Annual Report of the Committee on Graduate Studies to the Faculty of Arts and Sciences December 6, 1994

The Committee on Graduate Studies reports annually to the Faculty. This year's report contains the following sections: I. Overview; II. Generating New Resources through and for Graduate Education; III. Diversity; IV. Program Evaluation; V. Awards; VI. Data on Students and Degrees.

I. Overview

The 1993-94 academic year was marked by a number of significant accomplishments for our graduate programs. A record number of students earned degrees: 18 PhD's; 88 MA's; 37 MS's; and 17 MPP's. Our programs enrolled a strong group of new students, the most diverse in terms of race and ethnicity in our history. Richmond funded two budget initiatives aimed specifically at enhancing graduate programs: the Teaching Fellows Program with Thomas Nelson Community College and the Virginia Consortium of Science and Engineering Universities. These initiatives brought William and Mary three faculty positions. Despite the severe constraints on research funding nationally, this faculty increased external support by 20%, a clear indication of the strength of our graduate programs. We played a leadership role in the establishment of VILAP-HPCC, a joint program between the Institute of Computer Applications in Science and Engineering, NASA-Langley (LaRC), and Virginia universities in scientific computing. Also at LaRC, we were selected to serve as the lead university in EOS-DIS/DAAC (Earth Observing System Data and Information System/Distributed Active Archive Center), NASA's program to store and distribute satellite data from studies of the atmosphere. Graduate students from both Computer Science and the atmospheric science track of the Applied Science Program are working together on this challenging, multi-disciplinary project. The Committee on Graduate Studies also initiated a program to bring to school teachers courses in subject fields. We completed an evaluation of the PhD program in American Studies and undertook an evaluation of the graduate program in Mathematics. As the example of EOS-DIS/DAAC shows, our programs are finding new ways to work together for the benefit of our students. The successes of the past year provide continuing confirmation of the soundness of the planning principles that long have guided this faculty.

II. Generating Resources for and Through Graduate Education

Given the fiscal realities of the 1990's, we are challenged as never before to identify and secure the resources necessary for excellence in graduate education. Through initiatives undertaken by our students, faculty, departments and programs, and in the deans' office, we had notable success in generating new funds to support our programs.

1. State Budget Initiatives

a) Teaching Fellows. The 1994-96 budget contains continuing funding for our innovative program with Thomas Nelson Community College for training graduate students as teachers. Currently students from English and American Studies work at TNCC under the joint supervision of a William and Mary faculty member and TNCC faculty and administrators. Evaluations of the work of our graduate students at TNCC have been uniformly excellent. The program has been especially valuable for graduate students in master's programs who have completed the required course work but not the thesis. Richmond

provided funding for a faculty position to oversee the preparation of students as teachers and supervise their work at TNCC. We are planning to extend the program to include students in other disciplines. As part of our cooperative arrangement with TNCC, the College provides classroom space on campus for TNCC evening courses, an arrangement that saves commuting time and money both for TNCC students from the Williamsburg area and our Teaching Fellows.

b) Virginia Consortium of Engineering and Science Universities. VCES is a partnership between W&M's Applied Science and Computer Science departments and the engineering schools at Virginia Tech, the University of Virginia, and Old Dominion. Its purpose is to make available high quality, cost-effective doctoral education in engineering and applied science disciplines to students in this region and to strengthen even further the partnership between the universities and LaRC. VCES has opened offices in Hampton and has hired an executive director, Mr. David Chestnutt. Richmond funded a coordinated budget initiative which brought two faculty positions to each institution as well as Equipment Trust Fund monies to purchase distance learning systems that will tie together the four universities, LaRC, and the VCES classrooms and offices in Hampton. VCES has enhanced the already strong partnership between W&M and LaRC, and the two new faculty positions will enable Applied Science to expand from three to five faculty members.

We expect that the distance learning equipment (Picture-Tell) will be installed in time for use in the Spring Semester. While VCES courses will be given priority in scheduling, the equipment will be available for use by other departments and the professional schools. In fact, several departments already have expressed interest in using it. This fully interactive (voice and video) equipment will make it possible to offer courses at several locations at once.

c) Applied Research Center at CEBAF. The General Assembly provided funding for a major new research facility adjacent to CEBAF to be shared by William and Mary with researchers from Old Dominion and Christopher Newport Universities. Its purpose is to enable faculty and graduate students to work cooperatively with CEBAF in applied research and development. Dennis Manos, director of the Applied Science Program, serves as the College's representative on the building committee. The structure will contain approximately 10,000 sq. ft. in research and office space for William and Mary. Faculty from Applied Science, Physics, Biology, and Chemistry already are working on a number of promising applied research projects in conjunction with CEBAF scientists.

2. *New Consortium*

Virginia ICASE/LaRC Program in High Performance Computing & Communication (VILAP-HPCC). During the year, we helped to bring into existence this new consortial relationship between LaRC's ICASE and four Virginia institutions with recognized strengths in scientific computing: Virginia Tech, George Mason, ODU, and W&M. As a national center for research in applied mathematics and scientific computing, ICASE provides a unique setting for the development of graduate training in the emerging field of computational science and engineering (CSE). This interdisciplinary field is built on the recognition that the enhanced power of the computer has led to the emergence of a new way of doing science, one which focuses on modelling and simulation and one which is able to address problems of enormous complexity. However, as John R. Rice of Purdue points out, "traditional computer science, physical science, and engineering programs have not cross-trained their students beyond the college sophomore level" (IEEE Computer Science and Engineering, Spring 1994, p. 13). The aim of the Virginia program is to provide an interdisciplinary course of study, attractive funding packages, and challenging research opportunities for students from Physics, Applied Science and Computer Science. The program will foster study at the

interface between the abstractions of computer science and the realities of carrying out complex computational tasks.

3. *Faculty Research Funding*

During 1993-94 sponsored research funds awarded to the Faculty of Arts and Sciences increased by approximately 20%. These funds are an important source of support for graduate students, who in turn contribute in essential ways to many of the funded projects. Dramatic growth took place in Applied Science, where funding grew from $447,127 to $1,586,998. In addition, Applied Science was responsible for gifts of scientific equipment to the College worth approximately $1,000,000. The funding pattern in 1993-94 was also notable because of significant increases in several departments in disciplines where external funds are not plentiful, including English and Government.

4. *Graduate Student Funding*

Both at the department level and centrally, we encourage graduate students to apply for research support, and our students are achieving some notable successes. For instance, Margaret Mulrooney of American Studies, a student of Robert Gross, was one of 33 students nationally to earn NEH dissertation year grants. Remarkably, this was the second consecutive year that an American Studies student earned an NEH award. In psychology, Robert Smith, a student of Glenn Shean, was awarded $16,000 from the Department of Mental Health, Mental Retardation, and Substance Abuse. In Applied Science, a number of graduate students, working in association with faculty advisors, are responsible for writing proposals to LaRC and other agencies for continued support of their projects. The students include Donald Sandusky, Rachel Knudsen, and Robert Perez. These grants provide an essential source of funds to support the university; equally important, the experience of writing grant proposals prepares students for the highly competitive world of research funding.

5. *Graduate Courses for Teachers*

During 1993-94 we enhanced outreach activities to public school teachers by scheduling graduate courses at times and places that are convenient for the teachers. Physics, Modern Languages, Computer Science, Mathematics, and American Studies have developed new courses precisely to meet the needs of teachers. This program offers the College an opportunity to make a significant contribution to public education, K-12. At the same time, the program is a potential source of new revenue.

Conclusion

At all levels graduate programs have been successful in securing the resources, including space, equipment, and funds, which have enabled our programs to continue to grow. We expect that the 1994-95 academic year will be one of continuing growth.

III. Diversity

1. Recruitment

The entering class for 1994-95 was the most diverse ever. Of approximately 164 new students, 12 are African-American; 3 Native American; 2 Hispanic; and 16 Asian. This progress would not have been possible without the active support of the Committee on Diversity, which is composed of graduate students dedicated to the goal of helping the College enroll a student body which reflects the rich diversity of America.

2. William and Mary-Norfolk State Summer Program in History

The College and Norfolk State University co-sponsored a program in the summer of 1994 designed to help prepare students from underrepresented groups for graduate school. Six students enrolled in a pilot program, which was made possible by generous support from Provost Cell, Dean Lutzer, and Vice-President Sadler, as well as Norfolk State. The Commonwealth Center provided administrative support. Plans are underway for an expanded program for the 1995 summer.

IV. Graduate Dean's Fellowship

To provide support for doctoral candidates at a critical time in their careers, we instituted the Graduate Dean's Dissertation Fellowship which provides a year's stipend to a student who is completing a promising dissertation; in return, the student offers one course during the year in his or her specialty. The holder of the Fellowship is Jon Brudvig in History.

V. Awards

For the first year since the inception of the program in 1986, the State Council was unable to fund Commonwealth Fellowship Awards for outstanding Virginians who are doctoral candidates. As mentioned above, it was the second consecutive year a William and Mary American Studies student earned a NEH Dissertation Year Fellowship. This year's winner is Margaret Mulrooney. Approximately 30 fellowships are awarded annually. One student, Tracy Gibson, earned a SREB Fellowship from the Southern Regional Educational Board, and one student earned a Commonwealth Fellowship, awarded by the State Council for outstanding minority students.

Summary

In this brief narrative section, we have reviewed some of the highlights of a year of progress and achievement for our programs and students. In a difficult year for funding, research funding increased by 20%. Three new FTE positions came to the College through budget initiatives directed at enhancing graduate programs. We continued our progress in enrolling a diverse student body, and through new external alliances and internal cooperative arrangements, we have continued to position ourselves for additional growth.

VI. DATA ON STUDENTS AND DEGREES

A. ADMISSIONS - Fall Semester 1994

DEPARTMENT	[1]NUMBER APPLICANTS	[2]NUMBER ACCEPTED	NUMBER MATRICULATED
AMERICAN STUDIES	114	19	5
ANTHROPOLOGY	61	18	14
APPLIED SCIENCE	25	18	11
BIOLOGY	55	33	19
CHEMISTRY	14	11	9
COMPUTER SCIENCE	211	44	14
ENGLISH	104	30	17
GOVERNMENT	69	17	8
HISTORY	154	35	23
MATHEMATICS	39	23	9
PHYSICS	222	24	8
PSYCHOLOGY	82	10	5
PUBLIC POLICY	45	31	18
SOCIOLOGY	19	12	9
TOTALS	1,214	325	169
PSY.D. PROGRAM[3]	167	24	10

[1]Figures based on completed applications for fall admission as reported by each graduate department.

[2]Figures include all applicants offered admission as reported by each graduate department.

[3]Total in Consortium.

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

DEPARTMENT	FALL 1992	FALL 1993	FALL 1994
AMERICAN STUDIES	3.56 (14 of 20)	3.15 (19 of 22)	3.58
ANTHROPOLOGY	3.27	3.55	3.23
APPLIED SCIENCE	3.43	3.29	3.36
BIOLOGY	3.18	3.16	3.12 (18 of 19)
CHEMISTRY	2.93	2.78	2.98
COMPUTER SCIENCE	3.33	3.43 (19 of 20)	3.45
ENGLISH	3.52	3.52	3.30
GOVERNMENT	3.48 (11 of 12)	3.18	3.37
HISTORY	3.39 (18 of 21)	3.42 (24 of 26)	3.35 (20 of 23)
MATHEMATICS	3.51	3.43	3.46 (8 of 9)
PHYSICS	3.26	3.30 (5 of 6)	3.48 (7 of 8)
PSYCHOLOGY	3.34	3.17	3.48
PSY.D. PROGRAM	3.20	3.58	3.47
PUBLIC POLICY	3.28 (20 of 21)	3.19 (15 of 16)	3.08
SOCIOLOGY	3.13	3.35 (8 of 9)	3.12

C. AVERAGE GRADUATE RECORD EXAMINATION SCORES OF ENTERING STUDENTS[1]

DEPARTMENT	FALL 1993 VERB	MATH	ANALY	ADV	FALL 1994 VERB	MATH	ANALY	ADV
AMERICAN STUDIES	593 (17 of 22)	544 (17 of 22)	577 (17 of 22)	---	644	538	630	---
ANTHROPOLOGY	575	511	571	---	583 (13 of 14)	534 (13 of 14)	588 (13 of 14)	---
APPLIED SCIENCE	636 (5 of 11)	696 (5 of 11)	698 (5 of 11)	---	588 (9 of 11)	666 (9 of 11)	670 (9 of 11)	---
BIOLOGY	596 (8 of 9)	689 (8 of 9)	698 (8 of 9)	674 (69%) (8 of 9)	583 (18 of 19)	622 (18 of 19)	655 (18 of 19)	698 (16 of 19)
CHEMISTRY	---	---	---	---	546 (5 of 9)	606 (5 of 9)	596 (5 of 9)	---
COMPUTER SCIENCE	608	708	671	NRD	566	704	650	683 (4 of 14)
ENGLISH	656	584	621	602 (78%)	664	535	635	585
GOVERNMENT	648	585	640	NRD	628	679	683	557 (3 of 8)
HISTORY	635	590	665	NRD	627 (22 of 23)	568 (22 of 23)	643 (22 of 23)	519 (16 of 23)
MATHEMATICS	516 (7 of 9)	649 (7 of 9)	626 (7 of 9)	NRD	514 (8 of 9)	713 (8 of 9)	671 (8 of 9)	600 (2 of 9)
PHYSICS	556 (5 of 6)	714 (5 of 6)	660 (5 of 6)	568 (73%) (5 of 6)	546	721	626	691
PSYCHOLOGY	529	617	562	568 (62%) (8 of 9)	562	648	638	605 (4 of 5)
PSY.D.	617	612	663	629 (81%)	587	617	615	589
PUBLIC POLICY	559	644	676	---	590 (16 of 18)	634 (16 of 18)	648 (16 of 18)	---
SOCIOLOGY	501 (8 of 9)	543 (8 of 9)	589 (8 of 9)	NRD	534	563	574	---

[1]Table includes all regular and provisional students. Scores on the advanced portion of the GRE are not reported unless at least 70% of the enrolling students took the test.

D. REGISTERED REGULAR & PROVISIONAL GRADUATE STUDENTS[1]
Fall 1992 to Fall 1994

DEPARTMENT	FALL 1992	SPRING 1993	FALL 1993	SPRING 1994	FALL 1994
AMERICAN STUDIES	53	49	54	49	40
ANTHROPOLOGY	14	13	18	13	23
APPLIED SCIENCE	22	33	37	37	44
BIOLOGY	25	19	24	27	37
CHEMISTRY	13	11	6	4	10
COMPUTER SCIENCE	66	63	65	57	56
ENGLISH	23	22	22	24	21
GOVERNMENT	17	18	19	14	13
HISTORY	55	53	64	61	60
MATHEMATICS	17	10	18	11	16
PHYSICS	60	55	52	50	48
PSYCHOLOGY	16	16	17	16	14
PUBLIC POLICY	40	39	37	36	32
SOCIOLOGY	15	14	20	16	16
A & S TOTALS	436	415	453	415	430
PSY.D. PROGRAM[2]	54	50	60	54	55

[1]Totals include both full-time and part-time registration.

[2]Total in Consortium.

E. GRADUATE DEGREES CONFERRED 1993-94

DEPARTMENT	DEGREE	AUGUST 1993	DECEMBER 1993	MAY 1994	TOTAL
AMERICAN STUDIES	M.A.	2	5	3	10
	Ph.D.	1	1	0	2
ANTHROPOLOGY	M.A.	0	1	11	12
APPLIED SCIENCE	M.A.	0	0	1	1
	M.S.	1	0	0	1
	Ph.D.	0	0	1	1
BIOLOGY	M.A.	4	1	3	8
CHEMISTRY	M.A.	3	6	2	11
	M.S.	0	0	0	0
COMPUTER SCIENCE	M.S.	0	3	13	16
	Ph.D.	1	2	1	4
ENGLISH	M.A.	6	3	8	17
GOVERNMENT	M.A.	2	0	5	7
HISTORY	M.A.	2	2	3	7
	Ph.D.	0	1	3	4
MATHEMATICS	M.A.	0	0	0	0
	M.S.	0	6	3	9
PHYSICS	M.A.	0	0	0	0
	M.S.	0	2	9	11
	Ph.D.	0	3	4	7
PSYCHOLOGY	M.A.	3	0	6	9
	Psy.D.	1	3	2	6
PUBLIC POLICY	M.P.P.	0	0	17	17
SOCIOLOGY	M.A.	1	1	4	6
TOTALS	M.A.	23	19	46	88
	M.S.	1	11	25	37
	M.P.P.	0	0	17	17
	Ph.D.	2	7	9	18
	Psy.D.	1	3	2	6

F. GRADUATE DEGREES AWARDED DURING THE LAST 10 YEARS[1]
(August - June)

DEPARTMENT	PROGRAM INITIATED	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93	93-94	8/94	TOTAL SINCE AUG. 1984
AMERICAN STUDIES	1982-MA	4	5	2	3	4	11	14	8	12	10	2	75
	1988-PhD					0	0	0	0	1	2	0	3
ANTHRO-POLOGY	1979-MA	1	4	8	4	8	9	8	7	5	12	1	67
APPLIED SCIENCE	1970-MA/MS	1	2	0	0	0	0	1	1	1	2	2	10
	1990-PhD							0	0	1	1	0	2
BIOLOGY	1963-MA	8	7	2	7	5	10	4	5	7	8	7	70
CHEMISTRY	1964-MA/MS	9	5	5	4	5	7	4	5	7	11	0	62
COMPUTER SCIENCE	1984-MS	9	10	19	10	15	19	15	13	23	16	0	149
	1986-PhD			0	1	0	3	0	3	2	4	1	14
ENGLISH	1970-MA[2]	9	5	8	9	10	9	18	11	15	17	4	115
GOVERNMENT	1966-MA	1	5	3	6	8	8	9	10	4	7	2	63
HISTORY	1955-MA	11	5	14	13	7	16	13	10	10	7	5	111
	1967-PhD	2	1	4	1	1	5	2	9	6	4	1	36
MATHEMATICS	1961-MA/MS	6	4	7	2	9	5	10	6	8	9	0	66
PHYSICS	1959-MA/MS	11	9	5	8	6	14	8	10	8	11	2	92
	1964-PhD	5	6	4	5	3	6	6	7	7	7	1	57
PSYCHOLOGY	1953-MA	9	5	4	6	3	11	5	7	7	9	1	67
	1978-PsyD	4	8	8	8	10	14	8	7	5	6	7	85
PUBLIC POLICY	1991-MPP								0	18	17	1	36
SOCIOLOGY	1967-MA	5	2	3	4	6	5	5	5	2	6	0	43
A&S TOTALS:	MA-MS-MPP	84	68	80	76	86	124	114	98	127	142	27	1026
	PhD	7	7	8	7	4	14	8	19	17	18	3	112
	PsyD	4	8	8	8	10	14	8	7	5	6	7	85

[1]See Table E for M.A. in Education degrees.

[2]Earlier Program suspended in 1963.

CURRICULUM CHANGES
Approved for 1994-95

NEW COURSES

Amst 503.	History of Multiculturalism in America
Apsc 518.	Spectroscopic Characterization of Polymers
Apsc 563.	Colloquium in Applied Science
Apsc 577.	Numerical Methods for Applied Scientists I
Apsc 578.	Numerical Methods for Applied Scientists II
Apsc 623.	Advanced Quantitative Nondestructive Evaluation
Apsc 683.	Theoretical Fluid Dynamics
Bio 551.	Topics in Entomology
Bio 565.	Topics in Endocrinology
Bio 573.	Topics in Developmental Biology
Bio 575.	Topics in Neurobiology
Bio 578.	Topics in Molecular Cell Biology
Col 510.	Seminar in Spanish (offered for high school teachers)
Csci 509.	Concepts of Computer Science for School Teachers
Csci 540.	The Computing Profession and Society
Csci 553.	Analysis of Algorithms
Csci 564.	Advanced Operating Systems
Csci 586.	Discrete-State Stochastic Models
Csci 598.	Research Project
Hist 659.	Topics in History
Soc 573.	Classical Theory and the Crisis of Modernity

CHANGES

Bio 553.	Molecular Biology Laboratory. Changed credits from 2 to 1.
Bio 582.	Graduate Colloquium. Students may receive one credit for each semester of registration up to a maximum of four semesters.

Csci 513. Algorithms. Old Number and Title: Combination of 501--Data Structures and 533--Analysis of Algorithms

Csci 531. Artificial Intelligence. Old Number: 551

Csci 534. Network Systems and Design. Old Number: 554

Csci 561. Robotics. (Revised course description)

Psyc 555. Applied Decision Theory. Old Number and title: 500--Topics in Psychology

The graduate application fee was increased from $20 to $30.

Committee on Graduate Studies:

Christopher Abelt, Chemistry
Norman Barka, Anthropology
David Dessler, Government
David Finifter, Public Policy
John M. Finn, Physics
Sidney Lawrence, Mathematics
Dennis Manos, Applied Science
John D. Milliman, VIMS
Don A. Monson, Modern Languages
Robert Noonan, Computer Science
Monica Potkay, English
Margaret Saha, Biology
John Selby, History
Kelly Shaver, Psychology
Kathleen Slevin, Sociology
Alan Wallach, American Studies
Neill Watson, Clinical Psychology
Robert J. Scholnick, Chair