ANNUAL REPORT OF THE COMMITTEE ON
GRADUATE STUDIES TO THE FACULTY OF
ARTS AND SCIENCES
October 28, 1985

I. COMMENTS

The tables in Section II give a variety of data regarding admissions,
enrollments, and degrees. There do not appear to be any significant changes
since last year, but of course trends are obscured easily by normal fluc-
tuations.

Section III describes course changes and new courses.

The Computer Science Ph.D. program will begin in September of 1986.
There are at this time several students who have completed their master's
work but are continuing their course work and research to prepare themselves
to make rapid progress toward the Ph.D. Many of the course changes and new
courses in Section III are in preparation for the new Ph.D.

The possibility of a Master's in Liberal Arts program is being
considered by an ad-hoc committee chaired by J. C. Livingston.

The possibility of a Ph.D., in American Studies program is being
considered by an ad-hoc committee chaired by B. A. McConachie.

Contributions are being made to the area generally called Museum
Studies by various departments and schools. There is interest in
coordinating and extending these efforts, and an ad-hoc committee chaired by
J. E. Selby is beginning to study the matter.

Evaluations of our graduate programs are scheduled so that each program
is evaluated about every six years. The evaluation of the English program
was completed in February 1985. The evaluation of the Mathematics program
was completed in April 1985. The evaluation of the Biology program is
taking place now; the external consultant visited October 8-9. Reports on
all completed evaluations are available in the Swem Library archives and in
the graduate office.

Slow but real improvements in graduate student support have taken
place; the "standard stipend" for assistants is now $4,600 for the academic
year. Nevertheless, it remains true that the relatively low level of
support per student, and the small number of students for whom support is
available, are continuing to limit our programs.

II. DATA ON STUDENTS AND DEGREES

A. ADMISSIONS - Fall Semester 1985

DEPARTMENT	*NUMBER APPLICANTS	NUMBER ACCEPTED	NUMBER MATRICULATED
AMERICAN STUDIES	28	13	12
ANTHROPOLOGY	22	13	8
APPLIED SCIENCE	3	1	0
BIOLOGY	41	12	11
CHEMISTRY	14	9	8
COMPUTER SCIENCE	68	38	18
ENGLISH	28	19	10
GOVERNMENT	12	6	3
HISTORY	85	22	21
MATHEMATICS	13	10	2
PHYSICS	54	20	8
PSYCHOLOGY	45	10	9
SOCIOLOGY	10	6	3
TOTALS	423	179	113
PSY.D. PROGRAM**	228	17	11

*Number of graduate applications received in the graduate office and application fees paid or waived, for September admission only.

**Total in Consortium.

B. AVERAGE UNDERGRADUATE GRADE POINT AVERAGE OF ENTERING STUDENTS (4.0 SCALE

DEPARTMENT	FALL 1983	FALL 1984	FALL 1985
AMERICAN STUDIES	3.37 (9 of 10)	3.40 (13 of 14)	3.31 (8 of 12)
ANTHROPOLOGY	3.24	3.32 (10 of 11)	3.16
APPLIED SCIENCE	2.89		
BIOLOGY	3.19 (8 of 9)	3.05	3.10
CHEMISTRY	2.50	3.05	2.75
COMPUTER SCIENCE		3.10	2.90
ENGLISH	3.34	3.24	3.35
GOVERNMENT	3.20 (4 of 7)	3.34 (7 of 10)	3.74 (2 of 3)
HISTORY	3.50 (19 of 20)	3.45	3.44 (20 of 21)
MATHEMATICS	3.32 (2 of 5)	2.87 (1 of 2)	3.16
PHYSICS	3.13 (9 of 11)	3.18 (10 of 12)	3.25 (5 of 8)
PSYCHOLOGY	3.17 (8 of 9)	3.31	3.41
PSY.D. PROGRAM	3.75	3.58	3.23
SOCIOLOGY	3.20 (2 of 3)	3.01	2.77

C. AVERAGE GRADUATE RECORD EXAMINATION SCORES OF ENTERING STUDENTS

DEPARTMENT	FALL 1984			FALL 1985		
	VERB	MATH	ADV	VERB	MATH	ADV
AMERICAN STUDIES	634 (10 of 14)	566 (10 of 14)	535 (2 of 14)	683 (8 of 12)	541 (8 of 12)	500 (1 of 12)
ANTHROPOLOGY	562 (7 of 11)	546 (7 of 11)	550 (1 of 11)	590 (7 of 8)	501 (7 of 8)	---
APPLIED SCIENCE	---	---	---	---	---	---
BIOLOGY	538	602	650 (58%) (6 of 7)	560 (10 of 11)	589 (10 of 11)	662 (63%) (10 of 11)
CHEMISTRY	---	---	---	490 (1 of 8)	580 (1 of 8)	490 (9%) (1 of 8)
COMPUTER SCIENCE	563	653	510 (19%) (1 of 17)	567 (14 of 18)	644 (14 of 18)	630 (60%) (4 of 18)
ENGLISH	628 (11 of 12)	516 (11 of 12)	552 (58%) (9 of 12)	647	539	556 (60%) (9 of 10)
GOVERNMENT	589 (9 of 10)	536 (9 of 10)	520 (72%) (2 of 10)	510 (1 of 3)	580 (1 of 3)	500 (64%) (1 of 3)
HISTORY	629	538	516 (55%) (19 of 21)	620	571	518 (56%) (18 of 21)
MATHEMATICS	425	750	660 (43%) (1 of 2)	470	615	570 (23%) (1 of 2)
PHYSICS	598 (8 of 12)	727 (8 of 12)	579 (34%) (6 of 12)	605 (6 of 8)	680 (6 of 8)	568 (31%) (6 of 8)
PSYCHOLOGY	558	548	583 (67%)	594	563	607 (74%) (6 of 9)
PSY.D. PROGRAM	616	579	637 (84%)	646	594	658 (89%)
SOCIOLOGY	508 (4 of 6)	455 (4 of 6)	430 (50%) (1 of 6)	515 (2 of 3)	535 (2 of 3)	---

D. <u>REGISTERED REGULAR & PROVISIONAL GRADUATE STUDENTS*</u>
<u>Fall 1983 to Fall 1985</u>

DEPARTMENT	FALL 1983	SPRING 1984	FALL 1984	SPRING 1985	FALL 1985
AMERICAN STUDIES	11	10	18	22	16
ANTHROPOLOGY	11	10	15	15	13
APPLIED SCIENCE	44	36	1	3	1
BIOLOGY	25	24	21	20	20
CHEMISTRY	8	8	5	3	9
COMPUTER SCIENCE			48	47	56
ENGLISH	16	13	16	16	21
GOVERNMENT	9	9	15	12	5
HISTORY	38	39	41	38	46
MATHEMATICS	11	17	13	11	11
PHYSICS	40	37	42	43	38
PSYCHOLOGY	14	14	15	15	16
SOCIOLOGY	8	7	8	8	7
A & S TOTALS	235	224	258	253	259
PSY.D. PROGRAM**	46	40	36	50	57

*Totals include both full-time and part-time registration.

**Total in Consortium.

NOTE: The Computer Science department now enrolls most of the students listed previously under Applied Science. The Applied Science program now enrolls interdisciplinary students in the sciences.

E. GRADUATE DEGREES CONFERRED 1984-85

DEPARTMENT	DEGREE	AUGUST 1984	DECEMBER 1984	MAY 1985	TOTAL
AMERICAN STUDIES	M.A.	0	2	2	4
ANTHROPOLOGY	M.A.	0	0	1	1
APPLIED SCIENCE	M.S.	1	0	0	1
BIOLOGY	M.A.	1	3	4	8
CHEMISTRY	M.A.	6	1	2	9
	M.S.	0	0	0	0
COMPUTER SCIENCE	M.S.	1	0	8	9
ENGLISH	M.A.	1	7	1	9
GOVERNMENT	M.A.	0	1	0	1
HISTORY	M.A.	1	5	5	11
	Ph.D.	0	2	0	2
MATHEMATICS	M.A.	0	0	0	0
	M.S.	0	0	6	6
PHYSICS	M.A.	0	0	0	0
	M.S.	6	1	4	11
	Ph.D.	0	3	2	5
PSYCHOLOGY	M.A.	2	1	6	9
	Psy.D.**	1	2	2	5
SOCIOLOGY	M.A.	1	2	2	5
	M.A.	12	22	23	57
	M.S.	8	1	18	27
	Ph.D.	0	5	2	7
	Psy.D.**	1	2	2	5

*M.A. IN EDUCATION (Secondary School Teaching)

Biology	2	Mathematics	2
Classical Studies	0	Museum Education	3
English	1	Secondary School Teaching	2
History	3	Social Studies	0
		Physical Education	0

TOTAL NUMBER OF DOCTORATES CONFERRED
AUGUST 1984 THROUGH MAY 1985

Arts and Sciences	–	7 Ph.D., 5 Psy.D.**
Education	–	20 Ed.D.
Marine Science	–	9 Ph.D.

*Degree candidates for the M.A. in Education (Secondary School Teaching) take 12 hours of course work in Arts and Sciences.
**Total in the Consortium.

(August – June)

DEPARTMENT	PROGRAM INITIATED	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85	AUG. 1985	TOTAL SINCE AUG. 1975
AMERICAN STUDIES	1982-M.A.								0	1	4	0	5
ANTHROPOLOGY	1978-M.A.				0	0	2	2	3	5	1	1	14
APPLIED SCIENCE	1970-M.S.	4	15	13	6	7	14	9	9	10	1	2	90
BIOLOGY	1963-M.A.	6	11	9	7	10	9	11	6	5	8	4	86
CHEMISTRY	1964-M.A./M.S.	2	3	3	0	2	2	6	1	2	9	1	31
COMPUTER SCIENCE	1984-M.S.										9	2	11
ENGLISH	1970-M.A.**	6	7	7	14	2	13	9	6	7	9	2	82
GOVERNMENT	1966-M.A.	9	5	4	5	3	4	5	6	1	1	3	46
HISTORY	1955-M.A.	2	9	6	11	8	5	6	10	7	11	1	76
	1967-Ph.D.	1	3	3	1	3	1	3	2	3	2	0	22
MATHEMATICS	1961-M.A./M.S.	4	2	2	4	3	5	3	5	6	6	0	40
PHYSICS	1959-M.A./M.S.	3	9	5	12	3	9	6	5	10	11	0	73
	1964-Ph.D.	8	2	4	6	2	2	5	7	6	5	3	50
PSYCHOLOGY	1953-M.A.	4	4	5	1	3	5	5	7	2	9	1	46
	1978-Psy.D.***								5	9	5	2	21
SOCIOLOGY	1967-M.A.	4	6	4	4	4	4	4	6	2	5	0	43
A & S TOTALS													
M.A./M.S.		44	71	58	64	45	72	66	64	58	84	17	643
Ph.D.		9	5	7	7	5	3	8	9	9	7	3	72
Psy.D.***									5	9	5	2	21

*See Table E for M.A. in Education degrees.
**Earlier program suspended in 1963.
***Total in the Consortium.

III. CURRICULUM CHANGES
Approved 1984-85

AMERICAN STUDIES

CHANGES: 583, 584. Changed course titles and descriptions.

583. The Material Culture of Early America: Artifacts as Design and as Commodities. Fall (3) Ms. Carson.

As groundwork for the interpretation of objects in museum exhibits, historic house museums, and a variety of scholarly studies, this course introduces techniques for visual analysis of artifacts and ideas about relationships between design, technology, production, and marketing of consumer goods. Students explore various theoretical approaches to the analysis of material culture, develop critical bibliographic skills, and learn to phrase questions (artistic, technological, economic, functional, social, and cultural) about objects. They explore a wide range of sources that may illuminate the questions, and they develop designs for research projects that may answer them.

584. The Material Culture of Early America: Artifacts as Personal or Community Property. Spring (3) Ms. Carson.

This continuation of a two semester sequence builds on previous course work which introduced objects as art and as commodities. Here the focus is on objects as personal or community property. What is the practical, social, and symbolic significance of an artifact or an assemblage of artifacts in the life of an indi-vidual or in the experience of a social group? In a seminar format students devise and discuss their own projects that explore aspects of material culture.

COMPUTER SCIENCE

There will be no foreign language requirement for the Ph.D. program in Computer Science.

NEW COURSES: 513. Symbolic Logic and Theorem Proving. Fall or Spring (3) Staff.

A survey of symbolic logic and its applications to computer science. Topics include predicate calculus, first order calculus, completeness and consistency of logical systems, normalizations, and Robinson's Resolution Theorem. Applications in mechanical theorem proving; an introduction to PROLOG and logic programming.

514. Computer Architecture. Fall and Spring (3) Staff.

An introduction to the principles of computer design. Data
representation, including adders, signed integer arithmetic,
floating point representation, character representation.
Microprocessor, minicomputer, and mainframe architecture,
including processors, clocks, memory, memory management,
bus communication, and input/output.

584. Parallel and Pipeline Processing. Fall or Spring (3)
      Staff.

The study of computers with single or multiple instruction
streams and single or multiple data streams. Analysis of
vector machines and vector algorithms; vectorization of
sequential algorithms. Pipeline strategies. Multiple
processor interconnection topologies. Synchronization and
communication problems of multiple processors.

593. Theory of Computation. Fall or Spring (3) Staff.

An indepth study of Turing machines and the equivalent
computational models, such as recursive function theory and
lambda calculus. Church's thesis and incompleteness results.
Computational complexity.

594. Theory of Operating Systems. Fall or Spring (3) Staff.

Analytic modeling of operating systems: queueing theory and
Markov processes. The mechanisms and policies of process
management, memory management, input/output management, syn-
chronization, and protection. Distributed systems. Analysis
and evaluation of operating systems.

621. Knowledge-Based Databases. Fall or Spring (3) Staff.

The use of knowledge representations in data systems; knowledge
definitions and realizations, acquisition, updating, implemen-
tation strategies. Applications of knowledge-based databases;
query interpretations and approximations, explanations of
derivations, strategies using meta-knowledge.

631. Expert Systems. Fall or Spring (3) Staff.

An introduction to the expert system; transfer of expertise of
basic knowledge and processes, the testing problem, learning,
domain-specific knowledge management, heuristic search, global
strategies, differential diagnosis, causality. Implementation
strategies, implementation languages, efficiency considera-
tions. Analysis of existing expert systems.

650. <u>Advanced Topics</u>. Fall or Spring (1, 2, or 3 credits depending upon material) Staff.

A treatment of doctoral-level topics of interest not routinely covered by existing courses. Material may be chosen from various areas of computer science.

651. <u>Topics in Artificial Intelligence</u>. Fall or Spring (1, 2 or 3 credits depending upon material) Staff.

A treatment of doctoral-level topics in artificial intelligence not routinely covered by existing courses.

652. <u>Topics in Programming Languages</u>. Fall or Spring (1, 2 or 3 credits depending upon material) Staff.

A treatment of doctoral-level topics in programming languages not routinely covered by existing courses.

655. <u>Topics in Software Engineering</u>. Fall or Spring (1, 2 or 3 credits depending upon material) Staff.

A treatment of doctoral-level topics in software engineering not routinely covered by existing courses.

660. <u>Doctoral Dissertation</u>. Fall and Spring (Hours and credits to be arranged) Staff.

DELETION: 574. Computer Architecture.

CHANGES: 565. Changed course title from <u>Software Engineering II</u> to <u>Theory of Program Correctness</u>.

601. <u>Artificial Intelligence II</u>. Renumbered from C.S. 561.

602. <u>Advanced Compiler Construction</u>. Renumbered from C.S. 562.

605. <u>Program Testing</u>. Renumbered from C.S. 585.

<u>HISTORY</u>

NEW COURSES: 605, 606. <u>Introduction to the History Museum</u>. Fall and Spring (3) Mr. Smith.

A course designed to introduce the student to the organizational structure of a large history museum; to identify, explain, and relate its various public and support functions; and to lay a foundation for internship in one of the museum's departments. Limited to students enrolled in the historical sites program.

607, 608. <u>Introduction to Historical Archaeology and Material Culture for Historians</u>. Fall and Spring (3,3) Mr. Brown.

This course serves as an introduction for historians to Historical Archaeology and Material Culture. It surveys the development of the field, current theory and methods, as well as significant research on the cultural aspects of the colonization, industrialization, and urbanization of North America. Emphasis is placed on broad issues, practical skills, and on historical archaeology and material culture in a museum setting. Limited to students enrolled in the History Department apprenticeship/internship in Historical Archaeology.

PHYSICS

CHANGE: 611, 612. Changed course description.

611, 612. <u>Advanced Quantum Mechanics</u>. Fall and Spring (3,3) Mr. Krakauer.

Relativistic single particle equations. Lagrangian field theory. Quantum mechanics of electromagenetic and Dirac fields. Radiative transitions. Quantum electrodynamics. Relativistic perturbation theory. Renomalization. Quantum mechanics of gauge theories.

PSYCHOLOGY

CHANGE: 693. <u>Practicum</u>. Changed credits hours from 3 to variable credit, 3 or 6 credits per semester.

Committee on Graduate Studies:

Samuel Baker
Norman Barka
Donald Baxter
Gregory Capelli
William Davis
Morton Eckhause
Michael Faia
Philip Funigiello
Sidney Lawrence
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