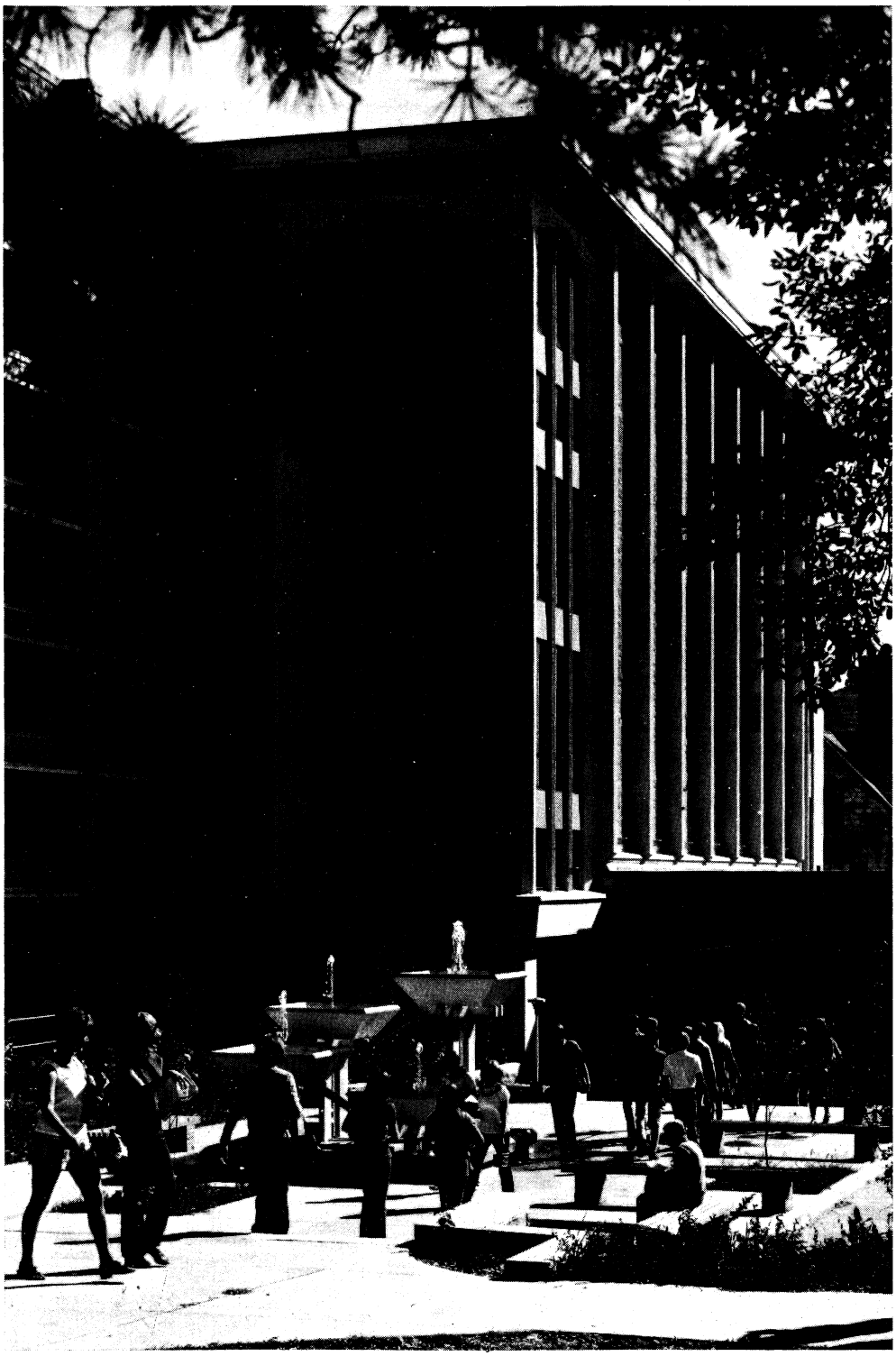
The Ph.D. Program in Computer Science at the University of Kansas and Kansas State University

The Ph.D. Program in Computer Science at the University of Kansas and Kansas State University



I. INTRODUCTION

Computer science has rapidly become an integral part of the higher educational pattern, equipping aspiring scientists, scholars, engineers, administrators, and teachers with the computer science understanding essential to their future careers. In response to the broad need for advanced training in computer science the University of Kansas and Kansas State University jointly offer the Ph.D. in this field. The doctor of philosophy degree in computer science is granted by each institution. The resources of both institutions are available to each doctoral candidate and his degree is granted by the institution with which his dissertation director is affiliated.

Application for admission to the Ph.D. program may be made to the Department of Computer Science at either the University of Kansas or Kansas State University. Once admitted to the program, a student in good standing need make no further application to enroll in classes on either campus.

Assistantships and fellowships are ordinarily available on each campus and are awarded according to the established procedures of each school and department.

Requirements

II. REQUIREMENTS FOR THE PH.D. DEGREE IN COMPUTER SCIENCE

Each doctoral candidate will be required to take a candidacy examination, write a dissertation, and defend the dissertation in a final oral examination.

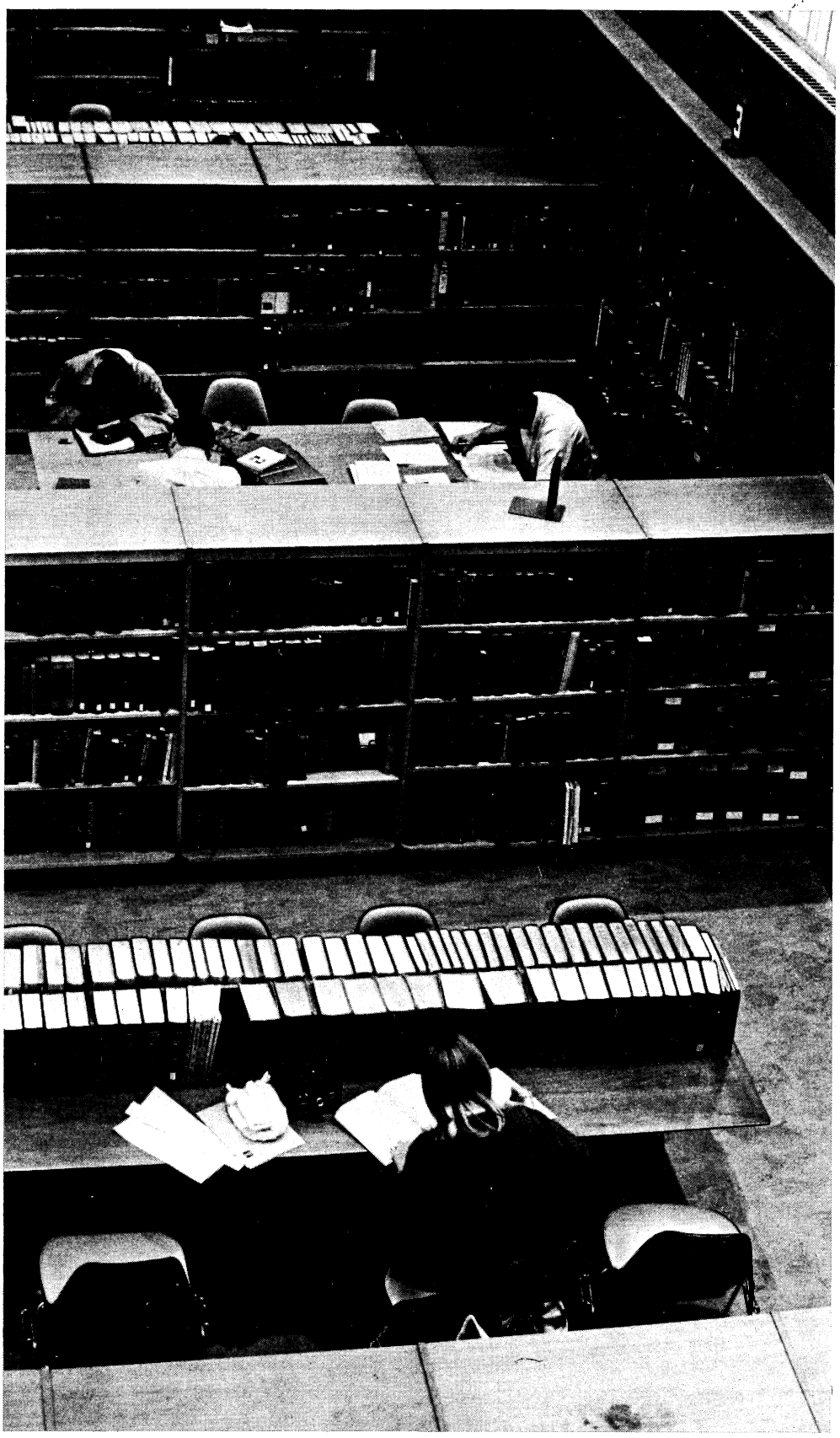
For initial admission to the Ph.D. program, the candidate files a "Declaration of Intent" (see last page of brochure) with the graduate studies committee in the appropriate department. Candidates who are simultaneously seeking admission to the institution and the Ph.D. program would normally include the "Declaration of Intent" with other admissions materials.

The candidacy examination will consist of both a written and an oral examination. It will be individually tailored to the student, and will be prepared and administered by the student's committee, formed when the student is admitted to the Ph.D. program. The student must have completed the major portion of his course work before the candidacy examination will be scheduled.

Passing the candidacy examination explicitly defines admission to candidacy. At that time, a dissertation committee is appointed. Normally, the dissertation committee is a three-member subcommittee of the student's committee with the student's research adviser as chairman. If the student wishes, faculty from both campuses may be on the dissertation committee, but this is not required.

When the completed dissertation has been submitted to the committee, a final oral examination will be scheduled. This examination will be announced to the Computer Science Department and other relevant departments on both campuses so that, in addition to the final examination committee, other interested faculty and students may attend.

The doctoral candidate will also be responsible for meeting any other general requirements (e.g., foreign language or skills requirement) at his institution.



Courses of Instruction

III. COURSES OF INSTRUCTION

The following courses are listed as they appear in the catalogs of the two institutions. Conventions of course numbering, prerequisites, and other special information contained in the lists are consistent with the individual institution's practice.

AT THE UNIVERSITY OF KANSAS

Faculty: Bavel, Boggs, Bulgren, Case, Hetherington, Horowitz, Mansfield, Schweppe, S. Sedelow, W. Sedelow, Tuggle.

FOR UNDERGRADUATE CREDIT ONLY

16. Introduction to Computing. (2) Algorithms, programs, and computers. Expressions, statements, and program structure. Programming and computing systems. Debugging and verification of programs. Data representation. Organization and characteristics of computers. Survey of computers, languages, computing systems and applications. Computer solution of several problems using various languages. Prerequisite: Mathematics 2a, or 2c, or 10, or 11, or equivalent.

FOR JUNIORS, SENIORS AND GRADUATE STUDENTS

Note: Courses C.S. 100, C.S. 110, and C.S. 120 may not be taken for graduate credit by computer science majors.

100. Computers and Programming. (3) Computer structure, machine language, instruction execution, addressing techniques, and digital representation of data. Computer systems organization, logic design, micro-programming and interpreters. Symbolic coding and assembly systems, macro definition and generation, and program segmentation and linkage. Systems and utility programs, programming techniques, and recent developments in computing. Several computer projects to illustrate basic machine structure and programming techniques. Prerequisite: Course 16, or equivalent.

110. Logic, Algorithms, and Graph Theory. (3) Review of sets, relations and mappings. Boolean algebra and propositional logic. Algorithms and abstract machines. Elements of graph and network theory. Applications to the computer and information sciences. Prerequisites: Course 16 and Mathematics 11 or 22, or equivalent.

120. Fundamentals of Symbol Processing. (3) An introduction to computer-based symbol manipulation, including data representation, algorithm development, programming languages, computer organization, and input-output options. Computer analysis of languages, of other communication modes such as music and art, of human artifacts, and of behavioral phenomena. Solution of several basic information processing problems using the computer.

132. Pattern Recognition and Pattern Generation. (3) Computer-based techniques for inputting, manipulating and analyzing, and outputting the aural, visual and tactile data of the fine arts, humanities, and social sciences. Computer-generation of art, music, and literary forms. Analysis of artifacts. Encoding, software, hardware, graphics. Prerequisite: Course 16 or 120.

150. Data Structures. (3) Basic concepts of data. Linear lists, strings, arrays, and orthogonal lists. Representation of trees and graphs. Storage systems and structures, and storage allocation and collection. Multilinked structures. Symbol tables and searching techniques. Sorting (ordering) techniques. Formal specification of data structures, data structures in programming languages, and generalized data management systems. Prerequisites: Courses 100 and 110, or equivalent.

160. Programming Languages. (3) Formal definition of programming languages including specification of syntax and semantics. Simple statements including precedence, infix, prefix, and postfix notation. Global properities of algorithmic languages including scope of declaration, storage allocation, grouping of statements, binding time of constituents, subroutines, coroutines, and tasks. Run-time representation of program and data structures. Prerequisites: Courses 100 and 110, or equivalent.

170. Computer Organization. (3) Basic digital circuits, Boolean algebra and combinational logic, data representation and transfer, and digital arithmetic. Digital storage and accessing, control functions, input-output facilities, system organization, and reliability. Description and simulation techniques. Features needed for multi-programming, multi-processing, and real-time systems. Other advanced topics and alternate organizations. Prerequisites: Courses 100 and 110, or equivalent.

180. Numerical Calculus. (3) An introduction to the numerical algorithms fundamental to scientific computer work. Includes elementary discussion of error, polynomial interpolation, quadrature, linear systems of equations, solution of nonlinear equations, and numerical solution of ordinary differential equations. The algorithmic approach and the efficient use of the computer are emphasized. Prerequisites: Course 16 and Mathematics 55, or equivalent.

181-182. Numerical Analysis I and II. (3,3) (Same as Mathematics 181-182)

190. Special Topics. (1-3) Arranged as needed to present appropriate material to groups of students. May be repeated for additional credit. Prerequisite: Variable.

192. History of Computing Technology and Information Science. (3) Important ideas, inventions, and leaders from the seventeenth century to the present. Particular attention to the sources of innovations, the uses made of computer science knowledge, and the development of a separate academic discipline. Prerequisite: Course 16 or 120.

194. Social Issues in Computer Science. (3) A critical examination of attempts to assess the societal consequences of current, prospective, and proposed uses of computers. The present status of computer science as a profession. Contemporary situation of computer science professionals vis-a-vis industry, government, education, the professions, and the general public. Comparative analysis of computer science in other countries. Prerequisite: Course 16 or 120.

199. Directed Reading. (1-3) Reading under the supervision of an instructor on a topic chosen by the student with the advice of an instructor. May be repeated for additional credit. Consent of the department required for enrollment. Prerequisite: Instructor's permission.

The Ph.D. Program in Computer Science at Kansas State University and the University of Kansas