evaluated the understanding of the course material.	1	2	3	4	5
27	Instructor made reasonable assignments.	1	2	3	4	5
28	Instructor returned tests and papers in a reasonable time.	1	2	3	4	5
29	Instructor made the course interesting.	1	2	3	4	5
31	Instructor was able to present concepts so they were understood.	1	2	3	4	5
32	Instructor presented lectures that were carefully planned and were helpful.	1	2	3	4	5
33	Taking this instructor's course was worthwhile.	1	2	3	4	5
	Student Information					
34	What grade did you expect to receive in this course?	F	D	C	B	A
35	What is your grade range in this course?	DF	CD	BC	AB	
36	What is the average number of hours per week you spent on this course?	<2	2 to 7	7 to 12	>12	
37	If you dropped or do not pass this course, would you consider taking the course from the same instructor again?	No	Yes			
38	Would you recommend the instructor to a friend who is considering taking this course?	No	Yes			
39	Please assign an overall rating to the instructor based on a scale from A (excellent) to E (very poor).	F	D	C	B	A
	Comments Section					
	Number of Tests given?					
	Number of assignments assigned?					

F.2 - Form for Exit Interview

Department of Computer Science Exit Interview Form UNDERGRADUATE

Please print clearly.

Date: _____

Name: _____

Permanent Address: _____

_____ City _____ State _____ Zip

Check your degree program: B.S. in Computer Science B.S. in Computer Information Science

If you took the SAT test in high school, what was your total score: _____

What was the most important reason for your coming to Lamar University rather than another university?

Check: I have have not found a position yet.

If you have found a position, what is the name of the company, and where is the company located?

If you have found a position, what is your job title? _____

If you have found a position, what is the starting salary of your new position? _____

On the average, how many hours per week have you been employed during the time when you were enrolled in courses during the last two years before graduation? _____

From what high school did you graduate? _____

What year? _____

If outside the local area, what was the city and state? _____

How many years have passed since the time you first enrolled at Lamar and the time when you will be graduating? _____

Exit Interview Questions

Questions concerning the Quality of the Program in the Computer Science Department.

- _____ 1. On a scale of one to ten (with 10 being good), how do you rate the quality of the courses taken within the department?
- _____ 2. On a scale of one to ten, how do you rate the quality of instruction in computer science courses?
- _____ 3. On a scale of one to ten (with 10 being easy and 1 being hard), how do you rate the ease of scheduling courses in computer science?
- _____ 4. On a scale of one to ten (with 10 being very satisfied and 1 being not satisfied at all), how do you rate your overall satisfaction with the program you are graduating in?

Department of Computer Science Objectives		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	Your education required you to apply critical thinking to solving difficult problems.	1	2	3	4	5
2.	Your education ensured that you can design software solutions to different types of problems.	1	2	3	4	5
3.	Your education provided a firm theoretical foundation so that you were prepared for future scientific advances.	1	2	3	4	5
4.	Your education stimulated an understanding of the role of computer science in interdisciplinary studies, and it increased your interest and abilities in other areas.	1	2	3	4	5
5.	Your education fostered an understanding of the impact of the discipline on relevant local and global social issues.	1	2	3	4	5
6.	Your education enabled you to develop the ability to analyze and solve computer science problems by applying knowledge from computer science, mathematics, and software engineering.	1	2	3	4	5
7.	Your education offered the preparation necessary to design and conduct simulations or other experiments and analyze and interpret data.	1	2	3	4	5
8.	Your education developed in you skill in communication and cooperation within workgroups.	1	2	3	4	5
9.	Your education fostered an awareness of professional and ethical responsibilities and their application in real situations.	1	2	3	4	5
10.	Your education established an understanding of the need for life-long education and curiosity.	1	2	3	4	5
11.	Your education in the CS Department occurred in an environment that facilitated and encouraged learning.	1	2	3	4	5

12.	Your education enabled you to understand the process of software development including specifications, analysis, design, and testing.	1	2	3	4	5
13.	Your education provided a sufficient educational foundation for leadership roles along future career paths.	1	2	3	4	5
14.	Your education gave you the ability to recognize and value diversity in the world and in intellectual areas.	1	2	3	4	5
15.	Your education gave you a strong background in the fundamental technical areas of computer architecture, algorithms, operating systems, database systems, and formal languages.	1	2	3	4	5

Please give your opinion concerning the strengths of your degree program?

Please give suggestions for improvement to your degree program?

Questions Concerning Your Experiences at Lamar.

Have you received any awards from the Department, College or University since you have been at Lamar? If you have, please list them.

Have you used the services of the Career Center since coming to Yes No
Lamar?

If you have, what help did the Career Center provide?

How many group projects do you think you did in computer science courses? _____

How many presentations did you make in computer science courses? _____

Did you present any course projects outside the classroom at:

Regional Student Conference Yes No

Civic Group (i.e. Chamber of Commerce) Yes No

Professional Conference sponsored by the ACM or IEEE Yes No

Other: _____

Did you participate regularly in ACM? Yes No

What factors caused you to participate or not participate regularly in ACM?

Did you participate in UPE? Yes No

Did you receive any scholarships? Yes No If so, what were the sources of the funds?

If you received any scholarships, what was the total amount you received over the course of time you studied at Lamar? _____

If you received any scholarships, did the money you receive determine your decision to come to Lamar and study Computer Science? Yes No

What were your favorite CS/CIS/ELEN courses? _____

Reasons for selections? _____

What were your least favorite CS/CIS/ELEN courses? _____

Reasons for selections? _____

Who were your favorite CS/CIS/ELEN instructors? _____

Reasons for selections? _____

Who were your least favorite CS/CIS/ELEN instructors? _____

Reasons for selections? _____

What were your favorite Math and/or Physics courses? _____

Reasons for selections? _____

What were your least favorite Math and/or Physics courses? _____

Reasons for selections? _____

F.3 - Form for Exit Survey

Computing Sciences Department Exit Survey Undergraduate Students

_____ Academic Year

The following information is being collected as part of our on-going self-evaluation. This survey is designed for graduating Computer Science and Computer Information Systems majors for the purpose of obtaining feedback from students with the goal of improving our courses and degree programs. Your responses to this survey will remain anonymous. Results will be analyzed and reported in terms of group statistics and collected comments. Do *not* place your name on the form.

MAJOR:

Computer Information
Systems: _____

Computer Science: _____

Approximate overall
GPA: _____

Approximate GPA in Computer
Science: _____

For each statement that follows, please indicate your level of agreement. Space is provided for your comments that explain or clarify your answer. Use backs of sheets to continue comments (label by question number). While we are principally interested in the courses in the major and cognate, you may add comments on other courses at the university if you wish but please make clear to which courses you are referring.

1. I have learned a great deal in my major.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

2. I am well prepared for employment in my major.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

3. The work required for my major was:

Too Difficult Difficult Reasonable Easy Too Easy

Comment:

- 4. Faculty is readily available for assistance on course work.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

- 5. The quality of teaching in the major is good.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment: (Name Courses)

- 6. The computer labs that support the program are satisfactory for that purpose.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

- 7. Departmental academic advisors were readily available for help and met my needs.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

- 8. Scheduling is easy because of the availability of courses.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

- 9. Independent study opportunities are satisfactory.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

- 10. Classrooms are adequate to support the program.**
 Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

11. I can analyze, design and implement a computerized solution to a “real life” problem.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment: (Name Courses)

12. I can write technical documents such as specifications, design and users’ manuals in a specified format.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment: (Name Courses)

13. I can orally present a computerized project.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment: (Name Courses)

14. I am prepared to enter a graduate program.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

15. I have a good general background in Computer Science.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment: (Name Courses)

16. I am cognizant of ethical issues and societal concerns relating to computers in society.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

17. I have a deep understanding of at least one sub-area of Computer Science.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

18. I have the ability to analyze sophisticated algorithms and recognize variations of known problems.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

19. I have a command of the material covered in the five core courses (Algorithms, Advanced Operating Systems, Software Engineering, Networking, and Foundations of Computer Science).

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

20. I have the ability to design and implement computer programs of large size and advanced complexity with limited guidance.

Strongly Disagree Disagree Not Sure Agree Strongly Agree

Comment:

21. What did you like best about the major?

22. What did you like least about the major?

23. What would you recommend to improve the advising system?

F.4 - Form for Alumni Survey

Computer Science Department

Alumni Survey

1. Name _____ Date _____
(If female, please provide maiden name in addition to married name)

What degree(s) did you earn in the Computer Science Department at Lamar University? _____

Please give at least one address through which we might best be able to reach you in the future. For unmarried students, this will probably be the address of your parent(s) or guardian.

Permanent Home Address:

Present Address:

Phone Number: _____

Email Address: _____

Year of Graduation: _____

Degree(s) Received from Lamar:

↑ B.S. in Computer
Science

↑ B.S. in Computer and
Information
Sciences

↑ M.S. in Computer
Science

2. If you are employed, please provide the following:

Name of your company: _____

Your title: _____

Address of Employer: _____

Salary: † Less than \$40,000	100,000\$ - 80,000\$ †
60,000\$ - 40,000\$ †	200,000\$ - 100,000\$ †
80,000\$ - 60,000\$ †	† More than \$200,000

3. I rate the quality of the courses taken in the CS department as:

Poor										
Excellent	_____									
0	1	2	3	4	5	6	7	8	9	
10										

4. I rate the quality of instruction in the program as:

Poor										
Excellent	_____									
0	1	2	3	4	5	6	7	8	9	
10										

5. Scheduling of needed courses was:

	Very Difficult					Reasonable				
Easy	_____									
0	1	2	3	4	5	6	7	8	9	
10										

6. Overall I am satisfied with the program:

	Not at All					Somewhat					
	Very	_____									
0	1	2	3	4	5	6	7	8	9		
10											

7. Department of Computer Science Objectives

		Strongly Strongly Disagree	Disagree	Undecided	Agree
1.	Your education required you to apply critical thinking to solving difficult problems.	1	2	3	4
		5			
2.	Your education ensured that you can design software solutions to a wide range of problems.	1	2	3	4
		5			
3.	Your education provided a firm theoretical foundation so that you were prepared for future scientific advances.	1	2	3	4
		5			

4.	Your education stimulated an understanding of the role of computer science in interdisciplinary studies, and it increased your interest and abilities in other areas.	5	1	2	3	4	
5.	Your education fostered an understanding the impact of the discipline on relevant social issues.	5	1	2	3	4	
6.	Your education enabled you to develop the ability to analyze and solve computer science problems by applying knowledge from computer science, mathematics, and software engineering.	5	1	2	3	4	
7.	Your education offered the preparation necessary to design and conduct simulations or other experiments and analyze and interpret data.	5	1	2	3	4	
8.	Your education developed in you skill in communication and cooperation within workgroups and larger organizations	5	1	2	3	4	
9.	Your education fostered an awareness of professional and ethical responsibilities and their application in real situations.	5	1	2	3	4	
10.	Your education established an understanding of the need for life-long education and curiosity.	5	1	2	3	4	
11.	Your education in the CS department occurred in an environment that facilitated and encouraged learning.	5	1	2	3	4	
12.	Your education enabled you to understand the process of software development including specifications, analysis, design, and testing.	5	1	2	3	4	
13.	Your education provided a sufficient educational foundation for leadership roles along future career paths.	5	1	2	3	4	
14.	Your education gave you the ability to recognize and value diversity in the world and in intellectual areas.	5	1	2	3	4	
15.	Your education has prepared you, in your opinion, for graduate study in Computer Science		1	2	3	4	5
16.	Your education gave you a strong background in the fundamental technical areas of computer architecture, algorithms, operating systems, database systems, and formal languages.		1	2	3	4	5

Please comment on what you think are the strengths of the CS program:

During your job interviews, did the interviewers offer any comments that suggested areas where they felt our degree was especially weak of especially strong? Were there topics they asked you about with which you were unfamiliar?

10. In what ACM/IEEE activities did you participate? _____

11. Age at graduation? _____ Married? _____ Gender? _____ Ethnicity? _____

12. Were you a transfer student? _____ If so, how many hours transferred
toward the degree? _____

13. Were you a co-op or intern student? _____ How many semesters? _____

Company Name: _____

Address: _____

14. Have you gone to graduate school after leaving Lamar? _____

If yes, what school(s) did you attend and what degree(s) did you earn?

15. What courses were most valuable to you at Lamar in computer science?

16. What courses were least valuable to you at Lamar in computer science?

17. What suggestions do you have for preparing today's students for a career in computer science?

Thank you for taking the time from your busy schedule to complete this form. The information you have given will never become public. We do use the information gathered from Alumni in this form to improve our degree programs.

Please Return Completed Form to:

**Computer Science Department
Lamar University
P.O. Box 10056
Beaumont, TX 77710**

**Or by email to paula.gregory@lamar.edu
and/or stefan.andrei@lamar.edu**

Appendix G – Assessment Results & Analysis 2018-2019

This appendix includes results and analysis of assessment for the 2018-2019 academic year (which includes the fall 2018 and spring 2019 long semesters). The following are included:

1. Direct Measure Results and Assessment Analysis 2018-2019
2. Direct Measure Results Summary: Curriculum Outcomes 2018-2019
3. Indirect Measure: Student Evaluation Summary 2018-2019
4. Indirect Measure: Exit Interview Summary 2018-2019
5. Indirect Measure: Exit Survey Summary 2018-2019
6. Indirect Measure: Alumni Survey Summary 2018-2019
7. Indirect Measure: Advisory Board Feedback 2018-2019
8. ETS Exams 2018-2019

G.1 – Direct Measure Results and Assessment Analysis 2018-2019

Department of Computer Science, Lamar University
Summer 2019

Using the feedback from the indirect measures specified in Appendices E.1 and the results from our direct measures, the analysis of our assessment findings, actions taken, and recommendations for improvement are presented in this document. Note that the selected questions used on final examinations for each performance criterion are submitted by the faculty and approved by the departmental Assessment Committee to ensure adequate appropriate depth and consistency of content across time.

Assessment and Evaluation

Curriculum Outcome 1 Software Fundamentals

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[1.1] Apply UML interaction diagrams and class diagrams to illustrate object models.	COSC 1336, COSC 1337, COSC 2336, CPSC 4360	Selected Questions on Final Exam	CPSC 4360	Spring and Fall of each year	Dr. Peggy Doerschuk or Dr. Stefan Andrei	Size = 33 Percentage = 86.42 The target of 80% was Met
[1.2] Apply important design patterns to OOD.	COSC 3308, CPSC 4360	Selected Questions on Final Exam	CPSC4360	Spring and Fall of each year	Dr. Peggy Doerschuk or Dr. Stefan Andrei	Size = 33 Percentage = 83.39 The target of 80% was Met
[1.3] Create useful software architecture documentation.	COSC 2336, COSC 3304, CPSC 4317, CPSC 4302, CPSC 4340, CPSC 4360	Rubric on software architecture documentation on final project	CPSC 4340	Fall of each year	Dr. Kami Makki	Size = 26 Percentage = 81 The target of 80% was Met
[1.4] Develop correct and efficient programs.	COSC 1336, COSC 1337, COSC 2336, COSC 3304,	Selected Questions on Assignments	COSC 3304	Spring of each year	Dr. L. Osborne	Size = 78 Percentage = 91 The target of

	CPSC 4317, *CPSC 4302, *CPSC 4340 *CPSC 4360					80% was Met
[1.5] Debug implemented software in a proficient manner.	COSC 1336, COSC 1337, COSC 2336 COSC 2372	Selected Questions on Assignments	COSC 2336 and COSC 2372	Spring of each year	Dr. L. Osborne	Size = 99 Percentage = 86.17 The target of 80% was Met
[1.6] Design user interfaces appropriate to a large software system	COSC 1336 COSC 1337 CPSC 4317 CPSC 4360	Rubric	CPSC 4360	Fall and Spring of Each year	Dr. Stefan Andrei and Dr. Peggy Doerschuk	Size = 33 Percentage = 89.81 The target of 80% was Met
[1.7] Develop user-level documentation for software	All courses with programming assignments	Rubric	CPSC 4360 and COSC 2336	Fall and Spring each year	Dr. Doerschuk or Dr. Stefan Andrei Dr. Makki	Size = 62 Percentage = 85.16 The target of 80% was Met

* Courses contain material relevant to the performance criteria but are not used in the assessment strategy at this time.

Date: May 31, 2019

Results: All direct measure targets were met. This was similar to last year when all targets were met. Indirect measure targets were similar to last year with the exception that in course evaluations all indirect measure targets for COSC 2336 were not met as compared to last year when all were met in COSC 2336. However, all of those scores were greater than 3.0 out of 5.0. We will bring this to the attention of the instructors who teach COSC 2336. also showed an improvement this year as compared to last year. Last year 37 of

47 targets were met for course evaluation questions. This year 24 of 47 were met – a decrease of 13. Also, all targets were met for this outcome in exit interviews.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 2.1 Computer Science Technology Skills – Discrete Mathematics and Structures

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.1.1] Be able to develop software to support specific operations on frequently used discrete structures such as lists, trees, and graphs.	COSC 2336, COSC 4302, CPSC 4317	Code development on final exams	COSC 2336	Fall and Spring of each year	Dr. Kami Makki and Dr. Zhang	Size = 36 Percentage = 96.88 The target of 80% was Met
[2.1.2] Be able to use elementary concepts of combinatorics, probability, and statistics to analyze and evaluate the efficiency of algorithms.	COSC 3304	Selected Questions on Midterm Exam and Final Exam in COSC 3304	COSC 3304	Spring of each year	Dr. L. Osborne	Size = 78 Percentage = 82 The target of 80% was Met
[2.1.3] Be able to use concepts of discrete mathematics, automata, and finite state machines to explain the design of computer hardware.	COSC 2336, COSC 2372, COSC 3302	Selected Questions on Final Exam in COSC 3302	COSC 3302	Spring of each year	Dr. Hikyoo Koh	Size = 44 Percentage = 85 The target of 80% was Met

Date: May 31, 2019

Results: All direct measure targets were met this year as compared to last year when we did not meet criteria 2.1.2. For indirect measures, last year we met all targets but this year we did not meet the targets for course evaluation questions in COSC 2336 and COSC 3304. However, the scores were very close to the targets of 3.75 out of 5.0 except questions 29 and 32. Those two questions are related to knowledge we expect students to learn later in the program so this was not a big concern at this point in the sophomore (COSC 2336) and junior (COSC 3304) courses.

Actions: None.

Second Cycle Results: Last year we discussed with the instructor of COSC 3304 the fact we did not meet the direct measure target for criteria 2.1.2. It appears that discussion was productive since we met that direct target this year.

Curriculum Outcome 2.2 Computer Technology Skills – Analysis and Design of Algorithms

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.2.1] Demonstrate basic understanding of asymptotic notations and time complexity.	COSC 2336 COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = 78 Percentage = 82 The target of 80% was Met
[2.2.2] Design efficient algorithms and compare competing designs.	COSC 2336 COSC 3304 CPSC 4360	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = 78 Percentage = 82 The target of 80% was Met
[2.2.3] Demonstrate basic understanding of some design approaches such as greedy algorithms, dynamic programming and divide-and-conquer.	COSC 2336 COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = 78 Percentage = 82 The target of 80% was Met
[2.2.4] Demonstrate familiarity with standard searching and sorting algorithms and linear and non-linear structures.	COSC 2336 COSC 3304	Questions from Midterm Exam	COSC 3304	Spring each year	Dr. L. Osborne	Size = 78 Percentage = 82 The target of 80% was

						Met
--	--	--	--	--	--	-----

Date: May 31, 2019

Results: This year we met all 4 targets for direct measures criteria compared to last year when we did not any of the 4. In indirect measures, this year only 2 targets for course evaluations were not met by small margin: 3.65 and 3.68 (the targets were 3.75). Last year we met the targets for all course evaluations at 3.9 each for all 4 questions related to this outcome on the course evaluations. Overall, this was a big improvement from last year. We also note there was a much larger sample size this year (78 students compared to 14 for direct measures).

Actions: None.

Second Cycle Results: Last year we asked the instructor in COSC 3304 to review and adjust the final exam as needed, based on the most recent textbook and lecture materials. We also asked the instructor to add additional coursework to the course. It appears these adjustments produced the desired result since we see an improvement.

Curriculum Outcome 2.3 Computer Science Technology Skills – Formal Languages and Computability Theory

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.3.1] Demonstrate basic knowledge of equivalences between various types of languages and corresponding accepting devices including Turing Machines.	COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = 44 Percentage = 82 The target of 80% was Met
[2.3.2] Demonstrate basic knowledge of practical applicability of various types of grammar and of some standard representation forms.	COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = 44 Percentage = 85 The target of 80% was Met
[2.3.3] Demonstrate knowledge of limitations of computational capability of computer grammars.	COSC 3308 COSC 3302	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = 44 Percentage = 84 The target of 80% was Met
[2.3.4] Demonstrate basic knowledge of equivalences and normal forms of logical formulas in propositional logic.	COSC 3308 COSC 3302 COSC 2375	Exam questions	COSC 3302	Spring Semester	Dr. Hikyoo Koh	Size = 44 Percentage = 81 The target of 80% was Met
[2.3.5] Demonstrate basic understanding and appreciation of the various essential	COSC 3308	Exam questions	COSC 3308	Fall Semester	Dr. Andrei	Size = 22 Percentage = 86

programming languages constructs, paradigms, evaluation criteria, and language implementation issues.						The target of 80% was Met
[2.3.6] Demonstrate basic knowledge and skills in programming techniques with the focus on concepts and not on a particular language.	COSC 3308	Exam questions	COSC 3308	Fall Semester	Dr. Andrei	Size = 22 Percentage = 84 The target of 80% was Met

Date: May 31, 2019

Results: This year all direct measure targets were met which is the same as last year when all were met. including the criteria 2.3.4 which was not met with a sample size of 7 last year. This was an improvement from last year. Indirect measure targets also showed an improvement this year as compared to last year. Last year targets for both of the two questions on student evaluation surveys were met. This year one was not met – question 39 in COSC 3302.

Actions: We will ask the person responsible for administering course evaluations to revise question 39 since it was incorrectly worded on the course evaluations this year. The new wording will be “The knowledge of a firm theoretical...”. What was missing from the question was “The knowledge of a” and so the question appeared unclear.

Second Cycle Results: None

Curriculum Outcome 2.4 Computer Science Technology Skills – Operating Systems

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.4.1] Knows the main components of an operating system and their purposes and modes of interaction.	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = 30 Percentage = 89.70 The target of 80% was Met
[2.4.2] Knows the structure of device drivers and the interaction between device drivers and operating systems.	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = 30 Percentage = 86.70 The target of 80% was Met
[2.4.3] Outlines the basic issues in memory management design and virtual memory	COSC 4302	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = 30 Percentage = 86.70 The target of 80% was Met
[2.4.4] Can develop basic system applications based on operating system APIs.	COSC 4302 CPSC 4317	Exam Questions	COSC 4302	Fall and Spring Semesters	Dr. Bo Sun	Size = 30 Percentage = 82.90 The target of 80% was Met

Date: May 31, 2019

Results: All the direct measure targets were met for this outcome with a sample size of 13. All performance targets were met for indirect results this year except question 35 on the course evaluation for COSC 4302 although the score for that question was very close to the target of 3.75 at 3.74. Targets for exit interviews and exit surveys were all met.

Actions: None.

Second Cycle Results: None

Curriculum Outcome 2.5 Computer Science Technology Skills – Database Design

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.5.1] Demonstrate the application of Entity-Relational diagrams to model real world problems.	CPSC 4340	Exam Questions	CPSC 4340	Fall Semester	Dr. Kami Makki	Size =35 Percentage = 83.05 The target of 80% was Met
[2.5.2] Design relations for real world problems including implementation of normal forms, keys, and semantics constraints for each relation.	CPSC 4340 CPSC 4360	Exam Questions	CPSC 4340	Fall Semester	Dr. Kami Makki	Size = 35 Percentage = 83.05 The target of 80% was Met
[2.5.3] Demonstrate competence in implementations of database applications.	CPSC 4340	Rubric for final project	CPSC 4340	Fall Semester	Dr. Kami Makki	Size = 35 Percentage = 83.05 The target of 80% was Met

Date: May 31, 2019

Results: All the direct measure targets were met for this outcome with a sample size of 35. All data for the indirect measure targets were also met.

Actions: None.

Second Cycle Results: This year we collected data for indirect measure targets unlike last year in which we did not due to the hurricane.

Curriculum Outcome 2.6 Computer Science Technology Skills – Computer Networks

Indirect Assessment Methods:

Student Evaluation

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.6.1] Employ the socket API to program applications among independent hosts.	CPSC 4317	Exam Questions	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = 16 Percentage = 87.68 The target of 80% was Met
[2.6.2] Explain common network architectures, the services provided by each layer, and the protocols required for connecting peer layers.	CPSC 4317	Exam Questions	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = 16 Percentage = 81,12 The target of 80% was Met
[2.6.3] Evaluate network models through simulation and the use of common performance metrics for networks.	CPSC 4317	Project	CPSC 4317	Fall Semester	Dr. Bo Sun	Size = 16 Percentage = 81.12 The target of 80% was Met

Date: May 31, 2019

Results: This year all direct measure targets were met unlike last year when criteria 2.6.2 and 2.6.3 were not met. The sample size this year was slightly larger at 16 compared to 14 last year. All indirect measure results from CPSC 4317 Student Course Evaluation were not met except for question 40, slightly worse than last year, although the scores were very close to the targets of 3.75 (3.4, 3.6,

3.7 and 3.7). We did not have indirect data last year for this outcome due to a problem with questions not appearing on the student evaluations – a problem we corrected this year.

Actions: We will remove question 30 from the course evaluation of CPSC 4317 because the concept asked about in the question is not taught in that course (software testing procedures).

Second Cycle Results: Last year we decided to make COSC 4302 Operating Systems a co/pre-requisite for CPSC 4317 Networking and we expected to see improvement in direct measures. Apparently, this was effective since there was an improvement in direct measures.

Curriculum Outcome 2.7 Computer Science Technology Skills –Computer Organization and Architecture

Indirect Assessment Methods: Student Evaluation

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[2.7.1] Understands modern ISA design principles and employs them to evaluate systems	COSC 2372, COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = 20 Percentage = 60 The target of 80% was Not Met
[2.7.2] Know how to measure performance for different computer architectures	COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = 20 Percentage = 70 The target of 80% was Not Met
[2.7.3] Demonstrate knowledge of hardware implementation of numbers and arithmetic operations	COSC 2372, COSC 4310	Local Exam Question	COSC 4310	Spring and Fall semesters	Dr. Jiangjiang Liu	Size = 20 Percentage = 90 The target of 80% was Met

Date: May 31, 2019

Results: This year we did not meet the targets for direct measures criteria 2.7.1 (60/100%) and 2.7.2 (70/100%). Last year we met all these direct measure targets at 100% for all 3 criteria. Indirect measures improved this year as compared to last year although targets for course evaluations in COSC 2372 were low and did not meet targets.

For Outcome 2.7 Performance Criteria 2.7.1 60% (<80%) in 2018-2019 and 100% (>80%) in 2017-2018. The performance criteria 2.7.1 is "Understand modern ISA design principles and employs them to evaluate systems." The assessment results are based on three questions on the final exam where the students were asked to explain instruction implementation and execution.

For Outcome 2.7 Performance Criteria 2.7.2 70% (<80%) in 2018-2019 and 100% (>80%) in 2017-2018. The performance criteria 2.7.2 is "Know how to measure performance for different computer architectures." The assessment results are based on two questions on the final exam where the students were asked to measure performance for different computer architectures.

Actions: The instructor will adjust some questions on the final exam in COSC 4310. We will inform the instructor of COSC 2372 that indirect measure targets were not met in course evaluations for COSC 2372.

Second Cycle Results: None.

Curriculum Outcome 3 Scientific Method**

**Graduates will be able to gather requirements, analyze, design and conduct simulations or other computer experiments in order to evaluate and interpret the data.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[3.1] Be able to justify why selected research methods were chosen and state the intended outcomes of the study.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = 36 Percentage = 86.19 The target of 80% was Met
[3.2] Identify steps used in a particular study.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = 36 Percentage = 88.91 The target of 80% was Met
[3.3] Be able to outline and explain the key features of the adopted method.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = 36 Percentage = 86.19 The target of

						80% was Met
[3.4] Analyze and interpret collected data based on the adopted method and draw appropriate conclusions.	COSC 2336, CPSC 4317, COSC 4310	Rubric and Project	CPSC 4317 and COSC 4310	Spring and Fall of every year	Dr. Jiangjiang Liu and Dr. Bo Sun	Size = 36 Percentage = 88.91 The target of 80% was Met

Date: May 31, 2019

Results: This year all direct measure targets were met as compared to last year in which the targets for 2 criteria were not met. This year 2 targets for indirect measure in course evaluations were not met which is the same as last year when 2 were also not met although the 2 questions not meeting targets were different from last year. Question 38 in COSC 2336 (3.39) and question 38 in CPSC 4317 (3.60) did not meet the target of 3.75. The targets for question 38 were met in other courses so we will not make any changes for now.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 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.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[4.1] Demonstrate understanding of evolving computer technology applications.	COSC 1172, COSC 3325	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 37 Percentage = 96.64 The target of 80% was Met
[4.2] Demonstrate knowledge of positive social impacts including information globalization, E-Commerce, E-learning and new job creation.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4317	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 37 Percentage = 96 The target of 80% was Met
[4.3] Demonstrate knowledge of negative social impacts including internet pornography, privacy violation, health hazards, computer crimes and dehumanization.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4317,	Exam Questions	COSC 3325, CPSC 4317	Fall and Spring each year	Dr. Stefan Andrei, Dr. Bo Sun	Size = 53 Percentage = 87.92 The target of 80% was Met
[4.4] Demonstrate basic understanding of intellectual property protection via copyright and patent law and fair use exception for copyrighted software.	COSC 1172, COSC 3325, CPSC 4340, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 65 Percentage = 96.43 The target of 80% was Met

--	--	--	--	--	--	--

Date: May 31, 2019

Results: The results met all direct and indirect (student evaluations, exit interviews, exit surveys, alumni surveys) targets. This is the same situation as last year when all targets were also met.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 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.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[5.1] Know the differences of various philosophical views on ethics such as deontology, utilitarianism, egoism, and relativism.	COSC 3325	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 37 Percentage = 92 The target of 80% was Met
[5.2] Understand the ACM or a similar professional body's code of ethics and principles underlying those ethics.	COSC 3325, CPSC 4360	Exam Questions	CPSC 4360	Fall Spring each year	Dr. Stefan Andrei, Dr. Peggy Doerschuk	Size = 38 Percentage = 92.63 The target of 80% was Met
[5.3] Honor the property rights of others including copyrights and patents.	COSC 1172, COSC 3325, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 37 Percentage = 92 The target of 80% was Met
[5.4] Demonstrate ability for ethical decision making within the computer profession.	COSC 1172, COSC 3325, CPSC 4317, CPSC 4360	Exam Questions	COSC 3325	Spring each year	Dr. Stefan Andrei	Size = 37 Percentage = 94 The target of 80% was Met
[5.5] Demonstrate knowledge of	COSC 1172,	Exam	COSC 3325	Spring each	Dr. Stefan	Size = 37

factors affecting fair resolution of conflicts of interests.	COSC 3325, CPSC 4360	Questions		year	Andrei	Percentage = 96 The target of 80% was Met
--	----------------------	-----------	--	------	--------	--

Date: May 31, 2019

Results: The results met all direct and indirect (student evaluations, exit interviews, exit surveys, alumni surveys) targets. This is the same situation as last year when all targets were also met.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 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.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[6.1] Demonstrate the ability to work in heterogeneous environments which are diverse in gender, ethnicity, and academic accomplishment.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Dr. Kami Makki, Dr. Doerschuk	Size = 38 Percentage = 91.47 The target of 80% was Met
[6.2] Attend team meetings and contribute towards solution of technical problems during the meetings.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Dr. Kami Makki, Dr. Doerschuk	Size = 38 Percentage = 87.05 The target of 80% was Met
[6.3] Make appropriate contributions within their skill set to the completion of the project.	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Dr. Kami Makki, Dr. Doerschuk	Size = 38 Percentage 89.57 The target of 80% was Met
[6.4] Demonstrate a sense of interdependence with	CPSC 4360, CPSC 4340, COSC 4302	Rubrics	CPSC 4340, CPSC 4360	Fall and Spring Semesters	Dr. Andrei, Dr. Kami Makki, Dr. Doerschuk	Size = 38 Percentage = 88.52

other team members.							The target of 80% was Met
---------------------	--	--	--	--	--	--	---------------------------

Date: May 31, 2019

Results: The targets for the direct measures were all met which is the same as last year. For indirect measures, some targets for questions on course evaluations in COSC 4302 and CPSC 4340 were not met. We did not have course evaluation data for CPSC 4340 due to an error on the evaluations last year, so we cannot compare CPSC 4340.

Actions: We will ask the instructor in CPSC 4340 to emphasize teamwork in the course based on the targets that were not for course evaluations in CPSC 4340.

Second Cycle Results: None.

Curriculum Outcome 7 Oral Communications**

**Graduates will demonstrate their ability to verbally communicate clearly.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[7.1] Demonstrate the ability to communicate in a given situation.	COSC 3325, COSC 4272, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = 63 Percentage = 95.55 The target of 80% was Met
[7.2] Demonstrate the ability to comprehend what is said and to show an appreciation of the importance of listening.	COSC 3325, COSC 4272, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = 63 Percentage = 95.33 The target of 80% was Met
[7.3] Communicate clearly at the level of the audience the technical material intrinsic to the discipline of computer science.	COSC 3325, COSC 4272, COSC 1172	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = 63 Percentage = 96.69 The target of 80% was Met
[7.4] Demonstrate knowledge of the	COSC 3325, COSC 4272,	Rubrics	COSC 3325, COSC 4272	Fall and Spring Semesters	Dr. Stefan Andrei,	Size = 63 Percentage =

communication process.	COSC 1172		CPSC 4360			96 The target of 80% was Met
------------------------	-----------	--	-----------	--	--	---------------------------------

Date: May 31, 2019

Results: The targets for the performance criteria for direct measures were met for all which is the same as last year. Course evaluation targets were also all met this year which is the same as last year.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 8 Written Communication Skills**

**Graduates will demonstrate their ability to write effectively both technical and non-technical materials with appropriate multimedia aids.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[8.1] Provide an introduction that grabs the attention of readers.	COSC 1172, COSC 3325, COSC 4272, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = 68 Percentage = 84.57 The target of 80% was Met
[8.2] Organize documents in terms of a few main points or themes.	COSC 1172, COSC 3325, COSC 4272, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = 68 Percentage = 91.22 The target of 80% was Met
[8.3] Choose	COSC	Rubrics	CPSC 4360,	Fall and Spring	Dr. Sun, Dr.	Size = 68

appropriate illustrations, examples, or evidence to support the written documents.	1172, COSC 3325, COSC 4272, CPSC 4360, COSC 4302		COSC 4302	Semesters	Andrei, Dr. Doerschuk	Percentage = 83.45 The target of 80% was Met
[8.4] Write appropriately for specified readers in terms of technical content.	COSC 1172, COSC 3325, COSC 4272, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = 68 Percentage = 90.80 The target of 80% was Met
[8.5] Write organized, grammatically correct reports.	COSC 1172, COSC 3325, COSC 4272, CPSC 4360, COSC 4302	Rubrics	CPSC 4360, COSC 4302	Fall and Spring Semesters	Dr. Sun, Dr. Andrei, Dr. Doerschuk	Size = 68 Percentage = 90.80 The target of 80% was Met

Date: May 31, 2019

Results: The targets for the performance criteria in Outcome 8 for direct measures were all met which is the same as last year. For indirect measures the measure target for question 34 on the course evaluation in COSC 4302 was not met although it was 3.74 which is very close to 3.75. Targets for this outcome were met in Exit Interviews but not met in Exit Surveys (3.61 with a target of 3.75). The 3.61 was also very close to the target of 3.75.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 9 Continuing Education and Lifelong Learning**

**Graduates will be demonstrate that they can independently acquire new computing related skills and knowledge in order to pursue either further formal or informal learning after graduation.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Performance Criteria	Strategies	Assessment Method(s)	Context for Assessment	Time of Data Collection	Assessment Coordinator	Analysis of Direct Results
[9.1] Be able to search scholarly publications to assist in resolving problems.	COSC 3325, COSC 4272, COSC 4302, CPSC 4360	Rubrics	COSC 3325 and COSC 4272	Fall and Spring	Dr. Andrei	Size = 4 Percentage = 95.38 The target of 80% was Met
[9.2] Intend to engage in additional formal education or participate in employer-related training or research projects.	COSC 4272	Rubrics	COSC 4272	Fall and Spring	Dr. Andrei	Size = 2 Percentage = 90.84 The target of 80% was Met.
[9.3] Independent study. Participate in Honors program or in undergraduate research at Lamar. This could be done in the STAIRSTEP Program, Presentations or Posters at Professional Conferences, COOP or Internship position reports. Student could own	COSC 4272	Rubrics	COSC 4272	Fall and Spring	Dr. Andrei	Size = 2 Percentage = 88.15 The target of 80% was Met.

a software design and development company.						
--	--	--	--	--	--	--

Date: May 31, 2019

Results: The results met all direct targets similar to last year. For indirect results most targets were not met (in course evaluations, Exit Interviews and Exit Surveys). The sample size was too small to be significant. We still need to pay attention to these results but it does not appear to be an urgent problem at this point since there is an inconsistency in the results during the 2-year period of this year and last year, taken together.

Actions: Remove course evaluation questions 27 and 35 from COSC 4272 indirect measures since the instructor does not cover that material in the course.

Second Cycle Results: None.

**G.2 - Direct Measure Results Summary: Curriculum Outcomes
2018-2019**

Summary of Curriculum Outcome Results 2018-2019					
Curriculum Outcome	Performance Criterion	2018-2019			Target \geq 80% out of students pass
		Sample Size	Sample Sections	Mean Scale [0%..100%]	
Outcome 1	1	33	2	86.42%	
	2	33	2	83.39%	
	3	26	1	81.00%	
	4	78	2	91.00%	
	5	99	5	86.17%	
	6	33	2	89.81%	
	7	62	4	85.16%	
Outcome 2.1	1	36	4	96.88%	
	2	78	2	82.00%	
	3	44	1	85.00%	
Outcome 2.2	1	78	2	82.00%	
	2	78	2	82.00%	
	3	78	2	82.00%	
	4	78	2	82.00%	
Outcome 2.3	1	44	1	82.00%	
	2	44	1	85.00%	
	3	44	1	84.00%	
	4	44	1	81.00%	
	5	22	1	86.00%	
	6	22	1	84.00%	
Outcome 2.4	1	30	2	86.70%	
	2	30	2	86.70%	
	3	30	2	86.70%	
	4	30	2	82.90%	
Outcome 2.5	1	35	2	83.05%	
	2	35	2	83.05%	
	3	35	2	83.05%	
Outcome 2.6	1	16	2	87.68%	
	2	16	2	81.12%	
	3	16	2	81.12%	
Outcome 2.7	1	20	1	60.00%	Not Met
	2	20	1	70.00%	Not Met
	3	20	1	90.00%	
Outcome 3	1	36	3	86.19%	
	2	36	3	88.91%	

	3	36	3	86.19%	
	4	36	3	88.91%	
Outcome 4	1	37	2	96.64%	
	2	37	2	96.00%	
	3	53	2	87.92%	
	4	65	2	96.43%	
Outcome 5	1	37	2	92.00%	
	2	38	2	92.63%	
	3	37	2	92.00%	
	4	37	2	94.00%	
	5	37	2	96.00%	
Outcome 6	1	38	2	91.47%	
	2	38	2	87.05%	
	3	38	2	89.57%	
	4	38	2	88.52%	
Outcome 7	1	63	4	95.55%	
	2	63	4	95.33%	
	3	63	4	96.69%	
	4	63	4	96.00%	
Outcome 8	1	68	4	84.57%	
	2	68	4	91.22%	
	3	68	4	83.45%	
	4	68	4	90.80%	
	5	68	4	90.80%	
Outcome 9	1	63	4	95.38%	
	2	26	2	90.84%	
	3	26	2	88.15%	

**G.3 - Indirect Measure Results: Student Course and Instructor
Evaluation Summary 2018-2019**

Curriculum Outcome	Course	Ques. (u#)*	Semester				Total Sample Size	Avg. [1..5]	≥3.75
			Fall		Spring				
			Sample Size	Mean [1..5]	Sample Size	Mean [1..5]			
Outcome 1	COSC 1336	27	47	3.93	36	3.88	83	3.90	
		28	47	3.82	37	3.78	84	3.80	
		29	47	3.68	37	3.75	84	3.71	Not Met
		31	47	3.97	37	3.91	84	3.94	
	COSC 1337	27	31	4.03	36	4.22	67	4.13	
		28	31	3.96	36	4.05	67	4.00	
		29	31	4.00	36	4.08	67	4.04	
		30	31	3.73	36	4.05	67	3.90	
		31	31	4.19	35	4.37	66	4.28	
	COSC 2336	27	11	3.36	12	4.00	23	3.69	Not Met
		28	11	3.45	12	3.83	23	3.64	Not Met
		30	11	3.45	12	3.66	23	3.55	Not Met
		31	11	3.18	12	4.08	23	3.64	Not Met
		32	11	2.72	12	3.58	23	3.16	Not Met
		38	11	2.91	12	3.83	23	3.39	Not Met
	COSC 2372	27	20	3.85	30	3.73	50	3.77	
		28	20	3.70	30	3.50	50	3.58	Not Met
		30	20	3.65	30	3.50	50	3.56	Not Met
		31	20	3.70	30	3.60	50	3.64	Not Met
		32	20	3.10	30	3.23	50	3.17	Not Met
	COSC 3304	27			32	4.00	32	4.00	
		28			32	3.65	32	3.65	Not

									Met
		29			32	3.31	32	3.31	Not Met
		30			32	3.65	32	3.65	Not Met
		31			32	3.65	32	3.65	Not Met
		32			32	3.40	32	3.40	Not Met
	CPSC 4317	27	5	2.20	5	4.60	10	3.40	Not Met
		28	5	2.00	5	4.80	10	3.40	Not Met
		30	5	2.60	5	4.60	10	3.60	Not Met
		38	5	2.60	5	4.60	10	3.60	Not Met
	COSC 4272	27	4	3.50	9	3.56	13	3.54	Not Met
	COSC 4302	25	43	3.88			43	3.88	
		27	43	3.93			43	3.93	
		28	43	3.88			43	3.88	
		30	43	3.67			43	3.67	Not Met
		31	43	3.91			43	3.91	
	CPSC 4340	28	24	3.96			24	3.96	
		29	24	3.92			24	3.92	
		30	24	3.67			24	3.67	Not Met
		31	24	3.79			24	3.79	
	CPSC 4360	25	9	3.78	11	4.27	20	4.04	
		27	9	4.11	11	4.18	20	4.14	
		28	9	4.44	11	4.18	20	4.29	
		29	9	4.33	11	4.27	20	4.29	
		30	9	4.44	11	4.09	20	4.24	
		31	9	3.89	11	4.18	20	4.04	
		32	9	4.11	11	4.27	20	4.19	
Outcome 2.1	COSC 2336	27	11	3.36	12	4.00	23	3.69	Not Met
		28	11	3.45	12	3.83	23	3.64	Not Met
		29	11	2.99	12	3.49	23	3.25	Not

									Met
		31	11	3.18	12	4.08	23	3.64	Not Met
		32	11	2.72	12	3.58	23	3.16	Not Met
		40	11	3.54	12	4.00	23	3.78	
	COSC 3304	27			32	4.00	32	4.00	
		37			32	4.06	32	4.06	
		40			32	3.90	32	3.90	
	COSC 3302	27			14	4.07	14	4.07	
		39			14	3.57	14	3.57	Not Met
		40			14	3.79	14	3.79	
Outcome 2.2	COSC 3304	27			32	4.00	32	4.00	
		28			32	3.65	32	3.65	Not Met
		33			32	3.75	33	3.75	
		39			32	3.68	32	3.68	Not Met
		40			32	3.90	32	3.90	
Outcome 2.3	COSC 3302	39			14	3.57	14	3.57	Not Met
		40			14	3.79	14	3.79	
Outcome 2.4	COSC 4302	27	43	3.93			43	3.93	
		28	43	3.88			43	3.88	
		35	43	3.74			43	3.74	Not Met
		39	43	3.95			43	3.95	
		40	43	3.98			43	3.98	
Outcome 2.5	CPSC 4340	27	24	3.79			24	3.79	
		28	24	3.96			24	3.96	
		39	24	3.96			24	3.96	
		40	24	4.00			24	4.00	
Outcome 2.6	CPSC 4317	28	5	2.00	5	4.80	10	3.40	Not Met
		30	5	2.60	5	4.60	10	3.60	Not Met
		38	5	2.60	5	4.60	10	3.60	Not Met
		39	5	2.80	5	4.60	10	3.70	Not

									Met
		40	5	3.00	5	4.80	10	3.90	
Outcome 2.7	COSC 2372	27	20	3.85	30	3.73	50	3.77	
		31	20	3.70	30	3.60	50	3.64	Not Met
		35	20	3.50	30	3.60	50	3.56	Not Met
		40	20	3.80	28	3.86	48	3.83	
	COSC 4310	35	19	4.11	1	3.00	20	4.05	
		38	19	4.32	1	4.00	20	4.30	
		40	19	4.16	1	4.00	20	4.15	
Outcome 3	COSC 2336	37	11	3.90	12	3.91	23	3.90	
		38	11	2.91	12	3.83	23	3.39	Not Met
		40	11	3.54	12	4.00	23	3.78	
	CPSC 4317	37	5	3.00	5	4.60	10	3.80	
		38	5	2.60	5	4.60	10	3.60	Not Met
		40	5	3.00	5	4.80	10	3.90	
	COSC 4310	35	19	4.11	1	3.00	20	4.05	
		38	19	4.32	1	4.00	20	4.30	
		40	19	4.16	1	4.00	20	4.15	
Outcome 4	COSC 1172	41	38	4.05	19	3.95	57	4.01	
	CPSC 4360	41	9	3.67	11	4.09	20	3.90	
Outcome 5	COSC 3325	36	14	4.21	6	4.00	20	4.14	
Outcome 6	COSC 4302	25	43	3.88			43	3.88	
		26	43	3.84			43	3.84	
		34	43	3.58			43	3.58	Not Met
		35	43	3.74			43	3.74	Not Met
	CPSC 4340	25	24	3.58			24	3.58	Not Met
		26	24	3.50			24	3.50	Not Met
		34	24	3.71			24	3.71	Not

									Met
		35	24	3.75			24	3.75	
	CPSC 4360	25	9	3.78	11	4.27	20	4.04	
		26	9	3.89	11	4.27	20	4.09	
		34	9	4.11	11	4.38	20	4.25	
Outcome 7	CPSC 4360	25	9	3.78	11	4.27	20	4.04	
		26	9	3.89	11	4.27	20	4.09	
		34	9	4.11	11	4.38	20	4.25	
Outcome 8	COSC 4302	26	43	3.84	12	4.00	55	3.87	
		34	43	3.58	12	4.33	55	3.74	Not Met
	CPSC 4360	26	9	3.89	11	4.27	20	4.09	
		34	9	4.11	11	4.38	20	4.25	
Outcome 9	COSC 4272	27	4	3.50	9	3.56	13	3.54	Not Met
		34	4	3.50	9	4.22	13	3.99	
		35	4	3.50	9	3.56	13	3.54	Not Met
		40	4	3.50	9	3.78	13	3.69	Not Met
		42	4	4.25	9	4.33	13	4.30	

G.4 - Indirect Measure Results: Exit Interview Summary 2018-2019

A. Program Quality. Each item is measured on a 10-point scale with a goal of a mean score of at least 7.5.

Question	Semester				Total Sample Size	Average	≥7.5
	Fall		Spring				
	Sample Size	Mean	Sample Size	Mean			
1	8	6.87	14	7.58	22	7.32	Not Met
2	8	7.00	14	7.02	22	7.01	Not Met
3	8	7.00	14	7.07	22	7.04	Not Met
4	8	7.12	14	7.82	22	7.56	

B. Department Curriculum Outcomes. Each item is measured on a 5-point scale with a goal of a mean score of 3.75.

Curriculum Outcome	Question	Semester				Total Sample Size	Average [1..5]	≥3.75
		Fall		Spring				
		Sample Size	Mean [1..5]	Sample Size	Mean [1..5]			
Outcome 1	1	8	4.50	14	4.42	22	4.44	
	2	8	3.87	14	4.07	22	3.99	
	3	8	3.87	14	4.00	22	4.13	
	6	8	4.25	14	4.07	22	4.13	
	12	8	4.12	14	3.78	22	4.13	
Outcome 2	15	8	4.37	14	4.07	22	4.17	
Outcome 3	3	8	3.87	14	4.00	22	4.13	
	4	8	4.25	14	4.42	22	4.35	
	6	8	4.25	14	4.07	22	4.13	
	7	8	3.87	14	4.00	22	3.95	
Outcome 4	5	8	3.75	14	4.00	22	3.90	
	9	7	3.85	14	4.07	21	3.99	
Outcome 5	9	7	3.85	14	4.07	21	3.99	
Outcome 6	4	8	4.25	14	4.42	22	4.35	
	7	8	3.87	14	4.00	22	3.95	
	8	8	3.87	14	3.71	22	3.76	
	11	8	3.50	14	3.85	22	3.72	Not Met

	13	8	3.62	14	3.35	22	3.44	Not Met
	14	8	4.20	14	4.00	22	4.70	
Outcome 7	8	8	5.00	14	4.11	22	3.76	
	13	8	4.20	14	3.66	22	3.44	Not Met
	14	8	4.20	14	4.00	22	4.07	
Outcome 8	8	8	5.00	14	4.11	22	3.76	
	13	8	4.20	14	3.66	22	3.85	
	14	8	4.20	14	4.00	22	4.07	
Outcome 9	1	8	5.00	14	4.22	22	4.42	
	10	8	4.60	14	4.44	22	4.49	
	11	8	4.20	14	3.88	22	3.72	Not Met

G.5 - Indirect Measure Results: Exit Survey Summary 2018-2019

A. Program Quality. Each item is measured on a 5-point scale with a goal of a mean score of at least 3.75 except question 3 where the goal is between 2.25 and 4.00/year.

Question	Sample Size	Mean [1..5]	≥ 3.75
1	23	4.43	
2	23	3.70	Not Met
3	23	2.57	
4	23	4.13	
5	23	3.65	Not Met
6	23	3.96	
7	23	4.04	
8	23	3.61	Not Met
9	23	3.61	Not Met
10	23	3.74	Not Met
11	23	4.04	
12	23	3.70	Not Met
13	23	4.13	
14	23	2.57	Not Met
15	23	3.83	
16	23	4.30	
17	23	4.00	
18	23	3.87	
19	23	3.83	
20	23	3.48	Not Met

Department Student Outcomes. Each item is measured on a 5-point scale with a goal of a mean score of 3.75 except question 3 where the goal is between 2.25 and 4.00/year.

Curriculum Outcome	Question	Average [1..5]	≥ 3.75
Outcome 5	16	4.30	
Outcome 7	13	4.13	
Outcome 8	12	3.70	Not Met
Outcome 9	9	3.61	Not Met
	11	4.04	

G.6 - Indirect Measure Results: Alumni Survey Summary 2018-2019

Question	Sample Size	Mean	Target
A. Program Quality. Each item is measured on a 10 point scale with a goal of a mean score of at least 8.0.		Scale [0..10]	>=8.0
1	1	7.0	
2	1	7.0	
3	1	6.0	
4	1	8.0	
B. Department Student Outcomes. Each item is measured on a 5 point scale with a goal of a mean score of 4.0.		Scale [1..5]	>=4.0
1	1	4.0	
2	1	4.0	
3	1	4.0	
4	1	3.0	
5	1	3.0	
6	1	4.0	
7	1	3.0	
8	1	3.0	
9	1	5.0	
10	1	4.0	
11	1	4.0	
12	1	3.0	
13	1	3.0	
14	1	4.0	
15	1	4.0	
16	1	4.0	
17	1	4.0	

G.7 - Indirect Measure Results: Advisory Board Feedback 2018-2019

The Lamar Department of Computer Science Advisory Board met on March 1, 2019 in the Lamar Library.

Written Survey

The current Program Educational Objectives (PEO) were discussed with members. After discussion no changes were offered by the Board.

A survey consisting of 6 questions was provided to members. Three surveys were returned. Answers to the survey questions are summarized below:

1. Where do you see the biggest growth in technology jobs, requiring a Computer Science degree, within the next five years?

Answers: Cloud computing and related services, machine learning, AI, robotics, web designer/web developer for web applications & SaaS products, IT services in the petrochemical industry, cybersecurity, analytics, bioinformatics, additive manufacturing, entrepreneurship

2. What are the top 5 skills you think Computer Science graduates should have today?

Answers: Business formations/startup, ability to join a team startup, interpersonal, analytical, cybersecurity, web development, design, WebUI-user interface, WebUx-user experience, Devops-infrastructure, soft skills, net framework, other IDE's, databse design, code, communication skills, business understanding

3. What other knowledge and/or skills from other disciplines, besides Computer Science, do you feel are very important for computing-related jobs?

Answers: Grant application writing, industrial safety, basics of automation & process control, interpersonal skills, time management, public speaking, team collaboration, interviewing basics, math, business courses, written communication skills

4. Do you think Lamar University should add any new courses, concentrations or degrees that would better prepare students for jobs in computing?

Answers: Concentration in web application development, cybersecurity strategy course

5. What programming languages do programmers use at your organization?

Answers: JavaScript, CSS, HTML5, SQL, serverless functions, Python, C++, Java, C#, C, objective C, PHP, Lua

6. What would you like to hear about in future Advisory Board meetings?

Answers: Innovation, business opportunities, cybersecurity development, drone usage, future development of High-Performance Cluster at Lamar

G.8 - Indirect Measure Results: ETS Exams 2018-2019

SEMESTER	SAMPLE SIZE	MEAN SCORE	PROG. FUND.	SYSTEMS	ALGOR.	LOW SCORE	HIGH SCORE
Fall 2002	4	135.5	sample	size too	small	124	143
Spring 2003	9	144.2	41.8	33.2	41.3	131	173
Fall 2003	6	151.0	48.8	36	44.8	131	169
Spring 2004	5	162.2	sample	size too	small	139	178
FALL 2004	8	153.8	56.4	36.6	44.9	125	180
Spring 2005	7	172.7	78.7	55.3	66.3	159	194
Fall 2005	1	175	sample	size too	small	175	175
Spring 2006	5	158.2	sample	size too	small	154	171
Fall 2006	6	142.5	56	31	31	130	156
Spring 2007	4	156.5	67	52	40	148	167
Fall 2007	2	161	66	53	46	154	168
Spring 2008	6	149	67	36	31	130	154
Fall 2008	2	149.2	66	60	44	145	175
Spring 2009	7	150	60	46	33	130	164
Fall 2009	5	148	59	50	29	133	159
Spring 2010	3	155.3	65	44	44	140	164
Fall 2010	3	158.3	71	36	54	148	173
Spring 2011	2	142.5	50	26	38	137	148
Fall 2011	4	144.8	53	35	33	127	170
Spring 2012	4	151.1				141	165
Fall 2012	5	145.4				134	158
Spring 2013	5						

Fall 2013	8	161	55	62	48	138	181
Spring 2014	8	143	38	31	41	123	163
Fall 2014	9	146	51	36	34	131	173
Spring 2015	11	134	32	22	30	120	150
Fall 2015	3	155				142	179
Spring 2016	13	149	42	39	45	130	174
Fall 2016	5	141	32	34	38	125	157
Spring 2017	12	148				122	165
Fall 2017	6	155.3	63	52	47	140	170
Spring 2018	7	163.8	65	55	69	120	179
Fall 2018	14	154	55	49	50	136	176
Spring 2019	18	147.1				122	178

Appendix H – Curriculum Map (2019-2020)

Revised 24 June 2019. Same as 2018-2019 with the following exceptions:

- 1) COSC 4333 added
- 2) CPSC 4361/4363 added

I: Introductory course

R: Reinforce course

S: Summative course

*: Indicates those courses may contain the content related to the performance criteria, but do not affect the assessment strategies.

Curriculum Outcome 1	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	
	Apply UML interaction diagrams and class diagrams to illustrate object models		I	R	R															S	
	Apply important design patterns to OOD									R										S	
	Create useful software architecture documentation				I				R				R		R		R	S	R		

	Develop correct and efficient programs		I	R	R				S						R		R			S
	Debug implemented software in a proficient manner		I	R	S	S														S
	Design user interfaces appropriate to a large software system		I	R											R		R			S
	Develop user-level documentation for software		I	I	S	R		R	R	R	R	R	R	R	R	R	R	R	R	S
Curriculum Outcome 2.1	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Be able to develop software to support specific operations on frequently used discrete				S								*				*			

structures such as lists, trees, and graphs.																			
Be able to use elementary concepts of combinatorics, probability, and statistics to analyze and evaluate the efficiency of algorithms.						I		S											
Be able to use concepts of discrete mathematics, automata, and finite state machines to explain the design of computer hardware				I	R	I	S												

Curriculum Outcome 2.2	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	
	Demonstrate basic understanding of asymptotic notations and time complexity				I		I		S												
	Design efficient algorithms and compare competing designs				I				S											*	
	Demonstrate basic understanding of some design approaches such as greedy algorithms, dynamic programming and divide-and-conquer				I				S												

	Demonstrate familiarity with standard searching and sorting algorithms and linear and non-linear structures				I		I		S											
Curriculum Outcome 2.3	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Demonstrate basic knowledge of equivalences between various types of languages and corresponding accepting devices including Turing Machines.							S												

Demonstrate basic knowledge of practical applicability of various types of grammar and of some standard representation forms							S											
Demonstrate knowledge of limitations of computational capability of computer grammars						S		R										
Demonstrate basic knowledge of equivalences and normal forms of logical formulas in propositional logic					I	S		R										

	Demonstrate basic understanding and appreciation of the various essential programming languages constructs, paradigms, evaluation criteria, and language implementation issues									S											
	Demonstrate basic knowledge and skills in programming techniques with the focus on concepts and not on a particular language									S											
Curriculum Outcome 2.4	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361	CPSC 4363

Knows the main components of an operating system and their purposes and modes of interaction												S						
Knows the structure of device drivers and the interaction between device drivers and operating systems.												S						
Outlines the basic issues in memory management design and virtual memory												S						
Can develop basic system applications based on operating system APIs												S		R		R		

Curriculum Outcome 2.5	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Demonstrate the application of Entity-Relational diagrams to model real world problems.																	S		
	Design relations for real world problems including implementation of normal forms, keys, and semantics constraints for each relation.																	S	R	
	Demonstrate competence in implementations of database applications																	S		

Curriculum Outcome 2.6	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	
	Employ the socket API to program applications among independent hosts.														S		S				
	Explain common network architectures, the services provided by each layer, and the protocols required for connecting peer layers.														S		S				
	Evaluate network models through simulation and the use of common performance metrics for networks.														S		S				

Curriculum Outcome 2.7	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	
	Understands modern ISA design principles and employs them to evaluate systems					I								S							
	Know how to measure performance for different computer architectures													S							
	Demonstrate knowledge of hardware implementation of numbers and arithmetic operations					I								S							
Curriculum Outcome 3	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	

Be able to justify why selected research methods were chosen and state the intended outcomes of the study				I									S	S		S			
Identify steps used in a particular study				I									S	S		S			
Be able to outline and explain the key features of the adopted method				I									S	S		S			
Analyze and interpret collected data based on the adopted method method and draw appropriate conclusions				I									S	S		S			

Curriculum Outcome 4	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363	
	Demonstrate understanding of evolving computer technology applications	I									S										
	Demonstrate knowledge of positive social impacts including information globalization, E-Commerce, E-learning and new job creation.	I									S				R		R	*			
	Demonstrate knowledge of negative social impacts including internet pornography, privacy violation,	I									S				R		S	*			

	health hazards, computer crimes and dehumanization.																				
	Demonstrate basic understanding of intellectual property protection via copyright and patent law and fair use exception for copyrighted software	I									S								*		S
Curriculum Outcome 5	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361	CPSC 4363
	Know the differences of various philosophical views on ethics such										S										

as deontology, utilitarianism, egoism, and relativism.																				
Understand the ACM code of ethics or a similar professional body's code of ethics and principles underlying those ethics.										R									S	
Honor the property rights of others including copyrights and patents	I									S				R					*	
Demonstrate ability for ethical decision making within the computer profession.	I									S						R			*	

	Demonstrate knowledge of factors affecting fair resolution of conflicts of interests.	I									S								*	
Curriculum Outcome 6	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Demonstrate the ability to work in heterogeneous environments which are diverse in gender, ethnicity, and academic accomplishment.	I											R					S	S	
	Attend team meetings and contribute towards solution of technical problems during the meetings	I											R					S	S	

	Make appropriate contributions within their skill set to the completion of the project.	I												R					S	S	
	Demonstrate a sense of interdependence with other team members	I												R					S	S	
Curriculum Outcome 7	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361	CPSC 4363
	Demonstrate the ability to communicate in a given situation	I									S	S									
	Demonstrate the ability to comprehend what is said and to show an appreciation of the importance	I									S	S									

	of listening																			
	Communicate clearly at the level of the audience the technical material intrinsic to the discipline of computer science.	I									S	S								
	Demonstrate knowledge of the communication process.	I									S	S								
Curriculum Outcome 8	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Provide an introduction that grabs the attention of readers.	I									R	R	S						S	

	Organize documents in terms of a few main points or themes	I									R	R	S						S	
	Choose appropriate illustrations, examples, or evidence to support the written documents	I									R	R	S						S	
	Write appropriately for specified readers in terms of technical content.	I									R	R	S						S	
	Write organized, grammatically correct reports.	I									R	R	S						S	
Curriculum Outcome 9	Performance Criteria	COSC 1172	COSC 1336	COSC 1337	COSC 2336	COSC 2372	COSC 2375	COSC 3302	COSC 3304	COSC 3308	COSC 3325	COSC 4272	COSC 4302	COSC 4310	COSC 4333	CPSC 4302	CPSC 4317	CPSC 4340	CPSC 4360	CPSC 4361 4363
	Be able to search scholarly publications										S	S	*						*	

to assist in resolving problems.																			
Intend to engage in additional formal education or participate in employer-related training or research projects										S									
Independent study. Participate in Honors program or in undergraduate research at Lamar. This could be done in the STAIRSTEP Program, Presentations or Posters at Professional Conferences, COOP or										S									

	Internship position reports.																		
--	------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix I - Department Programming Documentation Standard

Programming Documentation Requirements

- I. **“External” Documentation (or Program Information):** In programming courses, the comprehensive set of documents that detail the design, development, and structure of a program are usually condensed into a comparatively brief ‘block comment’ at the top of the source code. This “external” documentation will minimally include:
 - a. Author(s) name, the course name/number, assignment name/number, instructor’s name, and due date.
 - b. Detailed description of the problem the program was written to solve, including the algorithm used to solve the problem.
 - c. The program’s operational requirements, such as the programming language, special compilation information, and the input information.
 - d. Required features of the assignment that author(s) were not able to complete, and/or information about the existing bugs.

- II. **Documentation about the “Classes”:** When writing the code for a class in an object-oriented programming language, it should be preceded by a block comment minimally containing the following:
 - a. The class name, (author(s) name in team projects,) the names of any external packages upon which the class depends, the name of the package for the classes containing this class (if any), and the inheritance information.
 - b. An explanation of the purpose of the class.
 - c. Brief descriptions of the class and instance constants and variables.
 - d. Brief descriptions of constructors as well as the implemented class and instance methods.

- III. **“Internal” Documentation (or in-program documentation):** The details of the program are explained by comments and placed within the code. The internal documentation should minimally include the following:
 - a. A ‘block comment’ which should be placed at the head of every method (also known as the function or subprogram). This will include the method name; the purpose of the method; the method’s pre- and post-conditions; the method’s return value (if any); and a list of all parameters, including direction of information transfer (into this method, out from the method back to the calling method, or both), and their purposes.
 - b. Meaningful identifier names. Traditionally, simple loop variables may have single letter variable names, but all others should be meaningful. Never use nonstandard abbreviations. If the programming language has a naming convention for variables, methods, classes, etc., then those conventions should be used.

- c. Each variable and constant must have a brief comment immediately after its declaration that explains its purpose. This applies to all variables, as well as to fields of structure declarations.
- d. Complex sections of the program that need some more explanations should have comments just before or embedded in those program sections.

IV. **Miscellaneous / Optional Requirements:**

- a. Write programs with appropriate modularity; that is, create classes when appropriate, write methods that accomplish limited, well-defined tasks, etc.
- b. Global/public variables should be avoided in programs, unless it is required.
- c. Use “white spaces” (blank lines) to set apart logically related sections of code.
- d. Indent bodies of methods, loops, and “if” statements, and do so with a single, consistent style.
- e. Unconditional branching (such as the “goto“ statement) should be avoided in programs unless it is required for that specific language (such as the assembly language).

Notes. There is a number of standards and tools for program documentation, such as IEEE 1063-2001 “Standard for Software User Documentation” written by IEEE, ISO/IEC 18019-2004 and ISO/IEC TR 9294 written by the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC).

Tools such as Doxygen, javadoc, ROBODoc, and TwinText can be used to auto-generate the code documents. Hence, these tools add more capabilities for document preparation. For example, they are able to extract the comments from the source code and create reference manuals in such forms as text or HTML files.

References

1. O. McCann. “Toward Developing Good Programming Style”. <http://www.cs.arizona.edu/people/mccann/style.html>, [accessed Jan 17, 2012]
2. P. DePasquale. <http://www.comtor.org/> [accessed Jan 17, 2011]
3. O. Paull, “The Importance of Software Documentation”, [accessed Jan 17, 2012]
4. Dimitri van Heesch: “Doxygen Documentation. Generate documentation from source code”, 2012, <http://www.stack.nl/~dimitri/doxygen/> [accessed Jan 17, 2012]

Appendix J – Meeting Minutes 2018-2019

This appendix includes minutes from meetings during the 2018-2019 year that were relevant to assessment. The following minutes are included:

Assessment Committee Meetings 2018-2019 Academic Year

1. Assessment Committee, May 31, 2019

**Department of Computer Science
Assessment Committee Meeting
May 31, 2019
Maes Building, Room 59A**

**Lamar University ABET Assessment Report 2018-2019
Direct and Indirect Measure Comparison 2018-2019**

Committee Members:

Dr. Roden, Committee Chair Dr. Andrei Dr. Liu Dr. Zhang Dr. Osborne

Committee Members In Attendance:

Dr. Roden, Committee Chair Dr. Andrei Dr. Liu Dr. Zhang Dr. Osborne

Minutes Taken By: Paula Gregory and Dr. Roden

Dr. Roden called the meeting to order at 1:30 pm.

G.1 – Direct Measure Results and Assessment Analysis 2018-2019

Using the feedback from the indirect measures specified in Appendices E.1 and the results from our direct measures, the analysis of our assessment findings, actions taken, and recommendations for improvement are presented in this document. Note that the selected questions used on final examinations for each performance criterion are submitted by the faculty and approved by the departmental Assessment Committee to ensure adequate appropriate depth and consistency of content across time.

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

On the G.3 – Indirect Measure Results Handout, Dr. Osborne asked Dr. Roden to change two values in the table that were incorrectly listed one of which was a notation that 4.0 was the target and should have been listed as 3.75 instead. Dr. Roden informed Dr. Osborne that the changes would be made to the report.

Dr. Roden began the meeting with reviewing his reports on the Curriculum Outcomes 1, 2.1, and 2.2.

Curriculum Outcome 1 Software Fundamentals

Indirect Assessment Methods:

Student Evaluation, Exit Interview, Alumni Survey, ETS Scores

Results: All direct measure targets were met. This was similar to last year when all targets were met. Indirect measure targets were similar to last year with the exception that in course evaluations all indirect measure targets for COSC 2336 were not met as compared to

last year when all were met in COSC 2336. However, all of those scores were greater than 3.0 out of 5.0. We will bring this to the attention of the instructors who teach COSC 2336. also showed an improvement this year as compared to last year. Last year 37 of 47 targets were met for course evaluation questions. This year 24 of 47 were met – a decrease of 13. Also, all targets were met for this outcome in exit interviews.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 2.1 Computer Science Technology

Results: All direct measure targets were met this year as compared to last year when we did not meet criteria 2.1.2. For indirect measures, last year we met all targets but this year we did not meet the targets for course evaluation questions in COSC 2336 and COSC 3304. However, the scores were very close to the targets of 3.75 out of 5.0 except questions 29 and 32. Those two questions are related to knowledge we expect students to learn later in the program so this was not a big concern at this point in the sophomore (COSC 2336) and junior (COSC 3304) courses.

Actions: None.

Second Cycle Results: Last year we discussed with the instructor of COSC 3304 the fact we did not meet the direct measure target for criteria 2.1.2. It appears that discussion was productive

Curriculum Outcome 2.2 Computer Science Technology Skills

Results: This year we met all 4 targets for direct measures criteria compared to last year when we did not any of the 4. In indirect measures, this year only 2 targets for course evaluations were not met by small margin: 3.65 and 3.68 (the targets were 3.75). Last year we met the targets for all course evaluations at 3.9 each for all 4 questions related to this outcome on the course evaluations. Overall, this was a big improvement from last year. We also note there was a much larger sample size this year (78 students compared to 14 for direct measures).

Actions: None.

Second Cycle Results: Last year we asked the instructor in COSC 3304 to review and adjust the final exam as needed, based on the most recent textbook and lecture materials. We also asked the instructor to add additional coursework to the course. It appears these adjustments produced the desired result since we see and improvement.

Dr. Zhang presented his reports on the Curriculum Outcomes 2.3, 2.4, and 2.5 Student Outcome 2.3 Formal Languages and Computability Theory

Results: This year all direct measure targets were met which is the same as last year when all were met. Including the criteria 2.3.4 which was not met with a sample size of 7 last year.

This was an improvement from last year. Indirect measure targets also showed an improvement this year as compared to last year. Last year targets for both of the two questions on student evaluation surveys were met. This year one was not met – question 39 in COSC 3302.

Actions: We will ask the person responsible for administering course evaluations to revise question 39 since it was incorrectly worded on the course evaluations this year. The new wording will be “The knowledge of a firm theoretical...”. What was missing from the question was “The knowledge of a” and so the question appeared unclear.

Second Cycle Results: None

Curriculum Outcome 2.4 Operating Systems

Results: All the direct measure targets were met for this outcome with a sample size of 13. All performance targets were met for indirect results this year except question 35 on the course evaluation for COSC 4302 although the score for that question was very close to the target of 3.75 at 3.74. Targets for exit interviews and exit surveys were all met.

Actions: None.

Second Cycle Results: None

Curriculum Outcome 2.5 Database Design

Results: All the direct measure targets were met for this outcome with a sample size of 35. All data for the indirect measure targets were also met.

Actions: None.

Second Cycle Results: This year we collected data for indirect measure targets unlike last year in which we did not due to the hurricane.

Dr. Liu presented her reports on the Curriculum Outcomes 2.6, 2.7, and 3

Curriculum Outcome 2.6 Computer Networks

Results: This year all direct measure targets were met unlike last year when criteria 2.6.2 and 2.6.3 were not met. The sample size this year was slightly larger at 16 compared to 14 last year. All indirect measure results from CPSC 4317 Student Course Evaluation were not met except for question 40, slightly worse than last year, although the scores were very close to the targets of 3.75 (3.4, 3.6, 3.7 and 3.7). We did not have indirect data last year for this outcome due to a problem with questions not appearing on the student evaluations – a problem we corrected this year.

Actions: We will remove question 30 from the course evaluation of CPSC 4317 because the concept asked about in the question is not taught in that course (software testing procedures).

Second Cycle Results: Last year we decided to make COSC 4302 Operating Systems a co/pre-requisite for CPSC 4317 Networking and we expected to see improvement in direct measures. Apparently, this was effective since there was an improvement in direct measures.

Curriculum Outcome 2.7 Computer Organization and Architecture

Results: This year we did not meet the targets for direct measures criteria 2.7.2 (60/100%) and 2.7.2 (70/100%). Last year we met all these direct measure targets at 100% for all 3 criteria. Indirect measures improved this year as compared to last year although targets for course evaluations in COSC 2372 were low and did not meet targets.

For Outcome 2.7 Performance Criteria 2.7.1 60% (<80%) in 2018-2019 and 100% (>80%) in 2017-2018. The performance criteria 2.7.1 is "Understand modern ISA design principles and employs them to evaluate systems." The assessment results are based on three questions on the final exam where the students were asked to explain instruction implementation and execution.

For Outcome 2.7 Performance Criteria 2.7.2 70% (<80%) in 2018-2019 and 100% (>80%) in 2017-2018. The performance criteria 2.7.2 is "Know how to measure performance for different computer architectures." The assessment results are based on two questions on the final exam where the students were asked to measure performance for different computer architectures.

Actions: The instructor will adjust some questions on the final exam in COSC 4310. We will inform the instructor of COSC 2372 that indirect measure targets were not met in course evaluations for COSC 2372.

Second Cycle Results: None.

Curriculum Outcome 3 Scientific Method

Results: This year all direct measure targets were met as compared to last year in which the targets for 2 criteria were not met. This year 2 targets for indirect measure in course evaluations were not met which is the same as last year when 2 were also not met although the 2 questions not meeting targets were different from last year. Question 38 in COSC 2336 (3.39) and question 38 in CPSC 4317 (3.60) did not meet the target of 3.75. The targets for question 38 were met in other courses so we will not make any changes for now.

Actions: None.

Second Cycle Results: None.

Dr. Andrei presented his reports on the Curriculum Outcomes 4, 5, and 9

Curriculum Outcome 4 Societal Measures

Results: The results met all direct and indirect (student evaluations, exit interviews, exit surveys, alumni surveys) targets. This is the same situation as last year when all targets were also met.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 5 Ethical Standards

Results: The results met all direct and indirect (student evaluations, exit interviews, exit surveys, alumni surveys) targets. This is the same situation as last year when all targets were also met.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 9 Continuing Education and Lifelong Learning

Results: The results met all direct targets similar to last year. For indirect results most targets were not met (in course evaluations, Exit Interviews and Exit Surveys). The sample size was too small to be significant. We still need to pay attention to these results but it does not appear to be an urgent problem at this point since there is an inconsistency in the results during the 2-year period of this year and last year, taken together.

Actions: Remove course evaluation questions 27 and 35 from COSC 4272 indirect measures since the instructor does not cover that material in the course.

Second Cycle Results: None.

Dr. Osborne presented his reports on Curriculum Outcomes 6, 7, and 8

Curriculum Outcome 6 Collaborative Work Skills

Results: The targets for the direct measures were all met which is the same as last year. For indirect measures, some targets for questions on course evaluations in COSC 4302 and CPSC 4340 were not met. We did not have course evaluation data for CPSC 4340 due to an error on the evaluations last year, so we cannot compare CPSC 4340.

Actions: We will ask the instructor in CPSC 4340 to emphasize teamwork in the course based on the targets that were not for course evaluations in CPSC 4340.

Second Cycle Results: None.

Curriculum Outcome 7 Oral Communications

Results: The targets for the performance criteria for direct measures were met for all which is the same as last year. Course evaluation targets were also all met this year which is the same as last year.

Actions: None.

Second Cycle Results: None.

Curriculum Outcome 8 Written Communication Skills

Results: The targets for the performance criteria in Curriculum Outcome 8 for direct measures were all met which is the same as last year. For indirect measures the measure

target for question 34 on the course evaluation in COSC 4302 was not met although it was 3.74 which is very close to 3.75. Targets for this outcome were met in Exit Interviews but not met in Exit Surveys (3.61 with a target of 3.75). The 3.61 was also very close to the target of 3.75.

Actions: None.

Second Cycle Results: None.

Dr. Roden asked members if there was any other business that needed to be taken care of and the committee replied no, it was unanimous.

Adjournment of Meeting

Dr. Liu made a motion to adjourn the meeting, it was seconded by Dr. Zhang and all were in favor.

Adjournment was at 3:41 pm.

Appendix K – Course Schedules 2018-2019

Computer Science Schedule Fall 2018

Faculty	Subject	Course	Section	Course Title	Begin Time	End Time	Day	Room
Andrei	COSC	2336	1	Programming Fundamentals III	2:20 PM	3:40 PM	R	107
	COSC	2375	1	Discrete Structures	10:20 AM	11:15 AM	MW	109
	COSC	3308	1	Design Programming Languages	9:35 AM	10:55 AM	TR	111
	COSC	3325	48F	Computer Law/Ethics				
	COSC	4272	48F	Senior Seminar				
	COSC	5360	1	Intern-Grad Students	8:00 AM	8:55 AM	M	00059A
	COSC	5361	1	Internship-2	9:10 AM	10:05 AM	M	00059A
	COSC	5390	2	Thesis I	8:00 AM	8:55 AM	T	00059A
Beard	COSC	1371	1	Microcomputers	5:30 PM	6:50 PM	TR	0212B
	COSC	1371	2	Microcomputers	9:10 AM	10:05 AM	MWF	0212B
	COSC	1371	3	Microcomputers	10:20 AM	11:15 AM	MWF	0212B
	COSC	2330	49F	Web 2.0				
Chiou	COSC	1371	49F	Microcomputers				
	COSC	3320	10B	Web Design/XHTML				
	COSC	3320	48F	Web Design/XHTML				
Doerschuk	COSC	5390	3	Thesis	9:10 AM	10:05 AM	W	00059A
	COSC	5391	3	Thesis II	9:10 AM	10:05 AM	W	71
	CPSC	4360	1	Software Engineering	2:20 PM	3:40 PM	R	108
	CPSC	4370	1	Artificial Intelligence	3:50 PM	5:10 PM	TR	111
	CPSC	5360	1	Software Engineering	2:20 PM	3:40 PM	R	108
	CPSC	5370	1	Artificial Intelligence	3:50 PM	5:10 PM	TR	111
	COSC	2336	48F	Programming Fundamentals III				
F Sun	COSC	1371	1	Microcomputers	9:35 AM	10:55 AM	TR	0212B
	COSC	1371	48F	Microcomputers				
	COSC	1371	8B	Microcomputers				
	COSC	4301	10B	Spec Topic: Computer Forensics				
Jarrell	COSC	1381	8B	Intro to Game Programming				

	COSC	1381	48F	Intro to Game Programming				
Koh	COSC	4304	1	Foundations of Programming	8:00 AM	8:55 AM	W	108
	COSC	5315	1	Foundations Comp Sci	9:10 AM	10:05 AM	W	111
	COSC	5390	12	Thesis	10:20 AM	11:15 AM	W	00059A
	COSC	5391	12	Thesis II	11:30 AM	12:25 PM	W	00059A
	COSC	2375	49F	Discrete Structures				
Liu	COSC	4310	48F	Computer Architecture				
	COSC	5390	4	Thesis	9:10 AM	10:05 AM	R	00059A
	COSC	5391	4	Thesis II	11:10 AM	12:30 PM	R	00059A
	CPSC	4330	1	Multimedia Processing	10:20 AM	11:15 AM	M	108
	CPSC	5330	1	Adv Multimedia Processing	10:20 AM	11:15 AM	M	108
Makki	COSC	1174	1	Fund of Computing II Lab	2:20 PM	3:40 PM	R	213
	COSC	1174	48L	Fund of Computing II Lab	12:00 AM	12:01 AM	TBA	TBA
	COSC	1337	1	Fundamentals II	12:45 PM	2:05 PM	TR	109
	COSC	1337	48F	Programming Fund II	12:00 AM	12:01 AM	TBA	TBA
	COSC	5100	2	Graduate Seminar	12:00 AM	12:01 AM	TBA	TBA
	COSC	5390	5	Thesis	9:10 AM	10:05 AM	F	00059A
	COSC	5391	5	Thesis II	10:20 AM	11:15 AM	F	00059A
	CPSC	4340	48F	Database Design	12:00 AM	12:01 AM	TBA	TBA
	CPSC	5340	48F	Database Design	12:00 AM	12:01 AM	TBA	TBA
Mott	COSC	1172	48F	Think, Speak, Write	12:00 AM	12:01 AM	TBA	TBA
	COSC	1172	49F	Think, Speak, Write	12:00 AM	12:01 AM	TBA	TBA
	COSC	1173	49L	Programming Lab	12:00 AM	12:01 AM	TBA	TBA
	COSC	1174	49L	Fund of Computing II Lab	12:00 AM	12:01 AM	TBA	TBA
	COSC	1336	48F	Programming Fund I	12:00 AM	12:01 AM	TBA	TBA
Osborne	COSC	5302	2	Adv Operating Systems	9:35 AM	10:55 AM	TR	108
	COSC	5369	1	Graduate Project	8:00 AM	9:20 AM	TR	109
	COSC	5390	6	Thesis	9:10 AM	10:05 AM	M	00059A
	COSC	5391	6	Thesis II	10:20 AM	11:15 AM	M	98
	CPSC	4317	1	Computer Networks	12:45 PM	2:05 PM	TR	111
Roden	COSC	1324	48F	Intro to Computer Game				

				Develop				
	COSC	1336	1	Programming Fund I	10:20 AM	11:15 AM	MWF	215
	COSC	1336	3	Fundamentals I	9:10 AM	10:05 AM	MWF	109
	COSC	2324	48F	Mobile Computer Game Develop				
	COSC	4324	49F	Computer Game Developmen t I				
	COSC	5324	49F	Computer Game Developmen t I				
	COSC	5390	7	Thesis	9:10 AM	10:05 AM	T	00059A
	COSC	5391	7	Thesis II	11:10 AM	12:30 PM	T	00059A
Sun	COSC	4302	48F	Operating Systems				
	COSC	4345	47F	Computer Network Security				
	COSC	5328	1	Computing Networks	10:20 AM	11:15 AM	W	108
	COSC	5345	47F	Computer Network Security				
	COSC	5390	8	Thesis	8:00 AM	8:55 AM	W	00059A
	COSC	5391	8	Thesis II	11:30 AM	12:25 PM	W	70
Wang	COSC	1173	3	CS I Lab	11:30 AM	12:25 PM	M	0212B
	COSC	1173	4	CS I Lab	11:30 AM	12:25 PM	W	0212B
	COSC	1173	48L	Programming Lab				
	COSC	1336	49F	Programming Fund I				
	COSC	3306	48F	UNIX/C++				
	COSC	5390	9	Thesis	8:00 AM	9:20 AM	R	67
	COSC	5391	9	Thesis II	9:35 AM	10:55 AM	R	67
X Liu	COSC	4301	2	Special Topic: Cyber Security	12:45 PM	2:05 PM	TR	107
	COSC	5340	1	Special Topic: Cyber Security	12:45 PM	2:05 PM	TR	107
	COSC	5390	11	Thesis	8:00 AM	8:55 AM	M	00059A
	COSC	5391	11	Thesis II	9:10 AM	10:05 AM	M	87
Zhang	COSC	2372	48F	Computer Org/Assembl y Language	12:00 AM	12:01 AM	TBA	TBA
	COSC	4301	1	Special Topic: Computer Vision	11:10 AM	12:30 PM	TR	108
	COSC	5313	1	Analysis of Algorithms	9:35 AM	10:55 AM	R	215
	COSC	5340	1	Special Topic: Computer	11:10 AM	12:30 PM	TR	108

				Vision				
	COSC	5390	10	Thesis	8:00 AM	8:55 AM	F	72
	COSC	5391	10	Thesis II	9:10 AM	10:05 AM	F	72

Computer Science Schedule Spring 2019

Faculty	Subject	Course	Section	Course Title	Begin Time	End	Day	Building	Room
Andrei	COSC	3325	48F	Computer Law/Ethics	Online				
	COSC	4272	48F	Senior Assessment	Online				
	CPSC	4360	48F	Software Engineering	Online				
	COSC	4305	1	Internship-1	8:00	8:55	R	MA	57
	COSC	5360	1	Intern-Grad Students	8:00	8:55	F	MA	57
	COSC	5361	1	Internship-2	8:00	8:55	R	MA	00059A
	COSC	5391	1	Thesis	8:00	8:55	M	MA	57
	COSC	5360	2	Intern-Grad Students	9:10	10:05	F	TBA	TBA
	COSC	5390	1	Thesis	9:10	10:05	M	MA	57
	COSC	5315	1	Foundations Comp Sci	9:35	10:55	T	MA	215
	COSC	3304	1	Algorithms Design and Analysis	10:20	11:15	MWF	MA	108
	CPSC	5360	1	Software Engineering	12:45	2:05	T	MA	0212B
Beard	COSC	1371	2	Microcomputers	9:10	10:05	MWF	MA	0212B

	COSC	1371	3	Microcomputers	10:20	11:15	MWF	MA	0212B
	COSC	1371	4	Microcomputers	5:30	6:50	TR	MA	0212B
Chiou	COSC	1371	49F	Microcomputers	Online				
	COSC	3320	3B	Web Design/ XHTML	Online				
	COSC	3320	48F	Web Design/ XHTML	Online				
Doerschuk	COSC	2336	48F	Programming Fundam entals III	Online				
	COSC	2336	2	Programming Fundam entals III	2:20	3:40	TR	MA	109
	CPSC	4375	1	Machine Learnin g	3:50	5:10	R	MA	111
	CPSC	5375	1	Machine Learnin g	3:50	5:10	R	MA	111
F Sun	COSC	1371	1B	Microcomputers	Online				
	COSC	1371	48F	Microcomputers	Online				
	CPSC	4315	48F	Network System Adminis tration	Online				
Jarrell	COSC	3323	3B	Fundamentals of Digital Media	Online				
	COSC	3323	48F	Fundamentals of Digital Media	Online				
Koh	COSC	3302	48F	Intro to Comput er Theory	Online				
	COSC	3302	1	Intro to Comput er Theory	11:30	12:25	W	MA	68
	COSC	4304	1	Foundations of	12:40	1:35	W	MA	213

				Programming					
	COSC	5313	1	Analysis of Algorithms	1:50	3:10	W	MA	215
Liu	COSC	4310	48F	Computer Architecture	Online				
	COSC	5391	3	Thesis II	8:00	8:55	M	MA	87
	COSC	5390	3	Thesis	9:10	10:05	M	MA	87
	COSC	5310	2	Adv Computer Architecture	10:20	11:15	M	MA	00059A
	COSC	4301	3	ST:Big Data Computer Systems	11:30	12:25	M	MA	109
	COSC	5340	2	ST: Big Data Comp Systems	11:30	12:25	M	MA	109
Makki	COSC	1174	48L	CS II Lab	Online				
	COSC	1337	48F	Programming Fund II	Online				
	COSC	4301	48F	ST: Big Data Warehousing	Online				
	COSC	4301	49F	ST: Data Mining	Online				
	COSC	5311	48F	ST: Data Mining	Online				
	COSC	5340	48F	ST: Big Data Warehousing	Online				
	COSC	5391	5	Thesis	8:00	8:55	M	MA	74
	COSC	1337	2	Programming Fund II	9:35	10:55	TR	MA	103
	COSC	1174	1	CS II Lab	11:01	12:30	TR	MA	213
	COSC	5100	48F	Graduate Seminar	TBA	TBA	TBA	TBA	TBA
Mott	COSC	1172	48F	Think, Speak,	Online				

				and Writing					
	COSC	1173	48F	Programming Lab	Online				
	COSC	1174	49F	Fund of Computing II Lab	Online				
	COSC	1336	47F	Programming Fund I	Online				
	COSC	1337	49F	Fundamentals II	Online				
Osborne	COSC	2375	48F	Discrete Structures	Online				
	COSC	3304	48F	Algorithms Design and Analysis	Online				
	COSC	5302	48F	Adv Operating Syst	Online				
	COSC	5391	6	Thesis II	9:10	10:05	W	MA	98
Roden	COSC	1324	48F	Intro Computer Game Deve	Online				
	COSC	4325	48F	Game Development II	Online				
	CPSC	4381	49F	3D Animation for Computer Grap	Online				
	CPSC	5381	49F	3D Animation for Computer Grap	Online				
	COSC	1336	1	Fundamentals I	9:10	10:05	MWF	MA	107
	COSC	5325	1	Computer Game Development II	11:30	12:25	M	MA	218
	CPSC	5381	1	3D Animation for Computer Grap	11:30	12:50	W	MA	218
	COSC	5324	1	Computer Game	3:50	5:10	W	MA	218

				Develop ment I					
Sun	CPSC	4317	48F	Computer Networ ks	Online				
	COSC	4301	2	Computer network Security	10:20	11:15	W	MA	215
	COSC	5345	1	Computer Networ k Security	10:20	11:15	W	MA	215
	COSC	4302	2	Operating Systems	11:30	12:25	W	MA	108
Wang	COSC	1173	48L	CS I Lab	Online				
	COSC	1336	49F	Programming Fund I	Online				
	COSC	5390	9	Thesis	8:00	8:55	F	MA	67
	COSC	5391	9	Thesis II	9:10	10:05	F	MA	67
	COSC	1173	1	CS I Lab	11:30	12:25	M	MA	0212B
	COSC	1173	2	CS I Lab	11:30	12:25	W	MA	0212B
X Liu	COSC	5390	4	Thesis	8:00	8:55	M	MA	00059A
	CPSC	5363	1	Cybersecurity	11:10	12:30	T	MA	114
	COSC	5328	1	Computing Networ ks	2:20	3:40	TR	MA	115
	CPSC	4363	1	Cyber Security	11:10	12:30	T	MA	114
Zhang	COSC	2372	48F	Computer Org/Ass embly Languag e	Online				

	COSC	5391	7	Thesis	9:10	10:05	M	MA	72
	COSC	5369	1	Graduate Project	2:20	3:40	TR	MA	108
	COSC	4319	1	Computer Graphic s	3:50	5:10	M	MA	109
	COSC	5321	1	Computer Graphic s	3:50	5:10	M	MA	109

Computer Science Two-Year Class Rotation Schedule

Revised 7 June 2019

	o-Spring		o-Summer		o-Fall		e-Spring		e-Summer		e-Fall		Sections	Description	Online
	class	online	class	online	class	online	class	online	class	online	class	online			
COSC															
1172		1				1		1				1	4	every long	every long
1173	1	1	1		2	1	1	1	1		2	1	12	every	
1174	1	1	1		1	1	1	1		1	1	1			
1324		1				1		1			1	1			every long
1371	5	2	2	1	5	2	5	2	2	1	5	2	34	every	every
1381										1			1	odd summer	odd summer
1336	1	1	1		2	1	1	1	1		2	1	12	every	fall
1337	1	1			1		1	1			1		6	every long	spring
2324					1									odd fall	
2336	1					1	1				1		4	every long	odd fall
2372	1							1				1	2	spring	odd spring
2375		1			1			1			1				
3301													0		
3302	1							1					2	spring	even spring
3304	1							1					1	spring	even spring
3306						1						1	2	long	long
3308						1					1		2	fall	odd fall
3320		1				1		1				1	4	every long	every long
3321		1						1					2	spring	spring
3325		1					1						2	spring	odd spring

4172	1				1		1				1		4	every long	
4301													0		
4302	1				1		1					1	4	long	even fall
4304	1		1		1		1		1		1			every	
4307			1						1				2	summer	
4309			1										1	odd summer	
4310					1							1	1	fall	even fall
4319	1						1						2	even summer	
4322									1				1	even summer	
4324					1							1	2		
4325		1					1								
4333	1						1								
4341	1				1		1				1		4	every long	
4345	1						1						2	spring	
CPSC	class	online	class	online	class	online	class	online	class	online	class	online			
3316	1												1	odd spring	
4317					1							1	2	fall	even fall
4315	1						1						2	summer	
4326			1				1							summer	
4327			1				1							summer	
4328			1						1				2	summer	
4330					1						1		2	fall	
4340			1		1				1			1	4	fall & summer	even fall
4360		1			1				1		1		4	every spring	odd spring
4361	1								1						
4363					1						1				

4370					1							1	2	spring	odd spring
4375	1							1							machine learning
4380						1						1			fall
4381		1						1							spring
ELEN	class	online	class	online	class	online	class	online	class	online	class	online			
3431					1						1		2	fall by EE	
	24	15	12	1	26	12	22	18	9	3	22	17			
Sections	39		13		38		40		12		39		181		

Appendix L – Advisement by STARS

L.1 – Lamar Enrollment Agreement

LAMAR UNIVERSITY *Conditional Admission Requirements*

First-time applicants who do not meet unconditional admission requirements will be considered conditionally admitted and will have a variety of opportunities that are intended to enhance their success at Lamar University. Upon enrollment, conditionally admitted students will complete a commitment document that explains guidelines and terms for continued enrollment at LU.

Conditionally Admitted Student Commitment

Welcome to Lamar University! You have been admitted through Conditional Admission based upon your high school ranking and SAT/ACT scores. We want you to thrive during your transition to Lamar, so we have developed this commitment for you to fulfill as a part of your first-year educational experience. We commit to provide you with support resources to help you ensure your success.

Student Success Commitments: *Please initial, indicating that you understand each of the following statements:*

_____ Earn above a 0.0 GPA during your first term.

Students who do not meet this requirement during their first term are suspended and referred to the Lamar Link Program. To be considered for the Lamar University readmission process, they must earn 18 credit hours or more with a minimum 2.0 Overall GPA.

_____ Earn a minimum 2.0 Overall GPA by the end of your second term.

or

Meet the following criteria to qualify for a third term extension to earn an overall 2.0 GPA:

- *Avoid academic suspension based on Lamar University's suspension policy.*
- *Earn a C grade or higher in an English or Math course by the end of second term.*
- *Attempt a minimum fifteen (15) credit hours each semester to align with the Fifteen to Finish Initiative or qualify for a waiver.*

_____ Students who commit to a third term extension must achieve a minimum 2.0 Overall GPA at the end of their third term to continue enrollment at Lamar University.

Conditionally Admitted students must meet the above terms to avoid suspension from Lamar University without appeal.

By signing below, I am acknowledging that I fully understand the terms and accept enrollment under the guidelines stated in this document. If I have any questions or need further assistance, I will follow-up with my Academic Advisor and/or Student Support Specialist.

If I do not meet the terms of this document and am suspended from Lamar University, I will be referred to the Lamar Link program. To be considered for the Lamar University readmission process, I must earn 18 credit hours or more with a minimum 2.0 Overall GPA.

Student Name (print): _____

Lamar ID#: _____ Semester of Entry: _____

Student Signature: _____ Date: _____

Academic Advisor Signature: _____ Date: _____

L.2 – Advising Communication Timeline – Fall Semester

Undergraduate Advising Center Communication Timeline - Fall Semester

September	
Early	<ul style="list-style-type: none"> * Email welcome letter to students: <ul style="list-style-type: none"> a. Include list of campus resources b. Remind what good academic standing means (2.0 GPA) c. Encourage advisor contact for assistance or questions; with phone number
Mid	<ul style="list-style-type: none"> * Non-payment purge outreach efforts to reduce students dropped for non-payment * Advisors: begin contacting students and start first follow-ups with at-risk students <ul style="list-style-type: none"> - Be supportive in asking how classes are going; discuss course load/syllabi - Remind students of the 12th class day and explain what that means: <ul style="list-style-type: none"> a. Students can go to their SSB account and drop a class themselves b. This drop will NOT count toward the 6-drop rule c. This is the last day for a full refund of dropped (not withdrawn) courses
Late	*Progress Reports requested from faculty
October	
Early	<ul style="list-style-type: none"> * Progress Reports feedback from faculty obtained * Advisors: follow-up phone calls and create appointment regarding progress reports
Mid	<ul style="list-style-type: none"> * Advisors: continue calling students and meet with scheduled appointments -Inform students the class schedule will be available online end of October
Late	<ul style="list-style-type: none"> * Email Conditionally Admitted students: <ul style="list-style-type: none"> a. Encourage students to follow through with commitment requirements * Spring advisement begins <ul style="list-style-type: none"> a. Schedule a meeting with their advisor; seek academic assistance b. Indicate last drop/withdrawal date with academic penalty;
November	
Early	* Registration begins November 1 st ; conditional registration may be required


	<ul style="list-style-type: none"> * Advisors: continue spring advisement <ul style="list-style-type: none"> a. Review Progress Reports with students b. Explain conditional registration, if required c. Confirm phone/email contact information for accuracy and ask students if they have received prior emails
Mid	* Advisors: heavy advisement and registration continues
Late	<ul style="list-style-type: none"> * Advisors: heavy advisement and registration continues * Advisors: final follow-up appointments with at-risk populations and prep for finals
December	
Early	* Advisors: heavy advisement and registration continues
Mid	<ul style="list-style-type: none"> * Email: LU will be closed (list dates); advisement is mandatory prior to students being allowed to register; advisement will resume on (date) * Begin evaluating grades as they are available <ul style="list-style-type: none"> - Contact students about eligibility (i.e. Conditional Admission, pre-requisites, etc.) * Begin Recruit Back efforts to re-enroll fall students for spring

L.3 – Lamar Retention Programs

College	Program or Unit Name	Year of Inception	Description	Target Population	Funding
Arts & Sciences Dr. Lynn Maurer, Dean					
Cardinal Community Ms. Celine Hodges, Assistant Director	First-Year Experience	2017	Student participate in a 1-hour per week Informational seminar.	Freshman students	Local
Chemistry Dr. Xiangyang Lei, Department Chair	Tutoring		Tutoring for chemistry students.	We target those who are taking a chemistry course.	Local
Computer Science Dr. Stefan Andrei, Department Chair	Stairstep Tutoring		Tutoring programs for science related majors. Tutoring for computer science students.	Multi-discipline target including math, physics, earth & space sciences, chemistry and computer science Students in lower-level CS programming courses including COSC 1336, 1337 and 2336.	National Science Foundation (NSF) Local
Earth & Space Sciences Dr. Jim Jordan, Department Chair	Informal Tutoring		On a case-by-case basis try to find upper level students to tutor a student needing assistance in the specific course.	All students in an earth & space science course that requests help from the department.	None
English & Modern Languages Dr. James Sanderson, Department Chair					
History Dr. Mark Mengerink, Department Chair	Informal Tutoring		On a case-by-case basis, a graduate student will try to help out with any History course needed.	Any student in a History course.	None
Mathematics Dr. Jeremy Alm, Department Chair	Tutoring Lab	1995	The lab provides free tutorial for students who take lower level mathematics courses including math core courses – College Algebra and Elementary Statistics.	We target those who take lower level mathematics courses including math cores	Local Funding (tuition and fees)

	Mentoring Program		Individual faculty members voluntarily serve as mentors for Mathematics majors.	Mathematic majors	None
Nursing Dr. Cynthia Stinson, Department Chair	The Caring Place	2003	Graduate Assistants provide facilitated learning sessions for students who request/need additional assistance in learning concepts/information. Students sign a contract that they will come to The Caring Place prepared (having read the assignments). Our role is to facilitate and support their active learning, but we do not spoon feed information to them. Our goal is for them to become active learners who know how to learn.	Our resource is open to all nursing students who have been admitted into our undergraduate ADN and BSN programs.	Initial funding from the THECB grant and support from St. Elizabeth's Hospital. Now funding is internal through the use of Graduate Assistants.

L.4 – Tutor Request Form for 2019 (available online)

 **LAMAR UNIVERSITY.**

Student Tutoring and Retention Services

- ▶ Student Tutoring And Retention (STAR) Services
- ▶ Academic Success Conference
- ▶ Tutoring
- ▶ LU Success
- ▶ Cardinal Communities
- ▶ REDtalks
- ▶ Collaborative Learning

[Home](#)

Request a Tutor

Summer 2019 Hours

Mondays-Thursdays: 11 am - 3 pm

If you are not available for tutoring during these hours, please submit your request and we will try to work around your availability.

Please fill out the information below to assist us in scheduling your appointment. Appointments are filled on a first-come, first-served basis. We are happy to contact you via email, but to ensure confidentiality, we can only do so through your @lamar.edu email address.

L# *

Cell Phone *

In what subject do you need tutoring? *

If you need tutoring in multiple classes, please submit a separate request for each.

What course content do you want to go over with the tutor? *