

# **ABET SELF-STUDY QUESTIONNAIRE: TEMPLATE FOR A SELF-STUDY REPORT**

**2012-2013 Review Cycle**



## **COMPUTING ACCREDITATION COMMISSION**

ABET, Inc.

111 Market Place, Suite 1050

Baltimore, MD 21202-4012

Phone: 410-347-7700

Fax: 410-625-2238

Email: [cac@abet.org](mailto:cac@abet.org)

Website: <http://www.abet.org>

## **Table of Contents**

Introduction.....	3
Requirements and Preparation .....	3
Preparing a Self-Study Report for a Joint Commission Review.....	4
Supplemental Materials .....	4
Submission and Distribution of Self-Study Report .....	4
Confidentiality .....	5
Template .....	5
BACKGROUND INFORMATION .....	6
CRITERION 1. STUDENTS.....	12
CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES .....	16
CRITERION 3. STUDENT OUTCOMES .....	19
CRITERION 4. CONTINUOUS IMPROVEMENT .....	21
CRITERION 5. CURRICULUM.....	25
CRITERION 6. FACULTY .....	32
CRITERION 7. FACILITIES .....	39
CRITERION 8. INSTITUTIONAL SUPPORT .....	45
PROGRAM CRITERIA .....	49
Appendix A – Course Syllabi .....	52
Appendix B – Faculty Vitae .....	53
Appendix C – Equipment.....	54
Appendix D – Institutional Summary .....	55
Signature Attesting to Compliance .....	61

## **Introduction**

The Self-Study Report is expected to be a quantitative and qualitative assessment of the strengths and limitations of the program being submitted for review.

The Self-Study Report will provide information critical to a thorough on-site review of the program. Therefore, the Report will address the extent to which the program meets applicable ABET Criteria and policies. In so doing, it is necessary that the Report address all methods of instructional delivery used for the program, all possible paths that students may take to completion of the degree, and all remote offerings available to students in the program.

Each Commission of ABET provides a *Self-Study Questionnaire* to assist the program in completing the Self-Study Report.

## **Requirements and Preparation**

The program name used on the cover of the Self-Study Report **must** be identical to that used in the institutional publications, on the ABET Request for Evaluation (RFE), and on the transcripts of graduates. This will insure that the program is correctly identified in ABET records and that graduates can be correctly identified as graduating from an accredited program.

Normally, each program requires a Self-Study Report.

While the *Questionnaire* focuses primarily on accreditation criteria, it also includes questions related to certain sections of the *ABET Accreditation Policy and Procedure Manual (APPM)*.

While it is important that the overall structure in the *Questionnaire* be retained, it is not necessary to preserve notes or pages of instructions about preparing the Self-Study Report.

A program may use terminology different from that used in the *Questionnaire*. If different terminology is used, it is important that the Self-Study Report provide notes of explanation to clearly link the terminology in the Report to terminology used in the *Questionnaire*.

Tables in the *Questionnaire* may be modified in format to more clearly present the information for the program. When this is done, it is suggested that a brief explanatory footnote be included about why the table was modified. Rows may be added to or deleted from tables to better accommodate program information.

The **educational unit** is the administrative unit having academic responsibility for the program(s) being reviewed by a given Commission of ABET. For example, if a single program is being reviewed, the educational unit may be the department. If more than one

program is being reviewed, the educational unit is the administrative unit responsible for the collective group of programs being reviewed by that Commission.

### **Preparing a Self-Study Report for a Joint Commission Review**

A joint commission review occurs when a single program is reviewed for accreditation by more than one Commission of ABET. The program must meet all applicable Criteria and policies for every commission involved.

The following Criteria are interpreted and applied similarly by all Commissions and the Self-Study Report for a joint review of a given program does not require separate responses for each Commission.

- Criterion 1: Students
- Criterion 2: Program Educational Objectives
- Criterion 4: Continuous Improvement
- Criterion 7: Facilities
- Criterion 8: Institutional Support

The following Criteria differ for each of the four Commissions and the Self-Study Report for a joint review of a given program will require Commission-specific responses.

- Criterion 3: Student Outcomes
- Criterion 5: Curriculum
- Criterion 6: Faculty

### **Supplemental Materials**

The following materials are to be supplied in addition to the Self-Study Report:

- The general institution catalog covering course details and other institutional information applicable at the time of the review.
- Promotional brochures or literature describing program offerings of the institution.
- Official transcripts of recent graduates. The team chair will request a specific sampling of transcripts for each program and will provide a timeframe in which they should be provided to program evaluators. Each transcript is to be accompanied by the program requirements for the graduate and accompanied by worksheets that the program uses to show how the graduate has fulfilled program requirements.

### **Submission and Distribution of Self-Study Report**

- To ABET Headquarters by July 1 of the calendar year of the review:
  - Submit **one** Self-Study Report including all appendices for **each** program
  - Submit **one** set of the supplemental materials (minus the transcripts) to:

Computing Accreditation Commission  
ABET, Inc.  
111 Market Place, Suite 1050  
Baltimore, MD 21202-4012

**NOTE: The Self-Study Report and Supplemental Material should be submitted as pdf read-only files on CD, DVD, or data stick. Each Self-Study Report and Supplement Material must be self-contained in the medium submitted and must not include “hot” links. The submission cannot be a combination of hard copy and electronic file. No email submission permitted.**

- To Team Chair by July 1 of the calendar year of the review:
  - Submit **one** Self-Study Report including all appendices for **each** program and
  - Submit **one** set of the supplemental material
- To Team Chair when requested
  - A set of transcripts for each program.

**NOTE: Please confirm the submission method for the Self-Study and address preference with the team chair prior to submission.**

The team chair will provide instructions and addresses for the institution to provide the Self-Study Report and Supplemental Material **directly** to each program evaluator and approved observer.

When new or updated material becomes available between the submission of the Self-Study Report and the date of the on-site review, the program should provide it to the team members as far in advance as possible or upon the team’s arrival for the on-site review. All such materials should also be sent to ABET Headquarters.

### **Confidentiality**

All information supplied is for the confidential use of ABET and its authorized agents. It will not be disclosed without authorization of the institution concerned, except for summary data not identifiable to a specific institution or documents in the public domain.

### **Template**

The template for the Self-Study Report begins on the next page.

**Self-Study Report**  
**for (Computer Science, Sam Houston State University)**

**<Date of Report>**

This section presents a complete outline of the material to be provided in each Self-Study Report. Each report should be formatted similarly to this section, preferably with the same heading titles. DO NOT DUPLICATE THE DETAILED INSTRUCTIONS.

**BACKGROUND INFORMATION**

**A. Contact Information**

List name, mailing address, telephone number, fax number, and e-mail address for the primary pre-visit contact person for the program.

**Primary contact:** Dr. Peter A. Cooper

**Telephone number:** 936.294.1569      **FAX Number:** 936.294.4312

**Electronic mail:** [cooper@shsu.edu](mailto:cooper@shsu.edu)

**B. Program History**

Include the year implemented and the date of the last general review. Summarize major program changes with an emphasis on changes occurring since the last general review.

The Computer Science program has been accredited by ABET/CAC since October 2007. This was the date of the last general review. Since the departments' formation in 2003, the most significant changes to the curriculum prior to accreditation were:

1. The formation of three areas of concentration; Computing Science, Information Systems, and Information Assurance and Security
2. The addition of laboratory components to the CS1 and CS2 courses
3. Increasing the required hours from 39 to 44 hours, comprising 26 hours of core computer science courses and 18 concentration/elective hours
4. Increasing the required Mathematics hours to 17 (Calculus 1 and 2, Discrete Mathematics, Statistical Methods and 3 advanced hours of MTH/STA)
5. The inclusion of a mandatory Ethics course.

Since the last general review, the department has undergone one significant review of the curriculum resulting in the following changes:

1. A reorganization of the content in CS1 and CS2 to improve continuity across the courses together with the development of a standardized collection of laboratory sessions and exercises taught across all sections of each course.
2. The inclusion of COSC 3318 Database Management Systems as a required course for all computer science students. Prior to this change COSC 3318 was only required for the Information Systems concentration.

3. The reorganization of the content in COSC 2329 Computer Organization I and COSC 3327 Computer Organization II to reduce duplication and provide a coherent sequencing of material.
4. The addition of a non-advanced Special Topics course COSC 2340 (fall 2012) to allow lower division students access to innovative courses offered on an ad hoc basis covering material not normally available in the curriculum.
5. Increasing the choice in elective course through the addition of COSC 3331 Human Computer Interaction, and COSC 33xx Game Design (Scheduled for fall 2013).
6. A decrease in the total number of hours required to earn a bachelor's degree from 128 hours to 120. This is a State of Texas mandated change.

### **C. Options**

The computer science program consists of 44 hours of computer science coursework supported by 17 hours of mathematics and 16 hours of natural science. The computer science coursework is structured as 26 hours of core computer science that all majors are required to complete together with an 18-hour concentration in one of the following:

1. **Computing Science:** This is a traditional, mathematically and computationally oriented concentration that focuses on coursework in Operating Systems, Language Translators, and Computer Architecture.
2. **Information Systems:** This concentration is designed to provide professional preparation for those wanting to support business and industry functions, focusing on database administration and networking.
3. **Information Assurance and Security:** This concentration provides the background for those who want to specialize in system security including network security, disaster management and forensic examination.

Each concentration allows for six hours of elective coursework. Together with General Education requirements students have an additional 12 hours of free electives.

### **D. Organizational Structure**

Using text and/or organizational charts, describe the administrative structure of the program (from the program to the department, college, and upper administration of your institution, as appropriate).

The senior academic officer at Sam Houston State University is the Provost, Dr. Jaimie Hebert. The academic wing of the university is divided into six colleges; Sciences, Humanities and Social Sciences, Business, Criminal Justice, Education, and Arts and Mass Communication. The department of Computer Science is located within the College of Sciences under the leadership of Dean John Pascarella.

The computer science department has been under the leadership of Dr. Peter Cooper since January 2003. The computer science program is the only undergraduate program offered by the department of computer science. The department does offer three graduate programs (Computer Information Systems, Digital Forensics, Information Assurance and Security)

### **E. Program Delivery Modes**

Describe the delivery modes used by this program, e.g., days, evenings, weekends, cooperative education, traditional lecture/laboratory, off-campus, distance education, web-based, etc.

The computer science program is primarily a traditional face-to-face program with the vast majority of classes taught during the day. The classes are taught in traditional classrooms supplemented with presentation facilities, wireless network access, and online course support systems (Blackboard and eCollege). There is currently insufficient demand from students to schedule classes at weekends or in the evenings.

#### **F. Program Locations**

Include all locations where the program or a portion of the program is regularly offered (this would also include dual degrees, international partnerships, etc.)

The computer science program is taught exclusively at the main SHSU Huntsville campus

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

Summarize the Deficiencies, Weaknesses, or Concerns remaining from the most recent ABET Final Statement. Describe the actions taken to address them, including effective dates of actions, if applicable. If this is an initial accreditation, it should be so indicated.

The most recent evaluation (2007) identified the following:

##### Deficiencies

“1. Standard I-5. *The results of the program’s periodic assessments must be used to help identify opportunities for program improvement.* There is no evidence that results of the assessment of objectives have been considered relative to making program improvements.”

Since 2007 the department has conducted formal evaluations documented through the Online Assessment Tracking Database” (OATdB) operated by the university. The system allows the department to identify goals, objectives, indicators, findings, and actions required for each objective. The system also requires ‘closing the loops’ statements to summarize performance improvement feedback. Copies of the OATdB documentation are available.

“2. Standard I-6. *The results of the program’s assessment and the actions taken based on the results must be documented.* There is no evidence of the documentation of the assessment process.”

See the response to I-5.

“3. Standard IV-2. *The curriculum must contain at least 30 semester hours of study in mathematics and science as specified below under Mathematics and science.* The program currently only requires 28 credits in mathematics and science.”



Beginning fall 2007, the requirements in mathematics were increased to 17 hours with the addition of a 3 hours course in discrete mathematics and the requirement of an 8-hour calculus sequence. As a result the program requires 31 hours of mathematics and science.

“4. Standard IV-6. *The core materials must provide basic coverage of algorithms, data structures, software design, concepts of programming language, and computer organization and architecture.* The program does not clearly cover concepts of programming language or computer organization and architecture in the required courses in the curriculum.”

Beginning fall 2007, the course COSC 4318 was reclassified as a core course in the program. The courses COSC 2329 Computer Organization I and COSC 3327 Computer Organization II were reorganized with regard to content so that both courses contained computer organization and architecture components. COSC 2329 Computer Organization I is a core course in the program.

“5. Standard IV-10. *The curriculum must include 15 semester hours of mathematics.* The program requires only 12 hours of mathematics.”

See response to Standard IV-2.

“6. Standard IV-11. *Coursework in mathematics must include discrete mathematics, differential and integral calculus, and probability and statistics.* Discrete mathematics is not required.

See response to standard IV-2.

“7: Standard IV-17. *There must be sufficient coverage of social and ethical implications of computing to give students an understanding of a broad range of issues in this area.* Social and ethical implications of computing are not consistently covered in any required course.

Since fall 2007, COSC 4349 Professionalism and Ethics has been part of the core computer science requirements.

### Weaknesses

“1. Standard I-3. *Data relative to the objectives must be routinely collected and documented, and used in program assessments.* The assessment process is immature and sufficient data relative to objectives and outcomes has not been collected to demonstrate a routine assessment process.”

The assessment process is maturing. Data is collected on a semester, annual and biannual basis. Semester and annual data collection is formalized through a standard procedure within the Software Engineering course and through exit and alumni surveys.

“2. Standard I-4. *The extent to which each program objective is being met must be periodically assessed.* Assessment of program quality is done informally, and is not tied to

the extent to which each objective and outcome is being met.“

Assessment is now a formal process and the results of assessment identify the degree to which each objective is being met and the results fed back into the quality improvement process.

### Concerns

“1. Standard I-1. The objectives that are defined for the program are stated as outcomes for graduates. In addition to the program outcome, the objectives must include program educational objectives that describe the career and professional accomplishments that the program is preparing graduates to achieve.”

“2. Standard II-8. The decrease in teaching loads may not provide sufficient time for the faculty to achieve the increased expectations for scholarly productivity.

Of the 11 faculty members in the department (not including the department chair and two instructors) eight are active in scholarly production. Since 2007 those eight faculty members have published 9 book chapters, 37 journal articles, and 62 conference presentations. In addition faculty members are active as paper reviewers for both conferences and journals, sit on editorial boards for academic journals. In addition they have procured \$331,000 in external grant funding and \$28,000 in internal grant funding. It is clear that the teaching workload for faculty members is not detracting from their efforts in scholarship.

“3. Standard VI-5). The heavy teaching load for the department chair may not allow sufficient time for the heavy administrative and research load”

While this concern has not been directly addressed, the College of Science is currently reviewing department chair loads across the college.

“4. There is inconsistent evidence of coverage of theoretical foundations in the curriculum”.

In 2009 the department conducted an evaluation of the program’s coverage of theoretical foundation with the ACM’s Curricula 2008 Body of Knowledge.

In particular, the architecture and digital logic component of the required Computer Organization and Machine Language course, CS 272 (COSC 2329) course was enhanced to cover all core Architecture topics; the Programming Languages course, CS 482 (COSC 4318) was enhanced to cover basic language translation; and the coverage of Net-Centric computing was expanded to be covered by in at least one of the courses required for each track in the program: (Operating Systems for the Computer Science Track, Networks and Network Theory for the Information Systems track, and Network Security for the Information Assurance track.)

**H. Joint Accreditation**

Indicate whether the program is jointly accredited or is seeking joint accreditation by more than one commission.

The program is not seeking joint accreditation.

## GENERAL CRITERIA

### CRITERION 1. STUDENTS

For the sections below, attach any written policies that apply.

#### A. Student Admissions

Summarize the requirements and process for accepting new students into the program.

A beginning freshman student who graduated from an accredited high school must take the ACT Composite or SAT I (critical reading + math). A beginning freshman student must submit all of the following documentation:

- Completed Texas Common Application or the SHSU Undergraduate Admissions Application with nonrefundable application fee
- Official copy of ACT Composite or SAT I (critical reading + math)
- Official copy of high school transcript showing class rank (if applicable). Upon graduation from high school, applicant must provide a final official high school transcript with final class rank, date of graduation, and graduation plan.

Admission requirements include the following:

- Top 10%, no minimum score on ACT Composite or SAT I (critical reading + math).
- 11-25%, a minimum score of 17 on ACT Composite or a minimum score of 850 on SAT I (critical reading + math)
- 2nd quartile, a minimum score of 19 on ACT Composite or a minimum score of 930 on SAT I (critical reading + math).
- 3rd quartile, a minimum score of 22 on ACT Composite or 1030 on SAT I (critical reading + math).
- 4th quartile, a minimum score of 25 on ACT Composite or 1140 on SAT I (critical reading + math).
- Students from non-ranking high schools, a minimum of 21 on ACT Composite or 1010 on SAT I (critical reading + math)

#### B. Evaluating Student Performance

Summarize the process by which student performance is evaluated and student progress is monitored. Include information on how the program ensures and documents that students are meeting prerequisites and how it handles the situation when a prerequisite has not been met.

One year prior to graduation students file a 'Declaration of Major' form with the registrar's office, identifying themselves as Computer Science majors with a specific concentration. The advisement coordinator, the Computer Science Department Chair and the chair of the department offering the Minor/Second major review this form.

The declaration of major form is sent to the registrar's office resulting in a definitive degree plan identifying all general education, major, minor and degree specific requirements for that student, from which a list of remaining requirements can easily be extracted.

In consultation with the advisor, the student generates a plan to complete the remaining requirements, providing a road map to graduation.

Requests for deviations for the course requirements arise from time to time and are handled at the department chair level through the following strategies:

- Provision of an independent/directed study course supervised by an appropriate faculty member in the content area required. These are offered on a voluntary basis by faculty.
- Identification of an alternate course, perhaps at another institution, that at least meets the technical and content requirements.

In the students' final semester, the registrar's office flags all graduating seniors who do not appear to be able to meet the requirements for graduation based on their current enrollment. A telephone or face-to-face consultation with the department chair is scheduled for each student on this list resulting in a resolution of the requirements or delayed graduation until requirements are met.

### **C. Transfer Students and Transfer Courses**

Summarize the requirements and process for accepting transfer students and transfer credit.

From within the institution:

- Students complete a 'Change of Major' form and submit the form to the registrar's office.
- This form requires both an advisor and a department chair signature, providing a contact point at which advising can be applied.

From another institution:

- Transcripts from transfer students from other institutions are evaluated by the admissions office based on established articulation agreements. (see <http://www.shsu.edu/catalog/admission2.html>)
- Initial advising of transfer students allows an opportunity for that transfer process to be checked, with any modifications necessary documented through the department chair.

Include any state-mandated articulation requirements that impact the program.

### **D. Advising and Career Guidance**

Summarize the process for advising and providing career guidance to students. Include information on how often students are advised, who provides the advising (program faculty, departmental, college or university advisor).

Students are allocated an advisor with the department once they indicate their desire to declare Computer Science as their major or minor. Entering fresher or transfer students have mandatory semester advisement meetings scheduled with their advisor until they have demonstrated their capability through achieving a cumulative GPA of 2.5. Students under mandatory advisement are not able to register for courses in subsequent semester without meeting with their academic advisor.

Each member of the tenured/tenure track faculty, except for those tenure track faculty new to the department, is assigned a group of student advisees for whom they are responsible. Students are free to visit both informally and formally with their advisor for enrollment and career advice.

In addition, the department chair maintains an open door policy towards student advising providing backup when faculty members are unavailable, particularly during the summer months.

The university provides an advising and mentoring service to all students, utilizing volunteer faculty. Dr. Burris, the ranking faculty member within the department volunteers his services to provided centrally located access to advising for students.

#### **E. Work in Lieu of Courses**

Summarize the requirements and process for awarding credit for work in lieu of courses. This could include such things as life experience, Advanced Placement, dual enrollment, test out, military experience, etc.

The computer science program does not provide for work in lieu of courses for life experience or for military experience. The program does allow for advanced Placement for CS1 and CS2 as a result of superior performance in high school Advanced Placement computer science tests. A score of 4 (out five) or higher on the AP test allows placement in CS2 as the first course in the degree program. A score of 5 on the advanced placement test waives the requirement for CS 1 and CS 2.

#### **F. Graduation Requirements**

Summarize the graduation requirements for the program and the process for ensuring and documenting that each graduate completes all graduation requirements for the program. State the name of the degree awarded (Master of Science in Safety Sciences, Bachelor of Technology, Bachelor of Science in Computer Science, Bachelor of Science in Electrical Engineering, etc.).

For the Bachelor of Science in Computer Science students are required to complete 120 hours of undergraduate coursework including the following:

1. General Education requirements: 31 credit hours
2. Computer Science Core: 26 credit hours
3. Concentration: 18 credit hours
4. Mathematics support: 17 credit hours
5. Natural Science support: 16 credit hours
6. Free electives: 12 credit hours

Students must complete a minimum of 42 upper division (Junior and Senior level) hours, 21 of which must be computer science courses. Students are required to maintain a minimum 2.0 GPA overall and 2.25 within the computer science major.

**G. Transcripts of Recent Graduates**

The program will provide transcripts from some of the most recent graduates to the visiting team along with any needed explanation of how the transcripts are to be interpreted. These transcripts will be requested separately by the team chair. State how the program and any program options are designated on the transcript. (See 2011-2012 APPM, section II.G.4.a.)

## **CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES**

### **A. Mission Statement**

Provide the institutional mission statement.

Sam Houston State University is an inclusive institution whose mission is to provide high quality education, scholarship, and service to students and to regional, state, national, and international constituencies.

The goals of the University are:

- Promote students' intellectual, social, ethical, and leadership growth.
- Pursue continuous improvement.
- Recruit and retain qualified, dedicated faculty and staff.
- Recruit, motivate, and retain qualified students.
- Provide the necessary library, technology, and other facilities to support quality instruction, research, and public service.
- Promote scholarly and research activities that contribute to knowledge and understanding.
- Promote and support diversity and provide equitable opportunities for underrepresented groups.
- Offer a wide range of pre-professional, baccalaureate, master's, and doctoral programs.
- Promote cooperation with educational institutions, government and non-profit agencies, and the private sector.

### **B. Program Educational Objectives**

List the program educational objectives and state where these can be found by the general public.

PEO1: Graduates will engage in successful careers in industry and/or graduate or other professional schools.

PEO2: Graduates will demonstrate the technical skill required for the workforce including knowledge of computer science techniques and the ability to utilize this knowledge to analyze and solve problems.

PEO3: Graduates will exhibit the professional skills necessary to be effective and succeed in the modern workforce including the ability to function in teams, the ability to communicate effectively, and high standard of ethics and professionalism.

PEO4: Graduates will be active in professional development and acquiring new skills to remain relevant in the computer science field.

These program educational objectives are published on the departmental web site.



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

Describe how the program educational objectives are consistent with the mission of the institution.

The Department of Computer Science shares in SHSU's mission of providing high quality education, scholarship, and service to students and to regional, state, national, and international constituencies. In our Computer Science program, this mission manifests itself in the Program Educational Objectives, asking our students to not only achieve mastery of the fundamentals of their field, but also to obtain exposure to intellectual, social, ethical, and leadership issues, critical thinking, and life-long learning, all of which are emphasized as University goals.

**D. Program Constituencies**

List the program constituencies. Describe how the program educational objectives meet the needs of these constituencies.

The Computer Science program serves two main constituencies: students and industry.

*Students*

Our primary constituents are our programs' students, including current and prospective students. As a state-funded institution, we have a special duty to residents of Texas. It is our duty to ensure that our graduates are competitive for rewarding and productive careers in the computer science profession and are prepared to be responsible, educated citizens of society. Achievement of the Program Educational Objectives by our students gives them the necessary background in computer science to prepare them for fulfilling careers and to make them educated citizens. Current students and alumni voice their opinions related to our program via several means, including course evaluations, senior exit surveys, and alumni surveys.

*Industry*

As the primary employers of our graduates, the technical industry has a major stake in the quality and content of our program. It is our duty to serve this constituency. Our Program Educational Objectives give our students' employers the confidence that their employees have mastered the fundamentals of the field and that they possess the ability to learn new technologies and methodologies as they become available. Employers can also count on our students to work in an ethical manner, to understand societal needs and expectations, and to work well in teams and be proficient in communication. The Department's Industry Advisory Board, is the primary means for soliciting input from this constituency.

**E. Process for Revision of the Program Educational Objectives**

Describe the process that periodically reviews and revises, as necessary, the program educational objectives including how the program's various constituencies are involved in this process. Include the results of this process and provide a description of any changes that were made to the program educational objectives and the timeline associated with those changes since the last general review.

Because of the change from the previous standards-based criteria to the new CAC criteria, the Program Educational Objectives underwent substantial revision during the pre-preparation phase of this self-study. These PEOs were proposed by Undergraduate Curriculum Committee in the spring 2011 semester, and formally by the faculty in the fall 2011 semester. The PEOs are to be assessed annually by the Undergraduate Curriculum Committee, with input from the Industry Advisory Board. These PEOs have not yet undergone a periodic review.

## **CRITERION 3. STUDENT OUTCOMES**

### **A. Student Outcomes**

List the student outcomes for the program and indicate where they are documented.

The Sam Houston State Computer Science Program will enable students to achieve, by the time of graduation:

- (a) An ability to apply knowledge of computing and mathematics appropriate to the discipline
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) An ability to function effectively on teams to accomplish a common goal
- (e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- (f) An ability to communicate effectively with a range of audiences
- (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society
- (h) Recognition of the need for and an ability to engage in continuing professional development
- (i) An ability to use current techniques, skills, and tools necessary for computing practice.
- (j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- (k) An ability to apply design and development principles in the construction of software systems of varying complexity.

These Student Outcomes are documented on the departmental web page.

### **B. Relationship of Student Outcomes to Program Educational Objectives**

Describe how the student outcomes prepare graduates to attain the program educational objectives.

PEO1 delineates the primary areas of employment in which our graduates will be equipped to develop successful careers. Development of each Student Outcome will facilitate greater success in their chosen careers.

PEO2 is related to the technical computer science skills that the graduates will possess. Student Outcomes (a), (b), (c), (i), (j), and (k) are directly related to development of these skills and attributes.

The professional skills described in PEO3 (teamwork, communication, and ethics) are directly related to Student Outcomes (d), (e), and (f).

The professional development and acquisition of new skills to remain relevant in a fast changing environment described by PEO4 is directly related to Student Outcomes (g) and (h).

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

Describe the process used for establishing and revising student outcomes.

Student outcomes are assessed annually by the Undergraduate Curriculum Committee, by comparing with the current ABET criteria. Because of the change from the previous standards-based criteria to the new CAC criteria, the SOs underwent substantial revision during the pre-preparation phase of this self-study. In view of the ABET assessment criteria, it was deemed most effective to adopt Criterion 3(a)-(k) as our Student Outcomes. Because of this we do not expect that these will be revised unless there is either a change in the ABET CAC Criteria or a major change in our departmental emphasis.

**D. Enabled Student Characteristics**

For any of the characteristics a) through i) as well as any program specific characteristics that are not addressed by the student outcomes, indicate how the curriculum enables these student characteristics.

<i>Student Outcome</i>	<i>Enabling Courses</i>
(a)	COSC 1436, 1437, 2319,2347,3318,3319,4319
(b)	COSC 1437, 3318,3319,4319
(c)	COSC 3318,3319,4318,4319
(d)	COSC 4319
(e)	COSC 4319,4349
(f)	COSC 4319,4349
(g)	COSC 4319,4349
(h)	COSC 4319,4349
(i)	COSC 1436, 1437, 2319,2347,3318,3319,4319
(j)	COSC 1437, 3319,4319
(k)	COSC 1437, 3318,3319,4319

## **CRITERION 4. CONTINUOUS IMPROVEMENT**

This section of your self-study report should document your processes for regularly assessing and evaluating the extent to which the program educational objectives and student outcomes are being attained. This section should also document the extent to which the program educational objectives and student outcomes are being attained. It should also describe how the results of these processes are being utilized to effect continuous improvement of the program.

Assessment is defined as one or more processes that identify, collect, and prepare the data necessary for evaluation. Evaluation is defined as one or more processes for interpreting the data acquired through the assessment processes in order to determine how well the program educational objectives and student outcomes are being attained.

Although the program can report its processes as it chooses, the following is presented as a guide to help you organize your self-study report. It is also recommended that you report the information concerning your program educational objectives separately from the information concerning your student outcomes.

### **A. Program Educational Objectives**

It is recommended that this section include (a table may be used to present this information):

1. A listing and description of the assessment processes used to gather the data upon which the evaluation of each the program educational objective is based. Examples of data collection processes may include, but are not limited to, employer surveys, graduate surveys, focus groups, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program.
2. The frequency with which these assessment processes are carried out
3. The expected level of attainment for each of the program educational objectives
4. Summaries of the results of the evaluation processes and an analysis illustrating the extent to which each of the program educational objectives is being attained
5. How the results are documented and maintained

The Department's assessment process defines the steps for: assessing various indicators of the quality of the program offered, relative to the needs of our constituencies; evaluating the results produced by the assessment process in order to identify strengths, as well as problem areas in need of improvement; and "closing the loop", so that appropriate program revisions may be identified and implemented.

Additionally, the effectiveness of the assessment process itself is reviewed, to ensure that it is serving its purposes.

The program implemented assessment processes beginning fall 2007. These processes have undergone refinement during the past five years in order to a) extend assessment to include data supporting appropriate professional preparation and career and professional accomplishments, b) to move from relatively informal to formal assessment processes and c) to align with the new PEO's identified by ABET/CAC. For the years 2007-2011 summary

assessment documentation is provided as part of this self-study. 2011/12 assessment data is currently being compiled and will be available during the site visit.

The current assessment process was formally adopted by the CS Department faculty in the Spring 2012 semester, as a result of the assessment of the inadequacy of the previous assessment process adopted in 2005.

The assessment of PEOs is done using the following instruments:

- (a) Employer survey (included in the supporting documents)
  - a. Survey to be performed in the spring semester of even-numbered years
  - b. Expected level of attainment: 70% of employers responding to the employer survey indicate their satisfaction with the graduates' attainment of PEO1 – PEO4.
  
- (b) Alumni survey (included in the supporting documents)
  - a. Survey to be performed in the spring semester of odd-numbered years
  - b. Expected level of attainment: 70% of alumni responding to the alumni survey indicate their satisfaction with their attainment of PEO1 – PEO4.
  
- (c) Computer Science advisory board meetings (minutes to be provided at time of team visit)
  - a. The advisory board will assess the appropriateness of the PEOs annually in the Fall, and make suggestions for revision to the faculty.
  - b. There will be an ad hoc evaluation, with no specific action point.

## **B. Student Outcomes**

It is recommended that this section include (a table may be used to present this information):

1. A listing and description of the assessment processes used to gather the data upon which the evaluation of each student outcome is based. Examples of data collection processes may include, but are not limited to, specific exam questions, student portfolios, internally developed assessment exams, senior project presentations, nationally-normed exams, oral exams, focus groups, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program.
2. The frequency with which these assessment processes are carried out
3. The expected level of attainment for each of the student outcomes
4. Summaries of the results of the evaluation process and an analysis illustrating the extent to which each of the student outcomes is being attained
5. How the results are documented and maintained

## Assessment Plan for Student Outcomes

Student Outcome	Evaluation Instrument	Frequency	Expected Attainment Level	Where Documented
a	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
b	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
c	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
d	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
e	Targeted exam questions in COSC 4349 (Professionalism and Ethics)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Ethics faculty will report results to the Undergraduate Curriculum committee. Report will be attached to the UCC minutes.
f	Targeted exam questions in COSC 4349 (Professionalism and Ethics)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Ethics faculty will report results to the Undergraduate Curriculum committee. Report will be attached to the UCC minutes.
g	Targeted exam questions in COSC 4349 (Professionalism and Ethics)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Ethics faculty will report results to the Undergraduate Curriculum committee. Report will be attached to the UCC minutes.

h	Targeted exam questions in COSC 4349 (Professionalism and Ethics)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Ethics faculty will report results to the Undergraduate Curriculum committee. Report will be attached to the UCC minutes.
i	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
j	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes
k	Project/Presentation evaluation in COSC 4319 (Software Engineering)	every semester	70% of students will score at a level of 3.0 average on 4 point evaluation rubric	Software engineering evaluation committee report to the Undergraduate Curriculum committee will be attached to the UCC minutes

### C. Continuous Improvement

Describe how the results of evaluation processes for the program educational objectives and the student outcomes and any other available information have been used as input in the continuous improvement of the program. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes.

The assessment plan was approved in the Fall 2011 semester and was implemented in the Spring 2012 semester. The results will be evaluated in August 2012 by the Undergraduate Curriculum committee.

### D. Additional Information

Copies of any of the assessment instruments or materials referenced in 4.A, 4.B, or 4.C must be available for review at the time of the visit. Other information such as minutes from meetings where the assessment results were evaluated and where recommendations for action were made could also be included.



## CRITERION 5. CURRICULUM

### A. Program Curriculum

1. Complete Table 5-1 that describes the plan of study for students in this program including information on course offerings in the form of a recommended schedule by year and term along with average section enrollments for all courses in the program over the two years immediately preceding the visit. State whether you are on quarters or semesters and complete a separate table for each option in the program.

Credits are based on semester hours. See Table 5-1.

2. Describe how the curriculum aligns with the program educational objectives.

The Computer Science curriculum provides students with basic knowledge and skills, as defined by the Program Educational Objectives. Through the lower division required courses as well as Calculus I & II, and the required 16 hours of lab science in two separate fields, the curriculum provides students with the basic mathematical and science framework. Through the upper division required courses, the curriculum builds upon the fundamental principles of computer science for more advanced study. The upper division select electives provide students with additional breadth and/or depth in computer science in a particular area of emphasis. Through the required senior Software Engineering course students demonstrate their abilities to apply the knowledge and skills they acquired. The curriculum is thus consistent with both the defined Program Educational Objectives and Student Outcomes.

3. Describe how the curriculum and its associated prerequisite structure support the attainment of the student outcomes.

In addition to the discussion in paragraph 2 above, the prerequisites for each course have been specifically implemented so that upper-level material builds upon the foundation of previous required courses.

4. Attach a flowchart or worksheet that illustrates the prerequisite structure of the program's required courses.

Flow charts detailing the prerequisite structure for each concentration are provided as a separate attachment.

5. For each curricular area specifically addressed by either the general criteria or the applicable program criteria as shown in Table 5-1, describe how your program meets the specific requirements for this program area in terms of hours and depth of study

The SHSU Computer Science program meets the specific requirements in terms of hours and depth in the following way:

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

1. Coverage of the fundamentals of algorithms, data structures, software design, concepts of programming languages and computer organization and architecture.
2. An exposure to a variety of programming languages and systems.
3. Proficiency in at least one higher-level language.
4. Advanced course work that builds on the fundamental course work to provide depth.

b. One year of science and mathematics:

1. Mathematics: At least one half year that must include discrete mathematics. The additional mathematics might consist of courses in areas such as calculus, linear algebra, numerical methods, probability, statistics, number theory, geometry, or symbolic logic.
2. Science: A science component that develops an understanding of the scientific method and provides students with an opportunity to experience this mode of inquiry in courses for science or engineering majors that provide some exposure to laboratory work.

- 1) The computer science program requires 41 semester hours of appropriate computer science or digital forensic courses; thus it fulfills the requirement of one and one-third years.
  - a) Fundamental coverage of algorithms, data structures, software design, concepts of programming languages, and computer organization and architecture are covered in the following core courses:
    - i) COSC 1436
    - ii) COSC 1437
    - iii) COSC 2319

- b) An exposure to a variety of languages and systems is covered in the following core courses
    - i) COSC 2347
    - ii) COSC 4318
    - iii) COSC 3318
  - c) Proficiency in at least one higher level language
    - i) COSC 1436 -- Java
    - ii) COSC 1437 -- Java
    - iii) And advanced courses that build on Java
  - d) Advanced course work that builds on the fundamental course work to provide depth
    - i) COSC 3319
    - ii) COSC 4319
    - iii) And the advanced Selective Electives for the various emphases in the program
- 2) The computer science program requires 17 hours of Mathematics 16 hours of laboratory science for a total of 33 hours of mathematics and science; thus it fulfills the requirement of one year of science and mathematics, at least one half year of mathematics, and it includes the required discrete mathematics topics
- a) Mathematics
    - i) MATH 1420 – Calculus I
    - ii) MATH 1430 – Calculus II
    - iii) MATH 2395 – Discrete Mathematics
    - iv) MATH 3379 – Statistics
    - v) MATH upper level elective
  - b) Science
    - i) 8 hours (2 courses) of Lab science from one field
    - ii) 8 hours (2 courses) of Lab science from a second field

6. If your program has a capstone or other culminating experience for students specifically addressed by either the general or program criteria, describe how this experience helps students attain the student outcomes.

Not applicable.

7. If your program allows cooperative education to satisfy curricular requirements specifically addressed by either the general or program criteria, describe the academic component of this experience and how it is evaluated by the faculty.

Not applicable.

8. Describe by example how the evaluation team will be able to relate the display materials, i.e. course syllabi, textbooks, sample student work, etc., to each student outcome. (See the 2011-2012 APPM section II.G.6.b.(2) regarding display materials.)
  - Each syllabus in the display will have the Departmental/ABET Student Outcomes (a)-(k).
  - The course sequence or content section will be annotated identifying whether that content has direct relevance to a Student Outcome.
  - Each assignment in the folder identifies the Primary Student Outcome associated when applicable.
  - The table of contents in the display text books will be annotated with the same connection.
  - Graded examples of work will contain reference to the Student Outcomes.

#### **B. Course Syllabi**

In Appendix B, include a syllabus for each course used to satisfy the mathematics, science, and discipline-specific requirements required by Criterion 5 or any applicable program criteria. For required courses with multiple sections that do not use a common syllabus, please include a syllabus for each of the different sections.

**Table 5-1 Curriculum**

Program Name

Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selective Elective by an R, an E or an SE <sup>2</sup>	Curricular Area (Credit Hours)				Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered <sup>1</sup>
		Math & Basic Sciences	Computing Topics Mark with an F or A for Fundamental or Advanced	General Education	Other		
COSC 1436 Programming Fundamentals I	R		4F			Fall 2011 / Spring 2012	18.4
COSC 1437 Programming Fundamentals II	R		4F			Fall 2011 / Spring 2012	13.4
COSC 2319 Computer Organization and Machine Language	R		3F			Fall 2011 / Spring 2012	28.5
COSC 2347 Special Topics/Programming	R		3F			Fall 2011 / Spring 2012	37.5
COSC 3318 Data Base Management Systems	R		3A				35
COSC 3319 Data Structures and Algorithms	R		3A			Fall 2011 / Spring 2012	34.5
COSC 4318 Programming Languages	R		3A			Fall 2011 / Spring 2012	18.5
COSC 4319 Software Engineering	R		3A			Fall 2011 / Spring 2012	17.5
COSC 4349 Professionalism and Ethics	R		3A			Fall 2011 / Spring 2012	19.5
MATH 2395 Discrete Mathematics	R	3				Fall 2011 / Spring 2012	28
COSC 2327 Introduction to Computer Networks	SE		3F			Fall 2011 / Spring 2012	19.5

COSC 3331 Human-Computer Interaction	E		3A			Spring 2011 /Spring 2012	22
COSC 3337 Information System Design	SE		3A			Spring 2011 /Spring 2012	12
COSC 4349 Compiler Design	SE		3A			Spring 2011 /Spring 2012	14
COSC 4326 Network Theory	SE		3A			Spring 2011 /Spring 2012	12
COSC 3327 Computer Architecture	SE		3A			Fall 2011 /Fall 2012	19
COSC 3327 Computer Operating Systems	SE		3A			Fall 2011 /Fall 2012	12
DFSC 1317 Introduction to Digital Forensics	SE		3F			Fall 2011 /Spring 2012	16
DFSC 2317 Network Security	SE		3F			Fall 2011 /Spring 2012	19
DFSC 3317 Cryptography	SE		3A			Fall 2011 /Spring 2012	21.2
DFSC 4317 Information Security	SE		3A			Spring 2011 /Spring 2012	15.5
DFSC 3320 Digital Forensics Tools	E		3A			Spring 2011 /Spring 2012	20
MATH 1420 Calculus I	R	4				Fall 2011 /Spring 2012	34
MATH 1430 Calculus II	R	4				Fall 2011 /Spring 2012	31.5
MATH 3379 Statistics	R	3				Fall 2011 /Spring 2012	14.7
MATH upper level elective	R	3					N/A
Lab science (2 courses from one field)	R	8					N/A
Lab science (2 courses from a second field)	R	8					NA
Component Area I (Communication)	R				6		N/A
Component Area IV (Visual/Performing Arts)	R				3		N/A
Component Area IV (Cultural Studies)	R				3		N/A
Component Area IV (Literature or Philosophy)	R				3		N/A

Component Area V (Social/Behavioral Sciences)		R			18			
KINE 2115 Fitness for Living		R			1			
<i>Add rows as needed to show all courses in the curriculum.</i>								
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE		120						
PERCENT OF TOTAL			27.5%	36.6%	28.3%			

1. For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the average enrollment in each element.
2. Required courses are required of all students in the program, elective courses are optional for students, and selected electives are courses where students must take one or more courses from a specified group.

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

## **CRITERION 6. FACULTY**

### **A. Faculty Qualifications**

Describe the qualifications of the faculty and how they are adequate to cover all the curricular areas of the program and also meet any applicable program criteria. This description should include the composition, size, credentials, and experience of the faculty. Complete Table 6-1. Include faculty resumes in Appendix B.

The department employs 11 tenured/tenure track faculty members and one Instructor to teach in the computer science program. Each of the tenures/tenure track faculty members has a terminal degree in the field with the exception of the department chair, who has a terminal degree in Higher and Adult Education with fields of study in Computer Science and Statistics. The Instructor has a Master of Science in Engineering Science and Systems. The department also employs one tenure track faculty member who does not teach in the computer science, and an additional Instructor who teaches exclusively service courses to the university community.

The departmental faculty members display a range of experiences including high school, undergraduate and graduate teaching, academic research, and computer science consulting for government and business and industry. The length of experiences ranges from 1 year to 34 years with a balanced blend between.

Two faculty members (Dr. Burris and Dr. Cooper) are full professors with tenure, three are tenured Associate Professors with the remainder probationary faculty.

### **B. Faculty Workload**

Complete Table 6-2, Faculty Workload Summary and describe this information in terms of workload expectations or requirements for the current academic year.

Most faculty members are required to teach 9 credit hours per semester with the following exceptions:

- Dr. Cooper, as department chair teaches five courses per year, including summer
- Dr. Shannon (who does not teach in the program) teaches five courses per year. She has one course release per year as the College of Sciences Academic Community Engagement Coordinator.
- Dr. McGuire elected to teach four courses per semester in lieu of maintaining an active research program.

### **C. Faculty Size**

Discuss the adequacy of the size of the faculty and describe the extent and quality of faculty involvement in interactions with students, student advising, and oversight of the program.

The size of the faculty is adequate to meet programmatic requirements and allows the department to schedule multiple of sections of critical courses (CS1, CS2, Computer



Organization, and others). As a result we are generally able to keep section numbers in those courses at or below 20, allowing the faculty and students a good opportunity to develop strong relationships. In addition faculty members are actively engaged in a range of student activities including the ACM student chapter, community engagement activities, annual robotics competitions and an annual student led conference for high school students.

All tenured/tenure track faculty members are assigned advisees from the undergraduate student body with the exception of Dr. Ji, who is the graduate advisor for the department and only advises graduate students, and Dr. Shannon, who does not teach in the computer science program. In addition, the department chair does not assign advisees to incoming faculty for a period of two years in order to allow the faculty member to become sufficiently familiar with the students, the program requirements and the university.

The faculty body is essentially self-governing, with the department chair acting as leader and administrator rather than as a director of operations. The faculty body is responsible for program oversight, curriculum development, assessment, and quality control.

#### **D. Professional Development**

Describe the professional development activities that are available to faculty members.

Faculty members are allocated funds to support travel to conferences, workshops and other professional development activities. Faculty members are actively engaged as journal editors, book editors, and officers in professional organizations.

The university provides mentoring and other support for improving teaching performance through the Professional and Academic Center for Excellence (PACE).

The department, in compliance with university policy has implemented an annual Faculty Evaluation System that assesses teaching performance, research efforts and service to the department, university, profession, and the wider community. This process results in potential merit pay increases, and provides evidence in promotion and tenure decisions.

#### **E. Authority and Responsibility of Faculty**

Describe the role played by the faculty with respect to course creation, modification, and evaluation, their role in the definition and revision of program educational objectives and student outcomes, and their role in the attainment of the student outcomes. Describe the roles of others on campus, e.g., dean or provost, with respect to these areas.

The faculty members in the department have control over the curriculum development process through the department's curriculum committee. The committee reports progress regularly to the department through monthly department meetings and accepts input to their deliberations at that point.

Once curriculum changes have been identified, they are submitted through the department chair to the College Curriculum Committee, whose primary responsibilities are to ensure quality control, avoidance of course duplication, and compliance with university and coordinating board policy. Once approved curriculum changes are processed through the university curriculum committee with similar responsibilities. The university's curriculum development is ratified by the Academic Affairs Council, which is comprised of all university department chairs, associate Deans, Deans, Academic Associate vice Presidents and the Provost.

**Table 6-1. Faculty Qualifications**

Computer Science

Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academic Appointment <sup>2</sup> T, TT, NTT	FT or PT <sup>4</sup>	Years of Experience			Professional Registration/ Certification	Level of Activity H, M, or L		
					Govt./Ind. Practice	Teaching	This Institution		Professional Organizations	Professional Development	Consulting/summer work in industry
Peter A Cooper	PhD, Higher & Adult Education, 1993	P	T	FT	0	37	15		M	M	H
David S. Burris	PhD Computer Science-1976	P	T	FT	2	41	34		L	L	H
Timothy J. McGuire	PhD Computer Science, 1991	ASC	T	FT	0	33	13		H	L	L
Jiahuang Ji	PhD Computer Science, 1990	ASC	T	FT	1	30	22		L	L	L
Gary W. Smith	PhD-Computer Science, 1998	ASC	T	FT	1	20	14		L	M	L
Lei Chen	PhD Computer Science, 2007	AST	TT	FT	0	5	5		H	H	L
Narishima K. Shashidhar	PhD- Computer Science, 2010	AST	TT	FT	0	2	2		M	H	L
Qingzhong Liu	PhD Computer Science, 2007	AST	TT	FT	3	2	2		M	H	L
Cihan Varol	PhD Applied Computing, 2009	AST	TT	FT	0	3	3		H	H	L

Hyuk Cho	PhD Computer Science, 2008	AST	TT	FT	0	4	4		H	H	L
Li-Jen Shannon	EdD Higher education Executive Leadership	AST	TT	FT	0	9	9		M	H	L
Hacer Varol	M.S. Applied Science, 2011	I	NTT	FT	6	1	1		L	L	L
Jenny Zhou	PhD Computer Science, 2012	AST	TT	FT	0	0	0		N/A	N/A	N/A

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

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

**Table 6-2. Faculty Workload Summary**

Computer Science

Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>21</sup>	Program Activity Distribution <sup>3</sup>			% of Time Devoted to the Program <sup>5</sup>
			Teaching	Research or Scholarship	Other <sup>4</sup>	
Peter Cooper	FT			25	75	25
David Burris	FT	COSC 1437 (4), COSC 2347 (3) COSC 3319 (3)	83	0	17	83
Jiahuang Ji	FT	COSC 4319 (3)	25	25	50	50
Timothy McGuire	FT	COSC 1436 (4), COSC 2329 (3)	58	25	17	83
Ken T. Hartness	FT	COSC 1436 (4) COSC 3331 (3) COSC 3337 (3)	75	0	25	75
Gary Smith	FT	COSC 4316 (3), COSC 4318 (3)	66	25	9	91
Hyuk Cho	FT	COSC 1437 (4), COSC 4326 (3)	58	25	17	83
Lei Chen	FT	DFSC 4317 (3)	25	25	50	50
Narishima Shashidhar	FT	DFSC 1317 (3)	25	25	50	50
Qingzhong Liu	FT	COSC 2327 (3), DFSC 1317 (3)	50	25	25	75
Cihan Varol	FT	DFSC 3320 (3)	25	25	50	50
Hacer Varol	FT	COSC 1436(12)	100	0	0	100
Andrew Bennett	PT	COSC 4349 (3)	25	0	75	25
Li-Jen Shannon	FT		0	25	75	0

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

<sup>1</sup> All courses are for Spring 2012.

5. Out of the total time employed at the institution.

## CRITERION 7. FACILITIES

### A. Offices, Classrooms and Laboratories

Summarize each of the program's facilities in terms of their ability to support the attainment of the program educational objectives and student outcomes and to provide an atmosphere conducive to learning.

1. Offices (such as administrative, faculty, clerical, and teaching assistants) and any associated equipment that is typically available there.

Each faculty member in the department is allocated an office that exceeds the minimum size standard as defined by the Texas Higher Education Coordinating Board. Each office is equipped with telephone, wired network and wireless network access. The offices are also equipped with computer systems administered by the university's IT department, computers and/or laptops administered by the faculty members themselves, together with a variety of mobile devices which the faculty members request.

The department employs secretarial assistance whose duties include supporting the department chair in managing departmental administration, providing teaching and research logistical support to faculty, and ensuring student and faculty compliance with university policy. The secretarial office is located centrally within the faculty offices and provides printing and duplication services.

Teaching Assistants are housed in offices with phone and computer systems available. Some of the offices are multi-user offices with two or four desks available. Others house a single TA; particularly those provide direct support for students in the CS1/CS2 sequence.

The department employs a network/system administrator with responsibility for administering and maintaining all departmental equipment. The network administrator is housed in a suite of offices providing accommodation for him and for two undergraduate assistants. The suite contains a diverse array of equipment, repair tools, etc.

2. Classrooms and associated equipment that is typically available where the program courses are taught.

The department has (almost) exclusive access to five teaching spaces. Two rooms are equipped a computer laboratories for hands on, practical work. These rooms can accommodate 20 -30 students Two rooms are arranged as small traditional lecture rooms with tiered seating. These rooms can accommodate up to 55 students. One room is arranged in a conference room style, accommodating up to 18 students.

Each room has wireless networking and presentation technology available, together with whiteboards, chalkboards, or a combination thereof. The four main rooms have available power for students' laptops. The rooms provide sufficient space to accommodate the fall and spring schedules with room utilization at about 70%.

3. Laboratory facilities including those containing computers (describe available hardware and software) and the associated tools and equipment that support instruction. Include those facilities used by students in the program even if they are not dedicated to the program, and state the times they are available to students. Complete Appendix C containing a listing the major pieces of equipment used by the program in support of instruction.

Computer Science has two datacenters supporting the department. One is a secured facility housing our departmental critical infrastructure, and the other is open for use by students for project work and research on a reservation only basis. The first data center houses the department's Active Directory Domain Controller (CSlabs.local domain), Intranet web portal, SANs and storage servers, and "virtual farm". All of the operating systems are running the 64 bit version where available, and have at exceed the minimum system specifications for each OS, and in most cases exceed the recommended specifications. There are three labs connected directly to the domain (department critical infrastructure), two of which are configured as computer integrated classrooms and one is left strictly for student use.

Our virtual farm is an ESXI 4.0 based server cluster for hosting virtual machines which are available to the students via a lab-based v-sphere connection. The cluster has recently been updated and consolidated to the latest VMware certified hardware. The cluster has 24 cores at 2.9 gigahertz each and 128 gigabytes of RAM available for provisioning to virtual machines. This means that our students can run more than 200 virtual machines at full load per virtual machine and over 1000 virtual machines at a nominal 25% load. The most common uses of these systems is to learn about malware, conduct system attacks and IDS defenses, and give the student's the ability to have root on a variety of operating systems. All of the systems connected to the department's critical infrastructure are segmented from the main campus network to allow our students the freedom to explore without endangering the main campus networks and systems. The second data center is located in our White Hall facility across campus from the main department and it houses a host of windows and Linux servers which can be provisioned according to the needs of the individual project for whom the facility has been reserved. This datacenter also has an independent data connection to facilitate malware research initiatives, such as standing up honey nets. Additionally there is a 28-seat lab connected to this second datacenter, which can be used to practice any activity or simulate any given scenario the students might want to leverage.

## **B. Computing Resources**

Describe any computing resources (workstations, servers, storage, networks including software) in addition to those described in the laboratories in Part A, which are used by the students in the program. Include a discussion of the accessibility of university-wide computing resources available to all students via various locations such as student housing, library, student union, off-campus, etc. State the hours the various computing facilities are open to students. Assess the adequacy of these facilities to support the scholarly and professional activities of the students and faculty in the program.



### Laboratories

Computer Services has 14 computer labs across campus, manned by more than 60 lab assistants. These labs are equipped with CD-ROM's, CD-burners, scanners, printers, USB ports for access with flash/pin drives, and other peripheral items. These computer labs are available to enrolled students, faculty, and staff.

Two labs provide 24-hour access. Computer science has preferred access to three computer labs on campus for use in scheduled class sessions seating a total of 120 students. All faculty members have access to computer equipment in their office, renewed on a three-year rotation.

### Network

The university provides wired and wireless network access across campus and to the Internet. Wired networking is supported through a distributed server structure with Gigabit inter-server communication over fiber. The university provides an OC-12 line for Internet access with opportunities for departments to request dedicated pipes. The wireless network supports both anonymous access to the Internet and VPN access to the university intranet.

The university provides remote access for students and faculty to the university intranet and all campus computer services.

All dorm rooms on campus are wired for access to the university network. All classroom used by computer science have wired network access at the front of the classroom and wireless access for student computer use.

### Support

Institutional support for computer facilities is effected in a number of ways. In laboratories, a trained lab assistant is available at all time. The university runs 24/7/365 telephone support to the campus community. The university also provides in situ trouble shooting through a centralized work order and response system.

### Software

The university provides a wide range of applications for both general and specialized use including IDE's ( e.g. .NET, Borland) compilers, interpreters, office applications, etc. Computer Services tests, validates, and installs additional software on request from the department and no cost.

The university provides remote access to both the application suites and to student and faculty resources remotely. As a result, students are able to use the same resources off campus and on.

The university is a Redhat Linux distribution mirror and provides ISO distributions on demand. The university is a member of NetNet, a statewide community of universities providing support and access to distance education facilities. Once Distance Education

facility, containing interactive TV facilities through NetNet is available in the Computer Science department office and classroom

### **C. Guidance**

Describe how students in the program are provided appropriate guidance regarding the use of the tools, equipment, computing resources and laboratories.

### **D. Maintenance and Upgrading of Facilities**

Describe the policies and procedures for maintaining and upgrading the tools, equipment, computing resources and laboratories used by students and faculty in the program.

The department operates a consultative process for establishing acquisition and maintenance requirements for our computer facilities. Faculty members are requested to provide information regarding their needs at the beginning of the spring semester each year. The request includes university facilities, software and hardware for both classroom and office use.

The requests are then costed and prioritized at the departmental level. This prioritized list then forms the basis for a capital equipment request to the Dean of Sciences.

All computer equipment requests for non-research purposes are processed and funded through the University IT department. This includes faculty, TA and departmental office equipment. In addition, the IT department replaces the equipment in the two teaching laboratories. All computer equipment is on a three-year rotation.

At the tactical level the adequacy of facilities is assessed in a relatively informal manner. Department meeting agendas typically include an item on equipment requests or facilities. On an ad hoc basis, the departmental office receives comments concerning the adequacy (most often inadequacy) of facilities and handles those comments appropriately.

At the strategic level, the department collects data through its assessment processes from graduating seniors (senior exit survey) and from alumni (alumni survey) including views concerning the adequacy of laboratory facilities and the quality of access to those facilities.

In the last round of assessment data analysis this has resulted in the department providing a virtual farm to support multiple operating systems with state-of-the-art sandboxing and rollback capabilities, together with enhanced quality projection in the classrooms.

### **E. Library Services**

Describe and evaluate the capability of the library (or libraries) to serve the program including the adequacy of the library's technical collection relative to the needs of the program and the faculty, the adequacy of the process by which faculty may request the library to order books or subscriptions, the library's systems for locating and obtaining

electronic information, and any other library services relevant to the needs of the program.

The Library has a wide-ranging collection of books and periodicals that currently support Computer Science and Information Assurance and Security. The following is a selected list of resources which currently support both programs: The Digital Library Core Package (43 journal titles) of the Association of Computing Machinery (ACM), the IEEE Computer Society Digital Library (22 peer reviewed journals), the SAFARI electronic reference collection for programming and IT professionals; EBSCO's Academic Search Premier full text access to academic journals with links to many of the Library's electronic journal subscriptions; Westlaw Campus electronic access to cases from state and federal courts; Lexis-Nexis Academic Universe electronic access to law reviews and court cases; Criminal Justice Periodical Index full text access to criminal justice topics.

As Computer Science, and in particular information assurance are relative volatile areas, the library is willing to carefully monitor potential resources for publications in the field and will order appropriate monographs. The Library has identified three journals for procurement for the information assurance side the program: Computer Fraud and Security (\$933), Digital Investigation: International Journal of Digital Forensics and Incident Response (\$650), Computer Law and Security (\$1,049). The Library's student use fee is used to purchase titles as necessary. Interlibrary loan and document delivery is monitored to identify additional journals and monographs that need to be added to the collection.

All Texas state institutions and many private universities participate in TexShare, a cooperative resource sharing program which permits borrowers in good standing at their home institution to obtain books on-site at participating institutions. TexShare also provides access to a core collection of 48 electronic databases; the majority of these databases contain full-text. Sam Houston State University is also a member of AMIGOS and OCLC, which enable the Library to provide students and faculty with an array of information resources through interlibrary loan. The members of The Texas State University System developed a cooperative program to provide ScienceDirect, an electronic resource that provides access to scholarly journals in the sciences and behavioral sciences. The Library also provides access to Kulwer Online through agreement with independent colleges and universities in Texas; this database provides journals in the sciences and the behavioral sciences. These types of consortial arrangements expand access to scholarly journals.

The library periodically requests information for the department and from individual faculty for potential acquisitions in the content area.. At the time of preparation of this self-study, there has not been an instance of the library being unable or unwilling to procure library resources at whatever levels the department requests.

The library offers ongoing training for both students and faculty in the use of traditional and electronic resources including reference management.

## **F. Overall Comments on Facilities**

Describe how the program ensures the facilities, tools and equipment used in the program are safe for their intended purposes (See the 2011-2012 APPM II.G.6.b.(1)).

The university conducts periodic review by the University's safety officer to ensure that safety standards are maintained including room and building capacity, electrical and other wiring, equipment safety etc.

These reviews are supported in a number of ways. The university's scheduling software limits course capacity to at or below the designated room capacity. Department chairs have the authority to lower, but not to raise that capacity. All electrical and computing equipment is authorized by the university's IT department which reviews purchases for safety compliance, university policy compliance and cost. The computer sciences department's Network Manager is responsible for identifying, notifying, and correcting equipment safety issues.

## CRITERION 8. INSTITUTIONAL SUPPORT

### A. Leadership

Describe the leadership of the program and discuss its adequacy to ensure the quality and continuity of the program and how the leadership is involved in decisions that affect the program.

The department of computer science is a separate department within the College of Science. The department chair has a 15-hour per year course load with the remainder of his time allocated to research and departmental administration. The department chair is retained for 12 month rather than the typical 9-month faculty contract and may allocate his teaching load in any combination throughout the 12-month period. The department chair has open access to the Dean of the College of Science, as well as the University Provost, and the Associate Vice President for Graduate Studies.

### B. Program Budget and Financial Support

Describe the process used to establish the program's budget and provide evidence of continuity of institutional support for the program. Include the sources of financial support including both permanent (recurring) and temporary (one-time) funds.

Each year (spring) the department chair provides a budget request to the dean of the college. The budget includes

- budget corrections from the prior funding year
- Fixed cost maintenance & license needs
- Computers and Instructional Technology requests
- Operational resource requests (lab maintenance and worker wages)
- Capital Equipment.

From this budget request, the Dean constructs a consolidated college request that is forwarded to the Provost and the vice president for Finance for amendment/approval. The budge allocation is then returned to the department in August prior to the start of the new fiscal year on September 1<sup>st</sup>.

The department administers a budget of approximately \$1.2 million covering personnel, equipment, travel, and office management.

Outside of personnel costs the department receives funding from a number of sources:

- Capital Equipment: Faculty members are requested to provide information to the department chair each spring semester concerning capital outlays. The Capital Equipment allocation is issued in the fall semester of the following academic year. The department chair is responsible for the application of those funds to the priority list with some discretion as priorities and costs might change in the interim. Typically the capital equipment allocation is in the range of \$40,000 -

\$60,000 although it is variable, dependent upon the departmental request.

- Operations and Management: The department receives an Operations and Management budget, which is used to provide some support on small cost items to supplement the capital equipment allocation, to pay student workers, and to provide for supplies, faculty travel, and office equipment rental. The O&M allocation for the past two years were \$96,000 (10/11) and \$96,500 (11/12) respectively.
- Online Course Fees: The department receives approximately \$32,000 per year in fees collected through DELTA the SHSU Online unit. These fees are used to support online education, including maintenance of the department's virtual farm.
- Grant funds: These are procured ad hoc. Grant funds provided in excess of 350,000 in the past two years, and approximately \$5 million in the past 10 years.
- Centrally allocated fund: These are allocated ad hoc and include in the past year the procurement of 3D printing technology and a forensic Media duplicator.

1. Describe how teaching is supported by the institution in terms of graders, teaching assistants, teaching workshops, etc.

The College allocates funds to the Computer Science department annually to support the employment of hourly-paid student workers and graduate assistants. For FY 2012/13 the department received \$4,000 to for hourly-paid student workers and \$78,768 for graduate assistants. This allows the department to hire 8 graduate assistants at an annual stipend of \$9,800 for 20 hours per week during the regular semesters.

The hourly-paid workers provide technical support and maintenance for our classroom/laboratories and the department's Virtual Farm.

The graduate assistants provide teaching support for faculty members both inside the classroom and outside. In addition two graduate assistants act as mentors for students the CS1/CS2 sequence providing coverage for 40 hours per week.

The Office of Graduate studies provides ad hoc funding to support graduate students when travelling to conferences to present research. In FY2011/12 this amounted to \$4,500.

The College of Science offers annual \$1000 scholarships to any graduate students with a GRE score in excess of 1000 and a GPA in excess of 3.0. This allows international students to receive in-state tuition. The department does not accept graduate students with GRE's below 1000. As a result, all graduate students are eligible to receive the

scholarship.

2. To the extent not described above, describe how resources are provided to acquire, maintain and upgrade the infrastructures, facilities and equipment used in the program. Assess the adequacy of the resources described in this section with respect to the students in the program being able to attain the student outcomes.

The Information Technology department maintains all computer equipment within the department with the exception of the Virtual Farm. IT schedules rotation of office, laboratory and other computer systems on a three-year basis with no cost to the department. The computer science department also receives all decommissioned computer equipment for use in special projects. The department refurbishes between 20 and 30 machines per year for distribution to local school districts.

### **C. Staffing**

Describe the adequacy of the staff (administrative, instructional, and technical) and institutional services provided to the program. Discuss methods used to retain and train staff.

The department currently has 14 full time teaching personnel (12 full time tenure/tenure track positions and 2 Instructor positions). This is sufficient to offer all lower division required computer science classes each semester, all upper division required classes and all electives at least annually. In addition, the department has one tenure track position and one lecturer position open to allow for necessary expansion.

The department employs one full time administrative assistant. This is adequate at the moment.

The department employs one network manager and two hourly paid student workers to manage departmental computing resources. This is adequate for the moment.

The department is in the process of significant programmatic development including a collaborative degree program in Software Engineering with a university in Turkey, a collaborative degree program in computing engineering technology with the Industrial Technology and Physics programs on campus, a doctoral program in Digital Forensic Science, and providing support courses for a proposed doctoral program in Educational Technology. These developments would necessitate significant increases in all types of staff and the planning processes have identified the required additional personnel.

The university offers training programs for non-technical staff. The PACE Center (Professional and Academic Center for Academic Excellence) offers support, particularly to new instructional staff in planning, structuring and improving instruction. The office of Academic Affairs offers programs, again for new faculty in managing the administrative process, and guidelines and support during a faculty members probationary period.

The department has a coherent performance evaluation process for the instructional, research

and service components of a faculty member's workload. This process includes student evaluation of classroom performance, twice annual classroom observation by the department chair, and an university defined rubric for assessing teaching, research, and service for the purpose of formative and summative evaluation and feedback, identification of appropriate meritorious improvements in salary, and providing documentation for tenure decisions.

The university provides regular face-to-face and online training opportunities for administrative staff, including the use of the Banner computer-based accounting, purchasing, admissions, advising, human resources, and travel functions.

Staff retention is effected through both formal and informal methods. The Faculty Evaluation System, and its administrative staff equivalent, provides annual feedback on performance allowing positive reinforcement and self-reflection. The FES process is also used to improve salaries annually.

#### **D. Faculty Hiring and Retention**

1. Describe the process for hiring of new faculty.

The faculty hiring process adheres to university policy. Each year the department submits a request for personnel to the administration. Open positions are then registered with Human Resources. Advertisizing copy, typically in the Chronicle of Higher Education and the communications of the ACM is prepared by the department and submitted to Human Resources for approval. The position announcement is then placed on the university website ([http://www.shsu.edu/~hrd\\_www/employment/](http://www.shsu.edu/~hrd_www/employment/)). A departmental committee is formed to manage and review applications. The committee submits a shortlist, usually around ten candidates who are then invited to a telephone interview. The telephone interview is used to reduce the field to 3-5 applicants who are then ranked by the committee. The department chair then reviews the ranked list and candidates are brought onto campus for an on-site interview.

The on-site interview consists of meetings with the search committee, the department chair, the Dean of the College of Science, and the Associate vice President of Research and Special Programs. Candidates are expected to teach a classroom session of their choice, and present an overview of their scholarly work.

The search committee, together with the department chair then negotiate an appropriate benefits package with the chosen candidate and makes a recommendation to the Dean of the College of Sciences to issue a an offer of employment.

2. Describe strategies used to retain current qualified faculty.

Departmental retention efforts revolve around three primary issues; providing support for scholarly activity, supporting improvements in teaching, and in rewarding excellence through the Faculty Evaluation System. In a less formal manner, the department chair strives to encourage and develop a culture of collaboration, a shared set of goals, and shared governance, in order to make clear the positive contribution each faculty member makes to the department and the university.



University retention efforts include the support of professional development (see E), and public acknowledgement of excellence in both College and university meetings. The university makes annual awards for excellence in Teaching, Research, and Service.

### **E. Support of Faculty Professional Development**

Describe the adequacy of support for faculty professional development and how such activities such as sabbaticals, travel, workshops, seminars, etc., are planned and supported.

Three units within the university are dedicated to supporting faculty development; the Professional and Academic Center for Excellence (PACE), SHSU Online (DELTA) and the Office of Research and Special Programs (ORSP). The Pace Center provides a wide range of teaching support and development opportunities. DELTA provides support services for the development of quality online programs through the provision of media and course development. ORSP maintains databases of potential grant opportunities, grant writing support, and actively seeks out potential internal and external collaborations.

The department allocates approximately \$30,000 from the Operations and Maintenance budget to support travel for scholarly purposes. In the first department meeting each fall, faculty are requested to provide information on their proposed travel to conferences etc. Travel requests are prioritized to ensure that probationary faculty members are allocated funds for at least one international and one regional conference or workshop. Additional funds are also available through ORSP and the Graduate Studies office.

The university offers sabbaticals to faculty after 7 years of service. The sabbatical may be for one semester with full pay or for one year with half pay.

The College of Humanities and Social Sciences hosts an annual conference on teaching improvement, open to all faculty and teaching assistants each fall semester.

The Provosts office hosts a series of breakfasts for new faculty members providing information on university services, processes, and policy.

### **PROGRAM CRITERIA**

Describe how the program satisfies any applicable program criteria. If already covered elsewhere in the self-study report, provide appropriate references.

The applicable program areas for the baccalaureate degree in Computer Science are:

(j) The ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

The Computing Science program requires all students to take a 17-hour sequence in mathematics including

-Calculus 1 and 2 (8 hours)

- Discrete Mathematics (3 hours)
- Probability and Statistics (3 hours)
- 3 hours of advanced mathematics.

The program core applies those mathematical foundations particularly in COSC 3319 Data Structures and Algorithms, COSC 4318 Advanced Language Translators, and COSC 4319 Software Engineering.

-In the Computer Science concentration mathematical foundations are applied in COSC 3327 Computer Architecture and COSC 4340 Computer Operating Systems.

-In the Information Systems concentration, mathematical foundations are applied in COSC 3318 Database Management Systems and COSC 4326 Networks II.

- In the Information Assurance concentration mathematical foundations are addressed in DFSC 3317 Cryptography and Steganography.

The program core addresses algorithmic processes in COSC 1437 Programming Fundamentals II, COSC 2329 Computer Organization and Machine Language, COSC 3319 Data Structures and Algorithms, and COSC 4319 Software Engineering.

- In the Computer Science concentration algorithmic processes are further addressed in COSC 4318 Advanced Language Concepts, COSC 3327 Computer Architecture, COSC 4318 Language Translators, and COSC 4327 Computer Operating Systems.

- In the Information Systems concentration algorithmic processes are addressed in COSC 4326 Networks II.

- In the Information Assurance concentration algorithmic processes are addressed in DFSC 3317 Cryptography and Steganography.

The program core addresses computer science theory in the modeling and design of computer-based systems in COSC 3319 Data Structures and Algorithms, COSC 4318 Advanced Language Translators, and COSC 4319 Software Engineering.

- In the Computer Science concentration computer science theory in the modeling and design of computer-based systems is addressed in COSC 4318 Advanced Language Concepts, COSC 3327 Computer Architecture, COSC 4318 Language Translators, and COSC 4327 Computer Operating Systems.

- In the Information Systems Concentration computer science theory in the modeling and design of computer-based systems is addressed in COSC 3318 Database Management Systems, COSC 3331 Human computer Interaction, COSC 3337 Information System Design and Management, and COSC 4326 Networks II.

- In the Information Assurance concentration, computer science theory in the modeling and design of computer-based systems is addressed in DFSC 2317 Network Security and DFSC 3317 Cryptography and Steganography.

(k) An ability to apply design and development principles in the construction of software systems of varying complexity.

The program core addresses the ability to apply design and development principles in the construction of software systems of varying complexity primarily through COSC 4319 Software

Engineering.

## APPENDICES

### **Appendix A – Course Syllabi**

Please use the following format for the course syllabi (2 pages maximum in Times New Roman 12 point font)

1. Course number and name
2. Credits and contact hours
3. Instructor's or course coordinator's name
4. Text book, title, author, and year
  - a. other supplemental materials
5. Specific course information
  - a. brief description of the content of the course (Catalog Description)
  - b. prerequisites or co-requisites
  - c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program
6. Specific goals for the course
  - a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.
  - b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
7. Brief list of topics to be covered

## **Appendix B – Faculty Vitae**

Please use the following format for the faculty vitae (2 pages maximum in Times New Roman 12 point type)

1. Name
2. Education – degree, discipline, institution, year
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time
5. Certifications or professional registrations
6. Current membership in professional organizations
7. Honors and awards
8. Service activities (within and outside of the institution)
9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation
10. Briefly list the most recent professional development activities

## **Appendix C – Equipment**

Please list the major pieces of equipment used by the program in support of instruction.

1. Classroom/Laboratory: 28 networked nodes in Academic Building 1 room 211.
2. Classroom/Laboratory: 20 networked nodes in Academic Building 1 room 209.
3. VMWare Compliant Virtual Farm servicing classroom/laboratories, faculty offices, and student work areas.
4. Presentation facilities in 5 teaching areas.
5. Robotics laboratory with set of 20 robotics kits.
6. Forensic Media system
7. Network Laboratory
8. Mobile Laboratories: two 20 node mobile networks (1 PC, 1 Mac) with powered cart.
9. 3D Printer
10. Each faculty member has a laptop for presentation purposes

## Appendix D – Institutional Summary

Programs are requested to provide the following information.

### 1. The Institution

- a. Name and address of the institution

Sam Houston State University  
1800 Avenue I  
Huntsville TX 77341

- b. Name and title of the chief executive officer of the institution

Dr. Dana Gibson, University President

- c. Name and title of the person submitting the self-study report.

Dr. Peter Cooper  
Department Chair, Computer Science

- d. Name the organizations by which the institution is now accredited, and the dates of the initial and most recent accreditation evaluations.

Southern Accreditation for Colleges and Schools

### 2. Type of Control

Description of the type of managerial control of the institution, e.g., private-non-profit, private-other, denominational, state, federal, public-other, etc

SHSU is a State Institution under control of the Texas Higher Education Coordinating Board

### 3. Educational Unit

Describe the educational unit in which the program is located including the administrative chain of responsibility from the individual responsible for the program to the chief executive officer of the institution. Include names and titles. An organization chart may be included.

The Program is located in the College of Sciences under Dean John Pascarella.

The College is under the administrative control of the Provost and chief academic officer, Dr. Jaimie Hebert, who reports directly to President Dana Gibson.

### 4. Academic Support Units

List the names and titles of the individuals responsible for each of the units that teach courses required by the program being evaluated, e.g., mathematics, physics, etc.

Mathematics: Department Chair Brian Loft:

Physics: Department Chair Barry Friedman

Chemistry: Department Chair Richard Norman  
Biology: Interim Department Chair Chad Hargrave  
Geography/Geology: Department Chair Brian Cooper

**5. Non-academic Support Units**

List the names and titles of the individuals responsible for each of the units that provide non-academic support to the program being evaluated, e.g., library, computing facilities, placement, tutoring, etc.

Library: Director of Library Services Ann Holder  
Information Technology: Vice President for Information Technology. Mr. Mark Adams  
Research and Special Programs: Associate Vice President Dr. Jerry Cook  
Student Advising and Mentoring Service. Dr. Bill Fleming. Executive Director of SAM Center  
Career Service: Pam Laughlin. Director of Career Services

**6. Credit Unit**

It is assumed that one semester or quarter credit normally represents one class hour or three laboratory hours per week. One academic year normally represents at least 28 weeks of classes, exclusive of final examinations. If other standards are used for this program, the differences should be indicated.

**7. Tables**

Complete the following tables for the program undergoing evaluation.



**Table D-1. Computer Science Enrollment and Degree Data**

	Academic Year	Enrollment Year					Total Undergrad	Total Grad	Degrees Awarded			
		1st	2nd	3rd	4th	5th			Associates	Bachelors	Masters	Doctorates
AY' 11	FT	50	49	44	44		187			29*		
	PT	4	4	10	26		44					
AY'10	FT	49	47	34	48		178			29		
	PT	3	6	6	15		30					
AY'09	FT	58	48	32	25		163			22		
	PT	2	5	5	20		32					
AY' 08	FT	49	29	44	29		151			19		
	PT	4	12	3	12		31					
AY' 07	FT	53	27	34	15		129			17		
	PT	8	4	2	17		31					

\*AY'11 graduates do not include summer 2012 graduates.

Give official fall term enrollment figures (head count) for the current and preceding four academic years and undergraduate and graduate degrees conferred during each of those years. The "current" year means the academic year preceding the fall visit.

FT--full time

PT--part time



**Table D-2. Personnel**

Computer Science

Year<sup>1</sup>: \_\_2011/12\_\_

	HEAD COUNT		FTE <sup>2</sup>
	FT	PT	
Administrative <sup>3</sup>		3	1.0
Faculty (tenure-track)	8	3	10.0
Other Faculty (excluding student Assistants)	1		1.0
Student Teaching Assistants		7	7
Student Research Assistants			
Technicians/Specialists	1	2	3
Office/Clerical Employees	1		1.0
Others <sup>4</sup>			

Report data for the program being evaluated.

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

<sup>2</sup> For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students,

1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc. For faculty members, 1 FTE equals what your institution defines as a full-time load.

- <sup>3</sup> Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.
- <sup>4</sup> Specify any other category considered appropriate, or leave blank.

## **Signature Attesting to Compliance**

By signing below, I attest to the following:

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

\_\_\_\_\_  
**Dean's Name (As indicated on the RFE)**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**