ANNUAL REPORT OF THE COMMITTEE ON
GRADUATE STUDIES TO THE FACULTY OF
ARTS AND SCIENCES
October 26, 1984

The tables in Section II give a variety of data regarding our graduate students. Normal fluctuations make it difficult to make convincing observations about trends, particularly if one looks separately at the thirteen programs. There has however been an increase in the number of new students enrolled (Fall 1983:107. Fall 1984:122) and in the total number currently enrolled (Fall 1983:235. Fall 1984:258). (Psy.D. students in the inter-institutional consortium are not included in these numbers; see the tables for details.)

Computer Science appears the first time as a separate entry. The Applied Science program will continue to be available for special inter-disciplinary arrangements.

The shortage of graduate student support funds continues to be a central problem. However, there are improvements. The "standard stipend" has been raised to $4,212. In addition, we can now charge out-of-state students in-state tuition if they are graduate assistants with the usual kinds of appointments, while the institution can arrange the tuition structure so that there is no loss in revenue. It is reasonable to speculate that the increase in enrollment can be traced, at least in part, to these improvements. It is however still true that our relatively low level of graduate student support is limiting our programs.

We have reported previously regarding our proposal for a Ph.D. program entitled Information Management that was organized through the Applied Science program. With the creation of the Computer Science department, the proposed program was renamed Ph.D. in Computer Science. The staff of the State Council of Higher Education has recommended to the Council that the program be approved as proposed, for initiation in the fall of 1986.

Two new proposals for graduate programs have reached the stage of preliminary organized discussion by groups of our faculty. One deals with an interdisciplinary master's of the kind often called a Master in Liberal Studies. The other deals with a Ph.D. in American Studies. We would of course be happy to provide further information to anyone who is interested in these discussions.

The evaluation of our graduate programs is scheduled so that each is evaluated every five or six years. The English and the Mathematics evaluations are nearing completion, and the Biology evaluation is beginning. Reports on all evaluations are available in the Swem Library archives and in the graduate office.

II. DATA ON STUDENTS AND DEGREES

A. ADMISSIONS – Fall Semester 1984

DEPARTMENT	*NUMBER APPLICANTS	NUMBER ACCEPTED	NUMBER MATRICULATED	**NUMBER UNCLASSIFIED
AMERICAN STUDIES	29	19	14	0
ANTHROPOLOGY	21	17	11	0
APPLIED SCIENCE	30	4	0	0
BIOLOGY	23	9	7	1
CHEMISTRY	8	3	2	0
COMPUTER SCIENCE	29	26	17	0
ENGLISH	37	22	12	0
GOVERNMENT	35	15	10	0
HISTORY	91	21	21	0
MATHEMATICS	11	8	2	0
PHYSICS	48	22	12	0
PSYCHOLOGY	48	7	7	0
SOCIOLOGY	10	7	6	0
TOTALS	420	180	121	1
PSY.D. PROGRAM***	147	17	12	0

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

**Includes only unclassified (post-baccalaureate) students whose admission was approved by the department and graduate dean. These numbers are included in Number Matriculated. In some instances, Unclassified admission was used because regular admissions records were incomplete at the beginning of the semesters.

***Total in Consortium.

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

DEPARTMENT	FALL 1982	FALL 1983	FALL 1984
AMERICAN STUDIES	3.05	3.37 (9 of 10)	3.40 (13 of 14)
ANTHROPOLOGY	3.36	3.24	3.32 (10 of 11)
APPLIED SCIENCE	2.87 (21 of 26)	2.89	
BIOLOGY	3.37	3.19 (8 of 9)	3.05
CHEMISTRY	3.10 (8 of 9)	2.50	3.05
COMPUTER SCIENCE			3.10
ENGLISH	3.30 (7 of 9)	3.34	3.24
GOVERNMENT	2.93 (7 of 9)	3.20 (4 of 7)	3.34 (7 of 10)
HISTORY	3.50	3.50 (19 of 20)	3.45
MATHEMATICS	2.93 (4 of 5)	3.32 (2 of 5)	2.87 (1 of 2)
PHYSICS	3.35 (7 of 10)	3.13 (9 of 11)	3.18 (10 of 12)
PSYCHOLOGY	3.38	3.17 (8 of 9)	3.31
PSY.D. PROGRAM	3.50	3.75	3.58
SOCIOLOGY	3.18	3.20 (2 of 3)	3.01

4

C. AVERAGE GRADUATE RECORD EXAMINATION SCORES OF ENTERING STUDENTS

DEPARTMENT	FALL 1983			FALL 1984		
	VERB	MATH	ADV	VERB	MATH	ADV
AMERICAN STUDIES	631 (7 of 10)	536 (7 of 10)	510 (1 of 10)	634 (10 of 14)	566 (10 of 14)	535 (2 of 14)
ANTHROPOLOGY	578 (4 of 9)	638 (4 of 9)	----	562 (7 of 11)	546 (7 of 11)	550 (1 of 11)
APPLIED SCIENCE	494 (8 of 12)	664 (8 of 12)	577 (38%) (3 of 12)	----	----	----
BIOLOGY	612	624	694 (70%) (8 of 9)	538	602	650 (58%) (6 of 7)
CHEMISTRY	510 (1 of 2)	690 (1 of 2)	----	----	----	----
COMPUTER SCIENCE	----	----	----	563	653	510 (19%) (1 of 17)
ENGLISH	632	551	623 (80%) (7 of 9)	628 (11 of 12)	516 (11 of 12)	552 (58%) (9 of 12)
GOVERNMENT	527	510	497 (57%) (3 of 7)	589 (9 of 10)	536 (9 of 10)	520 (72%) (2 of 10)
HISTORY	643	575	525 (57%) (19 of 20)	629	538	516 (55%) (19 of 21)
MATHEMATICS	250 (1 of 5)	600 (1 of 5)	440 (19%) (1 of 5)	425	750	660 (43%) (1 of 2)
PHYSICS	501 (8 of 11)	691 (8 of 11)	659 (53%) (7 of 11)	598 (8 of 12)	727 (8 of 12)	579 (34%) (6 of 12)
PSYCHOLOGY	594	572	617 (79%) (6 of 9)	558	548	583 (67%)
PSY.D. PROGRAM	661	626	631 (83%)	616	579	637 (84%)
SOCIOLOGY	580 (1 of 3)	550 (1 of 3)	----	508 (4 of 6)	455 (4 of 6)	430 (50%) (1 of 6)

D. REGISTERED REGULAR & PROVISIONAL GRADUATE STUDENTS*
Fall 1982 to Fall 1984

DEPARTMENT	FALL 1982	SPRING 1983	FALL 1983	SPRING 1984	FALL 1984
AMERICAN STUDIES	11	10	11	10	18
ANTHROPOLOGY	13	7	11	10	15
APPLIED SCIENCE	48	45	44	36	1
BIOLOGY	19	22	25	24	21
CHEMISTRY	12	9	8	8	5
COMPUTER SCIENCE					48
ENGLISH	15	16	16	13	16
GOVERNMENT	9	9	9	9	15
HISTORY	34	32	38	39	41
MATHEMATICS	10	9	11	17	13
PHYSICS	38	35	40	37	42
PSYCHOLOGY	14	14	14	14	15
SOCIOLOGY	10	11	8	7	8
A & S TOTALS	233	219	235	224	258
PSY.D. PROGRAM**	42	40	46	40	36

*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 1983-84

DEPARTMENT	DEGREE	AUGUST 1983	DECEMBER 1983	MAY 1984	TOTAL
AMERICAN STUDIES	M.A.	0	0	1	1
ANTHROPOLOGY	M.A.	0	0	5	5
APPLIED SCIENCE	M.S.	3	3	4	10
BIOLOGY	M.A.	0	3	2	5
CHEMISTRY	M.A.	0	1	1	2
	M.S.	0	0	0	0
ENGLISH	M.A.	2	1	4	7
GOVERNMENT	M.A.	1	0	0	1
HISTORY	M.A.	1	3	3	7
	Ph.D.	0	0	3	3
MATHEMATICS	M.A.	0	0	0	0
	M.S.	0	1	5	6
PHYSICS	M.A.	0	0	0	0
	M.S.	2	0	8	10
	Ph.D.	2	3	1	6
PSYCHOLOGY	M.A.	1	0	1	2
	Psy.D.**	2	4	3	9
SOCIOLOGY	M.A.	0	0	2	2
	M.A.	5	8	19	32
	M.S.	5	4	17	26
	Ph.D.	2	3	4	9
	Psy.D.**	2	4	3	9

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

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

TOTAL NUMBER OF DOCTORATES CONFERRED
AUGUST 1983 THROUGH MAY 1984

Arts and Sciences	–	9 Ph.D., 9 Psy.D.**
Education	–	16 Ed.D.
Marine Science	–	12 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.

E. GRADUATE DEGREES AWARDED DURING THE LAST 10 YEARS*
(August – June)

DEPARTMENT	PROGRAM INITIATED	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	AUG. 1984	TOTAL SINCE AUG. 1974
AMERICAN STUDIES	1982-M.A.									0	1	0	1
ANTHROPOLOGY	1978-M.A.					0	0	2	2	3	5	0	12
APPLIED SCIENCE	1970-M.S.	12	4	15	13	6	7	14	9	9	10	1	100
BIOLOGY	1963-M.A.	11	6	11	9	7	10	9	11	6	5	1	86
CHEMISTRY	1964-M.A./M.S.	2	2	3	3	0	2	2	6	1	2	6	29
COMPUTER SCIENCE	1984-M.S.											1	1
ENGLISH	1970-M.A.**	8	6	7	7	14	2	13	9	6	7	1	80
GOVERNMENT	1966-M.A.	4	9	5	4	5	3	4	5	6	1	0	46
HISTORY	1955-M.A.	9	2	9	6	11	8	5	6	10	7	1	74
	1967-Ph.D.	5	1	3	3	1	3	1	3	2	3	0	25
MATHEMATICS	1961-M.A./M.S.	2	4	2	2	4	3	5	3	5	6	0	36
PHYSICS	1959-M.A./M.S.	15	3	9	5	12	3	9	6	5	10	6	83
	1964-Ph.D.	7	8	2	4	6	2	2	5	7	6	0	49
PSYCHOLOGY	1953-M.A.	6	4	4	5	1	3	5	5	7	2	2	44
	1978-Psy.D.***									5	9	1	15
SOCIOLOGY	1967-M.A.	11	4	6	4	4	4	4	4	6	2	1	50

A & S TOTALS

		74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	AUG. 1984	TOTAL
M.A./M.S.		80	44	71	58	64	45	72	66	64	58	20	642
Ph.D.		12	9	5	7	7	5	3	8	9	9	0	74
Psy.D.***										5	9	1	15

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

III. CURRICULUM CHANGES
Approved 1983-84

AMERICAN STUDIES

NEW COURSES: 583.   Introduction to American Decorative Arts, 1650-1850.
               Fall (3). Carson.

Techniques of identification, authentication and evaluation
of artifacts grouped under the heading decorative arts (furni-
ture, ceramics, glass, silver, base metals, and textiles) are
introduced as basic groundwork for the interpretation of these
objects in museum exhibits, historic house museums, and
variety of scholarly studies. Exploration of different
theoretical approaches to the analysis of material culture
and development of critical bibliographic skills will prepare
students to pursue independent research projects.

584.   Research Projects in American Decorative Arts, 1650-1850.
       Spring (3). Carson.

Building on skills learned in the previous semester, students,
with the help of the instructor, will devise their own projects
in the interpretation of material culture. At the same time
they will continue to learn more about objects and their use
in scholarly studies.

CHANGE: 580.   Change credit hours from 3 to variable credits (1-3).

APPLIED SCIENCE

NEW COURSE: 537. Analysis of Algorithms. Spring (3). Stockmeyer.

The study of algorithm design methods, such as divide-and-
conquer, backtracking, and the greedy method; construction
and analyzing algorithms for knapsack and bin-packing,
searching and sorting, and graph problems involving spanning
trees, shortest paths, and cycle generation.

(Subsequently changed to Computer Science 533)

BIOLOGY

NEW COURSE: 551. Colloquium in Biology. Fall and Spring (1 credit over two semesters). Staff.

Weekly meetings to review current literature in selected topics. Open to all interested in biological research, but active participation required of enrolled members. Formal registration required for one semester each academic year to receive credit, but all graduate students must participate throughout their first four semesters in residence. A maximum of two credits may be counted toward M.A. degree course requirements. Graded "P" (Pass) or "F" (Failure).

CHANGE: 569. Changed credit hours from 4 to 2. Changed laboratory hours from 6 per week to 4 on alternate weeks.

COMPUTER SCIENCE

NEW COURSES: 510. Ethics of Computing. Fall and Spring (1). Staff.

Topics include security and privacy issues, professional ethics for programmers, the role of computer scientists in determining the direction of technological innovation, and a basic introduction to classical ethical theory.

520. Elementary Topics. Fall and Spring (1, 2, or 3 credits depending upon material). Staff.

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

523. Finite Automata and Theory of Computation. Fall (3). Staff.

Theory of sequential machines, finite automata. Turing machines, recursive functions, computability of functions.

530. Computer Languages. Fall and Spring (1, 2, or 3 credits, depending upon material). Staff.

Topics include syntax, semantics, and pragmatics of one computer language, as well as the language's intended areas of applications which influenced its design. There will usually be a programming project in this course. The language studied will vary, and students may repeat the course for different languages.

535. <u>Software Tools and Environments</u>. Fall or Spring (3).
Staff.

The course covers the design, construction, and integration of
software tools to support the programmer. Software tools such
as pattern matchers, spelling checkers, lexical analyzers,
parser generators, and configuration controllers are discussed
along with command languages which make efficient use of these
tools. Several contemporary programming environments are
surveyed.

551. <u>Artificial Intelligence I</u>. Fall (3). Staff.

Problem solving techniques including state-space searching,
hill-climbing, and/or graphs, and game-playing. Knowledge
representation schemes such as frames, rules, and predicate
calculus. Perception, natural language understanding, and
learning.

552. <u>Semantics of Programming Languages</u>. Fall or Spring (3).
Staff.

The study and use of formal techniques in the design of pro-
gramming languages including attribute grammars, interpretive
semantic models, data abstraction, and algebraic specifica-
tion. The application of these techniques to programming
will be shown.

554. <u>Network Systems and Design</u>. Fall or Spring (3). Staff.

The physical characteristics and topology of networks; the
structure and protocol for messages; the physical, network,
and transport layers; and network performance evaluation and
modeling.

556. <u>Systems Simulation I</u>. Fall (3). Staff.

Introduction to finite probability theory and simulation.
Topics include discrete sample spaces, combinatorial analysis,
discrete distributions, Markov processes, time-dependent
stochastic processes, and queueing theory.

557-567. <u>Computer Graphics I, II</u>. Fall or Spring (3, 3).
Staff.

Introduction to computer graphics and its applications. Topics
include coordinate systems, the relationship between continuous
lines and discrete displays, two and three dimensional trans-
formations, clipping and windowing, geometric modeling, solid
modeling, hidden line removal, perspective transformations.
Input/output devices, parallel processing for real-time
graphics, interactive protocols, standards for graphics
packages, and abstraction of graphical data types.

561. <u>Artificial Intelligence II</u>. Spring (3). Staff.

Advanced aspects of problem-solving techniques and expert systems. Production systems, the predicate calculus and resolution theorem proving, rule-based deduction systems, and plan-generating systems.

564. <u>Microprocessor Systems</u>. Fall or Spring (3). Staff.

Review of basic logic and computer design. Comparison of microprocessor architectures. Microprocessor programming. Interfacing techniques, I/O structures, interrupts, and DMA operations. Hardware and software design of embedded microprocessor based systems. Single chip microcontrollers, multiple microprocessor systems, and bit slice microprocessors.

565. <u>Software Engineering II</u>. Spring (3). Staff.

Proving correctness of programs including axiomatic and functional correctness. Formal derivation techniques. Correctness of parallel programs.

566. <u>Systems Simulation II</u>. Spring (3). Staff.

The generation and use of random numbers, the design of simulation models, simulation languages, and the special problems of real-time simulation are discussed.

575. <u>Human Factors</u>. Fall or Spring (3). Staff.

Human factors are considered in the development and use of systems involving computers. The interfaces among customers, users, designers, and programmers are discussed. Emphasis is placed on user-friendly communication at all levels of software production, use and maintenance. Topics include elucidating requirements, clarifying specifications, designing programming environments, analyzing programming languages, and designing user interfaces.

585. <u>Program Testing</u>. Fall or Spring (3). Staff.

Program testing techniques and theory are surveyed. Topics include program correctness, structural testing, functional testng, data flow analysis, symbolic execution, mutation testing and test data generation.

CHANGES: Course Renumberings:

Old Number	New Number
A.S. 510	C.S. 500
A.S. 520	C.S. 501
A.S. 521	C.S. 504
A.S. 532	C.S. 512
A.S. 530	C.S. 521
A.S. 531	C.S. 524
A.S. 537	C.S. 533
A.S. 542	C.S. 542
A.S. 541	C.S. 544
A.S. 562	C.S. 550
A.S. 575	C.S. 555
A.S. 560	C.S. 560
A.S. 552	C.S. 562
A.S. 567	C.S. 570
A.S. 571	C.S. 574
A.S. 566	C.S. 580
A.S. 561	C.S. 590

MATHEMATICS

NEW COURSE: 553. <u>Programming Techniques in Operations Research</u>. Spring (3). Staff.

Application of computer techniques to problems in Operations Research. Study and implementation of algorithms in areas such as PERT, dynamic programming, linear programming and search methods.

PSYCHOLOGY

NEW COURSES: 696. <u>Practicum in Family Therapy</u>. Spring (3-6). Rohrbaugh.

In this course the student is supervised in the practice of family therapy in a setting approved by the instructor. This course is the practicum training component of the spring semester of a fourth-year concentration in family therapy in the Psy.D. Program.

698. <u>Advanced Family Therapy II</u>. Spring (3). Rohrbaugh.

This course, a continuation of Advanced Family Therapy I, explores assessment and intervention in more detail and examines selected topics in the field.

CHANGE: 693. May be repeated for credit and not just taken by first-year students during their spring semester.

Committee on Graduate Studies:

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