COMPUTER SCIENCE ACCREDITATION COMMISSION

of the

COMPUTING SCIENCES ACCREDITATION BOARD

FINAL STATEMENT

to

KANSAS STATE UNIVERSITY

Manhattan, Kansas

Dates of Visit:	October 21-22, 1991
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KANSAS STATE UNIVERSITY

FINAL STATEMENT

1991-92 EVALUATION

This is a confidential statement from the Computer Science Accreditation Commission to Kansas State University. It is intended for internal use by the institution only, and is not for release except as allowed by policies of the Computing Sciences Accreditation Board.

I. INTRODUCTION

The Kansas State University is one of three state universities in Kansas. It is a comprehensive university with an enrollment of 18,870 students. The Department of Computing and Information Sciences resides within the College of Arts and Sciences. It offers four different undergraduate degree programs. Only one of the programs (B.S. in Computer Science) was requested to be considered for accreditation.

The Computer Science Accreditation Commission (CSAC) of the Computing Science Accreditation Board (CSAB) evaluated the B.S. in Computer Science program of Kansas State University during the 1991-92 cycle for possible accreditation under the CSAC/CSAB "Criteria for Accrediting Programs in Computer Science in the United States" (*Criteria*). CSAC considers the following comments to relate directly to its accreditation actions.

II. FINDINGS FROM THE CSAC EVALUATION VISIT

The following are the findings of the CSAC Evaluation Team at the time of the evaluation site visit on October 21-22, 1991. No changes that were documented after the visit are included in this section.

A. Faculty

There are 16 faculty members in the Department of Computing and Information Sciences. Of these 16, two are primarily associated with the Information Systems program and the remaining 14 are associated with the Computer Science program. The B.S. in Computer Science program meets the CSAC/CSAB criterion of having sufficient full time equivalent faculty with primary commitment to the program to provide continuity and stability. The course offerings are such that the students can complete the program in a timely manner.

Twelve of the 16 faculty have a Ph.D. in Computer Science, one has a Ph.D. in Electrical Engineering, one a Ph.D. in Mathematics and one a Ph.D. in Chemistry. All of the faculty are contributing to the discipline and all are able to teach a broad range of courses. The faculty meet the criteria of the CSAC/CSAB for interests and qualifications.

The teaching loads are relatively light with most faculty teaching three courses per year and a few teaching four courses per year. There is adequate time for research, scholarship and professional development.

Lower division courses were large, but there were sufficient GTAs assigned so that adequate interaction with the students was available. Upper division courses would normally not exceed 30 students, but some sections were larger than 30 students. In these cases there were GTAs assigned to the classes. The CSAC/CSAB criteria for class sizes were met.

The advising of students is centralized in the department with adequate release time to those faculty who advise. However, the advising process was not working well, because students did not observe prerequisites and were not always advised to take the appropriate science courses. Thus the quality of advising is a concern.

The faculty did not provide careful oversight of those courses which were taught by graduate teaching assistants. It is a concern that there was a lack of oversight by the faculty to ensure that the choice of texts will ensure that the proper material will be taught in course and that the course content was consistent with the catalog description. Because of these inconsistencies there was a large overlap in course material, particularly CIS 200, CIS 300 and CIS 500. This is a concern.

B. Curriculum

Computer Science

The curriculum for the B.S. in Computer Science program was evaluated as shown below.

Area	Hours
General Education Requirements	32
Basic Science	14
Mathematics	17
Computer Science -- Core	22
Computer Science -- Advance	21
Other	10
Total	122

Thus the program satisfies the CSAC/CSAB quantitative requirements for course work in the curriculum.

Computer Science -- Core

The computer science core differs between the self study evaluation and the allocation as made by the CSAC/CSAB evaluation team. The team felt that some of the courses evaluated as advanced in the self study were actually a lower level core courses. Nevertheless, the evaluation team found that the core

courses provided roughly uniform coverage across the six required areas of computer science. The core consists of 22 hours and includes appropriate design experiences.

Computer Science -- Advanced

The institutional self study showed 33 credit hours in the advanced category of the curriculum. The team evaluated the curriculum to have only 21 hours of advanced course work. The CSAC/CSAB team placed CIS 580, Numerical Methods into the category of mathematics. It determined that CIS 500, Analysis of Algorithms and Data Structures; CIS 505, Introduction to Programming Languages; and CIS 570, Theory of Computer Science, as being moved from the self study area of advanced and placed in the core. This left the advanced category with the following courses totalling 21 hours.

1) CIS 520 Operating Systems I
2) CIS 560 Introduction to Data Management Systems
3) CIS 540 and 541 Software Engineering Project I & II
4) 3 Computer Science Technical Electives

If the technical electives are selected from advanced computer science courses, the CSAC/CSAB requirement relating to depth of knowledge in at least one-half of the core material can be met. However, most of the transcripts of recent graduates showed that electives in COBOL and advanced COBOL were being used to satisfy advanced computer science electives and so the CSAC/CSAB criterion for appropriate depth of coverage is not satisfied.

Additional Requirements

Two courses in calculus, one in discrete mathematics, one in matrix theory, and one in probability and statistics make the 17-credit mathematics requirements as shown in the self study. The team added PHIL 220, Symbolic Logic, which it moved from the core and CIS 580, Numerical Methods, which it moved from the advanced, to the above 17 hours for a total of 23 hours in mathematics. Under either allocation, the CSAC/CSAB criterion is satisfied.

Four courses in natural science are required to meet graduation requirements. Two of the courses must form a sequence. However, the team found that most of the transcripts of recent graduates revealed that the students were not taking the science courses designed for science or engineering majors. Moreover, some students did not take four science courses. Thus, the CSAC/CSAB criteria to take science courses which are designed for science or engineering majors is not satisfied nor is the CSAC/CSAB requirement to take two additional courses beyond the introductory two-semester science sequence satisfied.

The university has a well-defined general education requirement. It includes two courses in English composition, a course in speech, four courses in humanities (one each from fine arts, philosophy, western heritage, and literary arts) and four courses in social sciences. In addition, a technical writing course is required. This totals to a minimum of 32 hours in general education plus three hours of technical writing.

The general education requirements satisfy the CSAC/CSAB requirement for one year of general education, and the requirement for the development of communication skills within the computer science program is met.

The department has instituted a course together with the philosophy department on the social and ethical implications of computing. This is a required course for B.S. in C.S. majors. Thus the CSAC/CSAB criterion in this area is satisfied.

C. Laboratory and Computing Resources

Student access to the department computer terminals and computers appears to be adequate. The major use by undergraduates is on PCs running MS/DOS and connected to the University's Ethernet network. There are 25 such machines. In addition there are four MacIntosh computers used for graphics. There are four 3B2s and two 3B15s which are used with the Unix O.S. for undergraduates. There are eight terminals that connect to these machines. There is a Harris HCX-9 running Unix and a Salboune 5/602 multiprocessor also running Unix used mostly by graduates and faculty research.

The University provides five public laboratories running PCs and available 24 hours per day. There are 60 PCs in these laboratories, and they are interconnected to the Ethernet.

There is adequate documentation available from GTAs that support the laboratories, and much of the documentation is also available on-line. Students interviewed felt that the computer availability and help by GTAs was adequate.

The faculty have a SUN workstation in their office and have access over the network to the research machines available in the department and the university.

The CSAC/CSAB criteria for laboratory and computer resources are satisfied. The institutional support to purchase new equipment and to maintain the current hardware and software is a concern (see Institutional Support).

D. Students

The quality of the students is difficult to determine from examining the transcripts in the curriculum in B.S. in Computer Science. Until this past spring semester, no student had graduated who satisfied the current program. Many students did not take the appropriate number and type of natural science courses, and many did not take advanced computer science electives to satisfy the depth requirement in one-half of the core areas. This may be due to inadequate advising of the students.

The advising function is centralized, and two persons are given adequate release time and support to perform this function. With correct advising the CSAC/CSAB criteria for students will be satisfied.

E. Institutional Support

Faculty Support

Each faculty member had a spacious office with a computer available. Teaching loads are reasonable and research and scholarly activities were supported by the administration. Salaries were competitive and a sabbatical policy was in place. The amount of institutional funds available for faculty to attend national technical meetings was insufficient and many faculty had to cost share travel expenses. The small amount of support to allow faculty members to attend national technical meetings is a concern.

Library

The library was adequately staffed with professional librarians and support personnel. There was sufficient financial support to acquire and maintain an adequate technical collection and appropriate non-technical collection. The CSAC/CSAB criteria as applied to the library were met.

Office Secretarial Support

The secretarial support for the department was excellent but overworked. The department secretary was consistently working overtime. The adequacy of office support staff is a concern.

Laboratory Equipment

Although there is adequate laboratory equipment for the students and faculty, there is insufficient institutional support to acquire replacement equipment and to support maintenance of both equipment and software. Most of the equipment that was obtained by the department was received from grants and gifts. Last year the department was unsuccessful in obtaining such grants. Without regular institutional funds, the equipment will deteriorate. The CSAC/CSAB criteria for institutional support of equipment is a concern.

Administrative Support

There is a positive and constructive leadership at all levels of the administration from the Provost, Dean of the College of Arts and Sciences, and the Head of the department. They are very supportive and enthusiastic about the Department of Computing and Information Sciences. They realize the limits of financial restrictions imposed by the state budget and are trying to overcome these problems. Some creative concepts on their part with regard to a fee for use of computer laboratories may help with the support problem. The CSAC/CSAB criteria for administrative support are satisfied.

F. Conclusions

The following are deficiencies relative to the CSAC/CSAB criteria:

(1) The three Computer Science electives needed to provide depth in at least one-half of the core areas are not being met by all of the students, and thus the CSAC/CSAB requirement for appropriate depth of coverage is not satisfied.

(2) The CSAC/CSAB criteria regarding use of science courses which are designed for science or engineering majors are not satisfied nor is the CSAC/CSAB requirement to take two additional courses beyond the introductory two-semester science sequence satisfied.

In addition, the following concerns may affect the stability, overall quality and accreditability of the program:

(1) The small amount of budgeted institutional funds to support the purchase and maintenance of computer equipment and software.

(2) The small amount of budgeted institutional funds to support faculty travel and development.

(3) The lack of oversight by course coordinators when the course is taught by graduate teaching assistants.

(4) A lack of oversight on the choice of computer science texts to ensure that the proper material will be taught in a course.

(5) The need to assure that the course content in certain computer science courses will be consistent with the catalog description.

(6) The large overlap of material taught in CIS 200, CIS 300, CIS 500.

(7) The need for additional office support staff.

(8) An inadequate advising system that does not ensure that the prerequisite structure is followed and the choice of science courses is appropriate.

III. ACTIONS SINCE THE EVALUATION VISIT

Kansas State University has taken a number of actions since the time of the visit to address the deficiencies and concerns expressed in the Preliminary Statement for Review and Comment. These include:

1. The COBOL and Advanced COBOL courses have been deleted from the list of approved electives. Electives must now be selected from the set of 500 level (or higher) courses and a grade of at least C must be attained in all prerequisite courses. These actions have been approved by the College of Arts and Sciences. This effectively addresses the deficiency associated with depth of coverage at the advanced level.

2. Students must now select four science courses from a list of courses for science and engineering majors. They must take a two course sequence with laboratory in biology, geology, physics, or chemistry. This action has also been approved by the College of Arts and Sciences. This effectively addresses the deficiency related to the science component.

3. The concern related to the small amount of budgeted institutional support for the purchase and maintenance of computer equipment and software was addressed with a letter from the Provost committing the University to continue support for these budget items.

4. The concern related to a lack of oversight by course coordinators when a course is taught by graduate teaching assistants has been remedied. The department has voted that all undergraduate courses will be taught by faculty and graduate teaching assistants will only assist in laboratories.

5. The lack of oversight on the choice of computer science texts to ensure that the proper material will be taught in a course has been corrected by requiring that the selected text be approved by the Undergraduate Studies Committee of the department prior to ordering the text.

6. The need to assure that the course content in certain computer science courses will be consistent with the catalog description has been satisfied by requiring each instructor to submit a detailed course outline for review and approval by the Undergraduate Studies Committee of the department prior to offering of the course.

7. The concern related to the large overlap of material taught in CIS 200, 300, and 500 has been remedied by revising the course descriptions and outlines of these three courses. The new course outlines were included in the due process response.

8. The need for additional office support staff was satisfied by providing an additional half-time clerk/secretary.

9. An inadequate advising system that does not ensure that the prerequisite structure is followed and the choice of science courses is appropriate was a concern. This has been remedied by requiring a grade of C or better for each prerequisite course in the major, the listing of allowable science courses, and the institution of a system of verification so that all students who pre-enroll in a course have now met prerequisites.

IV. SUMMARY

The program leading to the B.S. in Computer Science at Kansas State University has good students and a dedicated faculty. The quality of instruction appears to be good and students believe they are receiving a good education. The department has been very responsive to the deficiencies and concerns expressed in the Preliminary Statement for Review and Comment. As a result, the program now satisfies CSAC/CSAB criteria. Nevertheless, there are some areas of concern that may affect the stability, overall quality, or future accreditability of the program. These include:

1. The continued effectiveness of the program after the revisions in course content for CIS 200, 300, and 500.

2. The effectiveness of the advising system in the selection of proper science courses and in the monitoring to ensure the proper prerequisite courses are taken for computer science advanced courses and electives.

3. The availability of institutional funds to support faculty travel and development.

4. The availability of budgeted institutional funds to support the purchase and maintenance of computer equipment and software.

While these concerns do not represent deficiencies relative to the *Criteria* at this time, they will be of particular interest to the next CSAC evaluation team.