Committee on Graduate Studies
Report to the Faculty
July 2022 - June 2023

Introduction 1
Report Items 2
Course Approvals and Revised Degree Requirements 4
Graduate Center Annual Report 16
A&S Graduate Ombudsperson Report for August 2022 – June 2023....18
Committee on Graduate Studies Members, 2022-23 19
Appendices 20
Appendix I – Graduate Center Participation....21
Appendix II – Applied, Accepted, and Enrolled....22
Appendix III – Graduate Student Enrollments....23
Appendix IV – Graduate Student Enrollment by Degree 24
Appendix V – Graduate Degrees Awarded....25

Introduction

William & Mary (W&M) identifies itself as a premier public research university, a designation that is as much tied to the excellence of its graduate programs as its reputation as an undergraduate liberal arts and sciences institution. Arts & Sciences (A&S) contributes to graduate education and graduate-level research through eleven selective programs: six are Ph.D. granting (Anthropology, American Studies, Applied Science, Computer Science, History, Physics), three offer terminal research master's degrees (Biology, Chemistry, Psychological Sciences) and two offer terminal professional master's degrees (Computational Operations Research, Public Policy). The strength of the graduate programs at W&M places us in a more competitive peer group, with higher average faculty salaries. Our competitiveness with peer and aspirational peer institutions helps attract new faculty, students, and staff, as well as instructional, research, and infrastructure resources that otherwise would not be available to us.

Aside from producing graduates with advanced training who are ready for leadership positions across a broad spectrum of careers, graduate studies in A&S contributes to another fundamental goal of any research university: meaningfully advancing the frontiers of knowledge in all represented disciplines. In several key areas, the contributions of graduate research assistants are considered essential to achieving this goal, and their presence is critical to recruiting and retaining the strongest research-active faculty. The inability to provide enough doctoral students to work with research-active faculty members has caused some to leave W&M. The departure of these research-active faculty members represents a substantial scholarly, pedagogical, and financial loss to the University.

The research conducted by A&S graduate programs also enables a large proportion of the undergraduate research opportunities offered on campus, including in research areas that would not be available otherwise. Graduate students help mentor undergraduate researchers and facilitate faculty-undergraduate research collaborations. As undergraduate research is an important component of W&M's mission, recruiting and supporting research-active graduate students also strengthens our ability to deliver a distinctive undergraduate educational experience. In addition, A&S graduate students enrich the undergraduate program by serving as tutors, writing preceptors, lab and discussion section leaders, teaching assistants, instructors, and graders in courses with high

enrollments and those central to the COLL curriculum.

Report Items

- *Criteria for approval of additional employment.* In its October 24, 2022 meeting, COGS revised the criteria for the approval of additional employment for students holding graduate assistantships. The previous 9 hour-per-week limit on additional employment was changed so that "the number of hours of additional employment plus the number of hours worked as a graduate assistant may not exceed 29 hours per week." For students with full graduate assistantships, which accounts for 20 hours per week of effort, this still corresponds to a maximum of 9 additional hours of work per week. However, students who have less than 20 hours per week of assigned TA or RA duties (commonplace in our professional master's programs) can now request more than 9 hour per week of additional work, subject to the limit on total hours stated above. In addition, Vice Dean Carone indicated that the past practice of only approving requests for additional employment that related in some way to the student's program of study would be discontinued. This acknowledges that any source of additional income may reduce a graduate student's financial insecurity and indirectly benefit their progress towards the degree.

- *Revision of admissions questions seen by all Graduate A&S applicants.* The application for admission to graduate school in A&S includes some questions that all applicants must answer, independent of discipline. These questions were far from optimal; for example, one asked "Have you been a teacher or mentor to preschoolers or senior citizens?" In its November 7, 2022 meeting, COGS revised these universal questions, which now consist of the following three: (1) Describe any experience you have with teaching, mentoring or outreach. This is not limited to the classroom or a formal setting. (2) Describe any thesis, project, essay, internship or research experience. List any relevant posters/presentations/reports/publications. (3). Provide any additional information regarding your background, extracurricular activities or general experience (maximum 3500-character limit). The new application questions are less incongruous when compared with those found in the applications of peer institutions.

- *Graduate Record Exam (GRE) requirements.* In its December 5, 2022 meeting, COGS unanimously approved that "Requirement of Graduate Record Exam (GRE) scores, for both the general and subject tests, shall be at the discretion of each program in Arts & Sciences." This was endorsed by a vote of the faculty of Arts & Sciences (84% to 0%) on February 7, 2023. After the A&S faculty meeting, University Counsel advised that the Board of Visitors had delegated the power to approve changes in admission requirements to the Provost and President. Shortly afterwards, both gave their approval. All graduate programs in A&S subsequently eliminated the mandatory submission of GRE scores; this is indicated by the Graduate Course Catalog changes summarized later in this report. Allowing A&S programs to eliminate the GRE requirement is critical to maintaining W&M's competitiveness in graduate recruitment, given the trend at peer institutions to do away with the GRE requirements.

- *Admissions Summary.* Around the time of the final COGS meeting of the Spring 2023 semester, the eleven graduate directors reported on the results of their recruiting efforts for Fall 2023 admissions. **American Studies** recruited a full class of 4 funded M.A./Ph.D. and Ph.D. students, and 5 unfunded M.A. students. Examples of institutions chosen by applicants who declined American Studies admissions offers include Rutgers, the University of Virginia, and Georgetown. **Anthropology** had 28 completed applications for the MA/PhD and PhD programs, with 4 enrolling; there were 15 completed applications for the MA program with 5 enrolling. The female to male ratio was 2 to 7. Anthropology reports that the applicant pool was one of the strongest ever. **Applied Science** reports that 187 individuals started applications on the online portal (an increase of 150 over the previous academic year). There were 56 completed or near-completed applications; the department extended offers to 16 with the goal of matriculating 10. This year saw the first cohort of 5 data science doctoral students

admitted into the program. **Biology** had 31 completed applications with an average GPA of 3.32; Biology made 11 offers and received 7 acceptances. All seven incoming students are from institutions outside W&M. **Chemistry** had 12 completed applications for 6 available spots with Office of Graduate Studies (OGS) funding. The 12 submitted applications represent 7 fewer than the previous year. Of the 6 students recommended for admission, 3 identify as women. Half of the six were from institutions other than William & Mary. **Computational Operations Research** (COR) reports that the total number of submitted and in-progress applications returned to pre-pandemic levels. Of 14 students who were offered admission, 12 accepted. Of the matriculating students, 2 are international and 10 domestic, with two of the latter in the military; their average undergraduate GPA was 3.60. A record number of William & Mary students (5) will pursue the M.S. degree in one year. **Computer Science** received 114 submitted applications for Fall 2023: 42 MS applications and 72 PhD applications. An additional 197 applications were started but were not submitted. Of the 72 Ph.D. applicants 21 formally accepted, including one who received a Zable Recruitment Fellowship. The number of applications to the Ph.D. program almost doubled compared to the previous year. **History** received 105 applications, 34 for the M.A. and 71 for the Ph.D. Seven Ph.D. offers were made, and 4 accepted. Two current M.A. students who applied to continue on to the Ph.D. were accepted. With 7 master's students accepting admissions offers, the incoming cohort consists of 11 new students while 2 students were added to the second-year cohort. History attributes recent difficulties in recruiting Ph.D. students to W&M stipends that are falling behind those of its competitors. **Physics** had 53 complete applications, down from 65 in the previous academic year. The target class size was 9 and they successfully recruited 7 (all male), with one additional student (female) accepting but deferring admission to Fall 2024. Physics reports that their acceptance rate was mostly unchanged since the previous year. The lowest undergraduate GPA of the matriculating students was 3.5. **Psychological Sciences** had 155 applications submitted for 8 available slots. This is approximately the same number as the previous year. All slots were filled. Six of the 8 are students of color, 6 identify as women and 2 are international students. Psychological Sciences attributes their success in recruiting a diverse class to an increase in advertising their program to minority-serving institutions and to a successful Zoom Diversity Open House in Fall 2022. **Public Policy** had an incoming class of 9 MPP students and 7 BA/MPP students. There were a larger number of applicants than the previous year with most international applicants coming from Africa.

For those members of the Faculty of Arts & Sciences interested in further details regarding COGS discussions and decisions, copies of the COGS minutes are available upon request from the Office of Graduate Studies.

Updates from the A&S Office of Graduate Studies (OGS):

- *Budgetary constraints on outstanding admissions offers.* After discussing the issue at the September 12, 2022 COGS meeting, the Vice Dean implemented controls over admissions to assure that available resources are not exceeded due to fluctuations in acceptance rates. In particular, the number of outstanding admissions offers plus the number of acceptances at any given time may not exceed the projected number of funded OGS TA slots. By the middle of the Fall semester, the Vice Dean issued a memo to the Graduate A&S programs specifying the admissions caps for each, given the number of funded slots available. The Vice Dean will continue this practice in coming years.

- *Graduate & Honors Research Symposium.* After a hiatus due to the pandemic, a graduate research symposium was resumed in Spring 2023. Unlike the past events, the 2023 symposium involved both graduate students and undergraduate honors thesis students. Hence, the symposium was renamed the "Graduate & Honors Research Symposium" (GHRS). The GHRS was hosted jointly by the A&S Office of Graduate Studies, the Graduate Center (led by Sarah Glosson) and the Charles Center (led by Elizabeth Harbron). By all accounts, the event was a success, illustrating the synergies between undergraduate and graduate research in Arts & Sciences. A similar event is planned for Spring 2024.

- *Graduate Center Space Requests.* When the OGS was in Stetson Hall, the Graduate Center had space on the first floor that was inadequate. That space was lost when the OGS moved to the third floor of Blow Memorial Hall in Fall 2022. In the Summer of 2023, with support from the Dean of the Faculty of Arts & Sciences, the Vice Dean submitted a request for space to be allocated for the Graduate Center. Space in Ewell Hall was provided, including the room that was previously the Music Library; this will be described in detail in the next annual report as approval from the Space Management Committee was secured after the reporting period, in July 2023.

- *Health insurance Planning Budget Request*. A Planning Budget Request (PBR) was submitted by Arts & Sciences to the central Budget Office for additional support for graduate student health insurance. The OGS currently provides 75% of the premium expense, with each graduate program contributing the remaining 25%. The PBR would have allowed OGS to provide 100% of the health insurance premium expense. The request was denied. This PBR, like many other FY24 PBRs, was adversely affected by the delay in the approval of the state budget by the Virginia legislature.

- *Graduate Student Parking.* The OGS submitted a proposal to Bill Horacio, the Director of Parking and Transportation Services, that would have allowed graduate teaching assistants to use faculty parking spaces during times when they had scheduled teaching duties. The request was denied. Mr. Horacio felt that the proposal would lead to protests from faculty given the limited number of parking spaces available. He proposed no other solutions to the problem of inadequate parking for graduate students.

Course Approvals and Revised Degree Requirements

GRADUATE REGULATIONS

The following changes were approved by COGS on October 24, 2022.

Graduate Assistantships, Scholarships, and Fellowships

2022-2023 catalog: Approval from the Vice Dean for Research and Graduate Studies for additional employment/appointment of a remunerative nature of no more than 9 additional hours per week, will be based on supporting written statements from the student's thesis/dissertation advisor and Director of Graduate Studies that the additional employment is not anticipated to adversely affect the student's progress toward the degree.

Replaced with: Approval from the Vice Dean for Research and Graduate Studies is required for additional employment/appointment of a remunerative nature. The number of hours of additional employment plus the number of hours worked as a graduate assistant may not exceed 29 hours per week. For fully supported assistantships, this represents no more than 9 additional hours per week. Requests will only be considered from students in good academic standing. Approval of the Vice Dean for Research and Graduate Studies will be based on supporting written statements from the student's thesis/dissertation advisor and Director of Graduate Studies that the additional employment is not anticipated to adversely affect the student's progress toward the degree.

The following changes were approved by COGS on March 9, 2023.

A&S: Admission

Degree Seeking Students

For admission an applicant must have completed the requirements for a bachelor's degree at an accredited institution, must have a cumulative grade point average of 3.0 or more on a 4.0 scale, and must have the recommendation of the graduate committee in the program in which he or she intends to study for a degree. The requirement of a minimum cumulative grade point average of 3.0 can be waived. The petition for such a waiver is handled by the Arts & Sciences graduate program to which the candidate is seeking admission, with approval for the waiver at the discretion of the Committee on Graduate Studies and ~~and the Assistant Dean of Graduate Studies.~~ the Vice Dean for Research and Graduate Studies.

The following changes were approved by COGS on April 6, 2023.

A&S: Admission

Graduate Record Exam (GRE) Scores

Scores from the GRE General Test and/or the GRE Subject Tests are not required by any graduate department or program in Arts & Sciences. The optional submission of GRE scores is allowed, unless otherwise indicated by a department or program. Please consult the "Departments and Programs" section of this catalog for further information.

~~The results of all three portions of the GRE General Test must be received directly from the Educational Testing Service (ETS). Use the William & Mary institution code 5115 to ensure that your scores are sent to William & Mary. Only scores sent directly to William & Mary by ETS will be accepted. If you take the computer-delivered GRE General Test, your official scores will be available in your ETS Account and sent to the institutions you designated approximately 10-15 days after your test date. ETS releases electronic test scores to institutions every Wednesday and Friday after 6 pm. If you take the paper-delivered test, your official scores will be available in your ETS Account and sent to the institutions you designated within five weeks after your test date. For individuals testing on or after July 1, 2016, GRE test scores are valid for five years after your test administration date. For example, scores for a test taken on July 3, 2019, are reportable through July 2, 2024. For tests taken prior to July 1, 2016, scores are reportable for five years following the testing year in which you tested (July 1-June 30).~~

A&S: Admission

Official Transcripts

William & Mary reserves the right to assess whether transcripts submitted electronically or directly by the applicant in the institution's sealed and stamped envelope will be considered official. Final official transcripts (that update the official transcripts required for the admission decision) must be submitted by the end of the first semester after matriculation. Students who have not provided the required documents by this deadline may be suspended from their

program at the discretion of the Vice Dean for Research and Graduate Studies.

AMERICAN STUDIES

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

~~GRE scores taken within the past five years~~ GRE scores are not required nor will they be accepted as part of applications for admission.

ANTHROPOLOGY

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

Admission is competitive, based on such criteria as grade point average, ~~GRE scores,~~ letters of recommendation, experience, educational history, a writing sample, and a personal essay.

William & Mary uses an online application system. Application materials consist of ~~GRE scores taken within the past five years,~~ official transcripts from all higher education institutions attended, three letters of recommendation, a personal statement in essay format and a writing sample.

The following changes were approved by COGS on May 4, 2023.

COURSE REQUIREMENTS

Anthropology, Historical Archaeology or Historical Anthropology Specialization, Sequential M.A./Ph.D.

Electives

~~Course electives shall include one graduate-level course in Linguistic Anthropology and one graduate-level course in Biological Anthropology.~~ Course electives shall include one graduate-level course in Biological Anthropology. Students will use the remaining electives to focus their studies in either Historical Archaeology or Historical Anthropology. Selection of electives should be made in consultation with the advisor to ensure an appropriate course of study.

COURSE REQUIREMENTS

Anthropology, Historical Archaeology or Historical Anthropology Specialization, Sequential Ph.D.

Electives

~~Course electives shall include one graduate-level course in Linguistic Anthropology and one graduate-level course in Biological Anthropology.~~ Course electives shall include one graduate-level course in Biological Anthropology. Students will use the remaining electives to focus their

studies in either Historical Archaeology or Historical Anthropology. Selection of electives should be made in consultation with the advisor to ensure an appropriate course of study.

APPLIED SCIENCE

The following changes were approved by COGS on April 6, 2023.

COURSE ADDITION:

APSC 645 - Lipids: From Biochemistry to Diseases and Applications

Fall (3) Cotten. Prerequisite(s): Consent of the instructor. Biol/Chem 314 (Biochemistry) or the equivalent is highly recommended.

This multi-disciplinary course will deepen basic lipid biochemistry knowledge, with a focus on how lipids contribute to (dys)functions at the chemical, molecular and cellular levels, thereby influencing vital biological processes. Specific areas explored will include the properties and functions of lipids involved in biological membranes and intracellular signaling; the biological significance of protein-lipid interactions; the influence of pathogenic lipids on host cell homeostasis; the technical approaches employed to characterize their functions, and the therapeutic approaches used to target lipid-related diseases. Assignments will emphasize reading the original literature, writing a proposal that extends current work in the field, and developing advanced analytical and problem-solving skills.

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

William & Mary uses an online application system. Application materials include ~~GRE scores taken within the past five years,~~ transcripts and three letters of recommendation. Minimally, each applicant must have a Bachelor's degree with a major in a physical or natural science, mathematics, or an engineering discipline. If English is not your first language, your Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) scores are required and must be sent directly to William & Mary by the Educational Testing Service or IELTS and you are strongly encouraged to make a Skype appointment with department admissions staff. For full consideration, review of applications begins 5:00 p.m. the first Friday of February for entrance in the Fall or Summer semester. Spring semester applications must be completed by 5:00 p.m. the second Friday in October. Applications submitted after the program's deadline may be evaluated if space is available.

COURSE ADDITION:

APSC 629 - Optical Microscopy - Fundamental & Applications

Fall (3) Schniepp. Prerequisite(s): Instructor Permission

For centuries, optical microscopy has been an essential tool for fundamental research and applications in physical sciences, life sciences, and engineering alike. This course first

introduces the fundamentals of optics necessary to rigorously understand the imaging and contrasting mechanisms of optical microscopes and their capabilities, including the wave nature of light and the resulting diffraction limit. Opportunities, limitations, and practical aspects of optical imaging are then discussed. The course then treats optical microscopes, their different modes of imaging/spectroscopy operation, and their application. Some of the latest technological developments and advancements of light microscopy are introduced.

BIOLOGY

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

The Department of Biology at William & Mary offers a two-year, research-intensive master's program where students are supported by teaching assistantships and full tuition waivers. Graduate research opportunities exist in four broad areas: behavioral biology, developmental biology, ecology and evolutionary biology, and molecular and cell biology. With a low student to faculty ratio (approximately 8-10 new students each year with 25 full-time faculty), we offer an intimate and highly personalized research and education experience rarely attainable at larger universities. Also, our graduate students often work closely with and mentor undergraduates, providing numerous informal teaching and personal development opportunities. Specific information about our graduate students and faculty can be found here. The Biology Department will not accept Graduate Record Examination (GRE) scores as part of an application to our M.S. or M.A. program.

CHEMISTRY

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

~~All applicants must submit scores for the aptitude portions of the Graduate Record Exam taken within the past five years, transcripts, and three letters of recommendation. The subject portion (Chemistry) is recommended but not required. The Graduate Admissions Committee of the Chemistry Department considers admission to the Chemistry Master's degree programs. Applicants interested in earning a Ph.D. in Applied Science based on research with one of the Chemistry faculty have the options of applying directly to the Ph.D. program in Applied Science or of applying to the Chemistry M.S. degree program with the intent of later applying for admission to the Ph.D. program in Applied Science.~~

William & Mary uses an online application system. Application materials consist of official transcripts and three letters of recommendation. The general and Chemistry subject GRE scores are not required but may optionally be supplied. The absence of GRE scores will not negatively affect the application. If English is not your first language, your Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) scores are required and must be sent directly to William & Mary by the Educational Testing Service or IELTS. Upon the recommendation of the chemistry program the TOEFL/IELTS requirement

can be waived for applicants who will have received a degree from a college or university in which English is the primary language of instruction.

COMPUTER SCIENCE

The following changes were approved by COGS on November 7, 2022. A second motion was passed by COGS approving students who matriculated under a previous catalog permission to use this new course CSCI 795 towards their degree requirements.

COURSE ADDITION:

CSCI 795 - Directed Dissertation Research

Fall and Spring (3-12) Staff. Graded Pass/Fail. Note: Students who are not submitting a dissertation may not use this course to satisfy degree requirements.

Students design and conduct research in support of their dissertation under the direction of a faculty advisor. This course may be repeated, but no more than 12 semester credit hours may be used to satisfy degree requirements for a student submitting a dissertation.

The following changes were approved by COGS on December 5, 2022.

COURSE ADDITION:

CSCI 536 - Data Mining

(3) Prerequisite(s): CSCI 303 and MATH 211 and MATH 212

The past few years have witnessed a boom of big data in different areas, including commercial platforms, healthcare, social networks, business, finance and more. Extracting useful and valuable information from big data can help improve quality of life and make our world a better place. The goal of this course is to introduce the fundamental concepts and techniques in data mining. Specifically, this course will cover the basic data mining concepts, graph mining, traditional clustering and classification models as well as the latest deep learning techniques. This course can help undergraduate students find a position of data scientist after graduation and do some data mining related projects for post-graduate study. In this course, students are required to do machine programming assignments, and take midterm and final exam. Cross-listed with CSCI 436

Programs

Admission requirements for the M.S. and Ph.D. in Computer Science

Students seeking the M.S. or Ph.D. degrees in computer science are expected to have a background that includes the following:

- Mathematics: two calculus courses and one linear algebra course.

- Computer Science: two introductory programming courses (CS1 and CS2 in the standard computer science curriculum) and ~~and one course in each of discrete mathematics, data structures, algorithms, and computer organization.~~ a cohort of courses that may include: discrete mathematics, data structures, algorithms, and computer organization.

Applicants lacking sufficient background may be admitted provisionally into the M.S. program or admitted as Bridge to the M.S. students. In that case, the department will establish a suitable set of qualifying courses at the time of admission. To achieve regular status, bridge or provisionally accepted students must earn at least a B- in each qualifying course. There is no provisional admission into the Ph.D. program.

Computer Science, Bridge to the M.S.

The Bridge to M.S. option is intended for students that want to obtain a Master of Science degree in Computer Science but who might be missing some prerequisite background in the discipline. The Bridge to M.S. students will be provided with a tailored curriculum of prerequisite courses and each student will be assigned a dedicated advisor. A student's prior experience (either academic or professional), will determine the starting point in the course work.

The Bridge to M.S. students will focus more on hands-on experience and less on research in the discipline. Students may enroll part-time or full-time. Students with some related experience will be able to skip some portions of the coursework. Students that meet a minimum GPA in bridge coursework will seamlessly continue in the Computer Science M.S. program.

W&M computer science does not offer specializations, but students have great freedom in choosing their courses, thus it is possible to specialize in a particular field (assuming courses are offered in that field).

Course Requirements before moving to M.S. courses.
A degree in computer science is not required for admission to the M.S. program. However, we do expect applicants to have background coursework in CS and Math. Below are the type of background courses that are typically required before proceeding with M.S.-level courses; however, the exact individual requirements will be worked out with a faculty advisor and will take into account student's academic and professional CS background:

MATH 111 - Calculus I
MATH 112 - Calculus II
MATH 211 - Linear Algebra
CSCI 141 - Computational Problem Solving
CSCI 241 - Data Structures
CSCI 243 - Discrete Structures of Computer Science
CSCI 301 - Software Development

CSCI 303 - Algorithms
CSCI 304 - Computer Organization

To achieve regular status as an M.S. student, accepted students must earn at least a B in each qualifying course taken.

Computer Science, M.S., Specialization in Computational Operations Research

Course Requirements

Students must complete 32 graduate credits, including one of the following:

- CSCI 698 - Simulation and Modeling Project in Computational Operations Research *3*
- CSCI 708 - Research Project in Computational Operations Research *2*
- CSCI 710 - Research Project *2*
- In addition, students must satisfactorily complete at least seven courses from the following list of courses in the computational operations research area.
- CSCI 608 - Decision Theory *3*
- CSCI 618 - Models and Applications in Operations Research *3*
- CSCI 628 - Linear Programming *3*
- CSCI 638 - Nonlinear Programming *3*
- CSCI 648 - Network Optimization *3*
- CSCI 658 - Discrete Optimization *3*
- CSCI 668 - Reliability *3*
- CSCI 678 - Statistical Analysis of Simulation Models *3*
- CSCI 688 - Topics in Computational Operations Research *3*
- CSCI 698 - Simulation and Modeling Project in Computational Operations Research
- CSCI 708 - Research Project in Computational Operations Research

The following Mathematics courses may count towards the 32 credit hours and do not require the graduate credit permission form for a course taken outside of their program of study.

MATH 524, MATH 551, MATH 552 and/or MATH 555.

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

William & Mary uses an online application system. Application materials consist of ~~GRE scores taken within the past five years,~~ transcripts~~,~~ and three letters of recommendation. ~~The general and computer science subject GRE scores are not required but may optionally be supplied. The absence of GRE scores will not negatively affect the application.~~ Applicants are encouraged (but not required) to submit results from a suitable subject area. If English is not your first language, your Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) scores are required and must be sent directly to William & Mary by the Educational Testing Service or IELTS.

HISTORY

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

William & Mary uses an online application system. Applicants must submit official transcripts, three letters of recommendation, and ~~GRE scores taken within the past five years.~~ a writing sample. Submission of GRE scores is optional.

DEGREE REQUIREMENTS:

History, M.A.

~~Research Portfolio Requirement~~

~~Students will prepare a research portfolio consisting of two major research papers.~~

Thesis Requirement

~~Students will prepare a research portfolio consisting of two major research papers approved by a committee.~~ In order to fulfill the thesis requirement, students will prepare a research portfolio consisting of two major research papers approved by a committee.

PHYSICS

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

William & Mary uses an online application system. Application materials consist ~~of GRE~~

~~scores taken within the past five years including both the GRE General Test and the GRE subject test (Physics), transcripts, and~~ transcripts and three letters of recommendation. The general and physics subject GRE scores are not required but may optionally be supplied. The absence of GRE scores will not negatively affect the application. Supplemental application questions are also required.

PSYCHOLOGICAL SCIENCES

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

William & Mary uses an online application system. Application materials consist ~~of GRE scores taken within the past five years,~~ official transcripts, a research statement, a curriculum vitae, and three letters of recommendation.

PUBLIC POLICY

The following changes were approved by COGS on May 4, 2023.

Admission Requirements

For full consideration for admission and financial assistance, applications and all supporting materials, including transcripts, and three letters of recommendation ~~and GRE scores taken within the past five years,~~ must be received by January 15. GRE scores are optional. Applications submitted after the program's deadline may be evaluated if space is available.

To be admitted to the program, a student must demonstrate potential for success through his or her undergraduate record~~, GRE scores~~ and letters of recommendation.

Graduate Arts & Sciences: Additional Graduate Courses

The following changes were approved by COGS on April 6, 2023.

COURSE ADDITIONS:

DATA 641 - Network Analysis

Spring (3) Nwala. Prerequisite(s): previous programming experience

Networks are everywhere in our lives: networks of friends on social media, the Web, networks of neurons in our brains, etc. It's amazing that such a simple representation - dots and lines - can capture a variety of relationships, whether simple or complex. In this course, we will survey a broad range of fundamental topics in network science, relevant to students from data/computer science and engineering, informatics, business, biology, physics, statistics, social sciences, etc. For example, we will explore the properties of social networks and the key role of hubs, and how directed and weighted networks affect the spread of information and misinformation in social media. These topics are important and useful in many job sectors from marketing to technology, management to design, and from biology to the arts and humanities. Cross-listed with DATA 541

DATA 643 - Reinforcement Learning

Fall (3) Chen. Prerequisite(s): Background in Python, Statistics, Linear Algebra, Calculus, and introductory concepts in Machine Learning.

This course introduces the fundamentals of reinforcement learning (RL) and its applications in various domains. The students will be able to (1) understand the theoretical foundations of RL problems, (2) know how to formalize a problem as a RL problem, (3) understand a spectrum of existing RL algorithms such as Q-learning and policy gradient, and (4) how to implement a RL algorithm to the target problem of interest. There will be several hands-on projects throughout the course. Programming will be done in the Python language. By the end of the course, the students should be able to implement classical RL algorithms such as Q-learning and policy gradient and apply the RL algorithms to solve example real-world problems.

DATA 670 - Photogrammetric & Spatial Data in Parallel Environments

(3)

This course aims to provide students with a comprehensive understanding of the core concepts, principles, and practices in photogrammetric and spatial data analysis. The course consists of two primary components. The first component will focus on theoretical readings in GIS, Remote Sensing, and Spatial Statistics, where students will explore the conceptual foundations of these fields and analyze their intersections. The second component will provide hands-on training in implementing spatial data analytics in High-Performance Computing (HPC) environments. Students will gain practical experience in developing, testing, and deploying large-scale spatial analysis applications in parallel computing architectures. By the end of the course, students will have a strong foundation in the key theoretical and practical aspects of photogrammetry and spatial data analysis. Cross-listed with DATA 570

DATA 690 - Readings in Data Science

(3) Runfola

Directed Readings in Data Science is designed to promote the study of subject matter beyond topics covered in regular course offerings. It is most appropriate for students who have already exhausted offerings in the area of study that interest them. Working closely with a faculty advisor, students will study, through readings and other mediums as may be appropriate, a Data Science related topic selected by the instructor. Students will be expected to illustrate their understanding of the material, as well as ability to synthesize and critically discuss key topics presented. Cross-listed with DATA 590

DATA 691 - Topics in Data Science

(3) Runfola

The course will cover a broad range of topics in Data Science, and the specific subject and text will be selected by the instructor. This course is intended to provide students with an in-depth

understanding of the latest trends and technologies in the field of Data Science. Throughout the course, students will be required to engage in independent research and critical analysis of the selected subject matter. The course will utilize various mediums including readings, case studies, and other resources as appropriate. Students will be expected to demonstrate their ability to synthesize and apply the knowledge gained from the course in practical applications. By the end of the course, students should have gained a deep understanding of the selected subject matter in Data Science and be able to apply the knowledge gained to both real-world scenarios and their own research. Cross-listed with DATA 591

The following changes were approved by COGS on May 4, 2023.

COURSE ADDITIONS:

DATA 644 - Bayesian Reasoning in Data Science

(3) Fanelli

No data scientist can work without a solid grasp of conditional probability and Bayesian reasoning. Bayes' theorem allows us to update our beliefs based on the occurrence of new events, steering the inference towards the truth and assessing uncertainty in predictions. This course offers an in-depth examination of Bayesian reasoning in data science, allowing you to grasp the fundamental components of this approach through practical examples spanning various domains. Throughout the course, you will acquire hands-on experience with concrete computational implementations, enabling students to bridge the gap between theoretical concepts and their programming applications, thereby solidifying their understanding of the material.

Graduate Center Annual Report

Staff and Facilities
The Graduate Center organizes and sponsors a variety of activities, events, and zero-credit courses for graduate and professional students in Arts & Sciences. Sarah Glosson, Director of the Arts & Sciences Graduate Center, administers the Center, which, for 2022-23, did not have a location.

In Fall 2022, Spring 2023 and Summer 2023, three W&M faculty and staff members taught ten Graduate Center courses. The Graduate Center continued to work collaboratively with other W&M offices and schools to offer a range of activities and events that enhance the graduate experience of A&S graduate students. This included taking over responsibility for the annual Graduate Research Symposium.

Graduate Center Highlights
Appendix I provides a listing and summary of participation in selected Graduate Center activities, events, and courses since Fall 2012.

- **GRAD Courses**: Total course enrollment for the calendar year was 58. The students enrolled were a mix of domestic and international graduate students. The English language courses continue to be successful. Increasingly, to better fit students' schedules and research demands, GRAD courses are offered as one-week "boot camps" rather than as 10-week courses and sometimes now include asynchronous components to help students fit the courses into their schedules.
- **3MT**: The 3MT returned, after pandemic hiatus, in March 2023, as a signature event of the Graduate & Honors Research Symposium. Eight graduate presenters competed for cash prizes. For the first time, the event included a showcase of undergraduate Honors researchers (4). A large audience of over 200 participated and enjoyed a reception after the conclusion of the competition and showcase.
- **Emerging Scholars Series:** In partnership with the Williamsburg Regional Library (WRL), the Graduate Center hosted five public talks open to the local community. These talks featured masters and doctoral students from history, anthropology, and chemistry, and reached a total audience of 155, a notable increase from the previous year. The WRL reports that these are some of their most well attended and popular talks.
- **Graduate Writing Resources Center**: The Graduate Center partners with the Writing Resources Center to offer graduate-level writing consultation at the Graduate Writing Resources Center (GWRC). In 2022-23, 3 graduate students from A&S and one from Education were hired and trained in peer writing consultation at the graduate level. The GWRC offered both online and in-person consultation to accommodate student needs.
- **Professional Development Workshops**: In partnership with individual graduate programs, W&M Libraries, the Cohen Career Center, the Wellness Center, and the Reves Center, the Graduate Center offered/supported nine workshops and panels on a variety of topics including Academic Writing, Career Conversations workshop series, CVs and Resumes, Teaching Statements and Diversity Statements, Website Creation, Science Writing Tips, Scholarly Publishing and Author's Rights, Applying for Fellowships, and more. Attendance across all workshops totaled roughly 120 attendees.
- **GSAB Mentoring Program**: The goal of this program is to foster one-on-one mentorships intended to help students build professional skills. In Spring 2018 we piloted this new program with volunteer mentors from the GSAB. In 2018-19 we expanded the pilot to include "friends and family" of the GSAB to serve as mentors. For 2022-23, six students signed up to participate. Five GSAB members and other alumni/friends of the university served as mentors.

- **Graduate & Honors Research Symposium**: After a pandemic hiatus, the Graduate Research Symposium returned, but with some updates. In collaboration with the Charles Center, the A&S Graduate Center lead the reimagining of the Symposium. Held March 30-31, 2023, the symposium featured 170 poster and panel presentations by graduate and honors students representing Arts & Sciences, as well as graduate students from other regional institutions.

Other Activities Sponsored by the Office of Graduate Studies and Research

- **Newsletter**: The Graduate Center's "Graduate A&S Newsletter" is distributed by email to A&S graduate students as well as faculty and staff affiliates every Monday during the academic year. Each academic year there are approximately thirty issues of the newsletter. Entries include links to events posted in the A&S Graduate Studies & Research Events Calendar, as well as to webpages containing pertinent information.

A&S Graduate Ombudsperson Report for August 2022 – June 2023

Peter Vishton, Associate Professor, Psychological Sciences

A total of 15 graduate students contacted the ombudsperson for consultation about a wide-range of issues including payroll, medical leaves, complaints about conduct, student-teacher conflicts, advisor-advisee relationships, work relationships, and allegations of psychological abuse and retaliation. The ombudsperson conducted two informational meetings with graduate students from two different departments.

In all cases, the ombudsperson helped by directing the graduate students to the appropriate entity within A&S or assisting in devising solutions that would serve the graduate students' best interests. The ombudsperson provided relevant information, acted as mediator, and proposed possible courses of action. For two cases, the ombudsperson contacted a Graduate Director, Department Chair, and/or Dean to confirm that proper procedures were being followed.

The time-scale of these incidents varied widely. The simplest matters were resolved in a single meeting. More complex matters required several weeks of meetings and discussions.

The ombudsperson participated in graduate A&S orientation events and the bi-weekly meetings of the Committee on Graduate Studies (COGS) throughout the academic year, with the goal of maintaining close contact with the graduate programs of Arts and Sciences.

All cases have been resolved.

Committee on Graduate Studies Members, 2022-23

Chris Carone, Chair
Jenny Kahn, American Studies
Neil Norman, Anthropology
Dan Runfola, Applied Science
Joshua Puzey Biology
Bill McNamara, Chemistry
Denys Poshyvanyk, Computer Science
Rex Kincaid, Computational Operations Research
Kathy Levitan, History
Mike Kordosky, Physics
Cheryl Dickter, Psychological Sciences
Elaine McBeth, Public Policy

Appendices

APPENDIX I

GRADUATE CENTER PARTICIPATION
Fall 2018 - Summer 2023

Course	F 2018	S 19	Summer 2019	F 19	S 20	Summer 20	F 20	S 21	Summer 21	F 21	S 22	Summer 22	F 22	S 23	Summer 23
GRAD 501	5			5			4			4			4		
GRAD 502								3			4			6	
GRAD 503	9			5	9		8			7			8		
GRAD 505		10			9			10			9			10	
GRAD 510	7	3		8			11	5	17	10	10		4		
GRAD 512	10		7	6											
GRAD 520		7		6				5			10			6	
GRAD 522	4			5			5								
GRAD 529			9			8		8				5			6
GRAD 530	8	8		9	9		8	8		8	7		5	5	
GRAD 540 001		6			3		6								
GRAD 540 002		8													
GRAD 560										10			4		
Course Subtotals	**43**	**42**	**16**	**44**	**30**	**8**	**42**	**39**	**17**	**39**	**40**	**5**	**25**	**27**	**6**

Workshops	F 2018	S 19	Summer 2019	F 19	S 20	Summer 20	F 20	S 21	Summer 21	F 21	S 22	Summer 22	F 22	S 23	Summer 23
Job Market for the Humanities							6	10	8					9	
Prep for Provost Disseration Fellowship Application	8			12			14			10			15		
CV for the Sciences							3								
Preparing for the Scientific Job Market					10			15							
Alt-Ac-Careers	6				5						7				
ETD/Copyright/Embargo	7		9												
Digital Identity Roundtable/Digital Scholarship									23		2	22	3		
Writing Skills for Sciences	4			24			21			21			21		
Bibliographies & Citations Made Easy	11			13									2		
Author's Rights & Publishing		7		2						6	1		3		
Elevator Pitch/public speaking (Symposium)		6												3	
Career Development Series (various topics)										5	4			9	
GWRC Workshop Series (various topics)										23	18		31		
3MT Presentation Workshop(s)	9			11										24	
Workshop Subtotals	**45**	**13**	**9**	**62**	**15**	**0**	**44**	**25**	**31**	**65**	**32**	**22**	**75**	**45**	**0**

Programs	F 2018	S 19	Summer 2019	F 19	S 20	Summer 20	F 20	S 21	Summer 21	F 21	S 22	Summer 22	F 22	S 23	Summer 23
Graduate Research Symposium		1000			*			*			*			600	
Raft Debate		650			*			*			*			**	
Program Subtotals	**0**	**1650**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**600**	**0**
GRAND TOTAL	88	1705	25	106	45	8	86	64	48	104	72	27	100	672	6

*due to COVID-19 the GRS and Raft Debate were postponed
**Raft Debate is on indefinte hold

APPENDIX II

APPLIED, ACCEPTED and ENROLLED *
Fall 2018 - Fall 2022

		Applied	Accepted		Enrolled		Avg UG[1]
			Total	Rate	Total	Rate	GPA
American Studies	2018	39	15	38%	7	47%	3.69
	2019	24	13	54%	6	46%	3.10
	2020	33	19	58%	9	47%	3.60
	2021	40	15	38%	8	53%	3.40
	2022	37	19	51%	9	47%	3.75
Anthropology	2018	37	11	30%	6	55%	3.73
	2019	47	11	23%	6	55%	3.40
	2020	33	7	21%	6	86%	3.80
	2021	50	10	20%	9	90%	3.50
	2022	23	7	30%	6	86%	3.83
Applied Science	2018	44	16	36%	10	63%	3.71
	2019	20	6	30%	4	67%	3.74
	2020	13	6	46%	6	100%	3.30
	2021	12	4	33%	3	75%	3.50
	2022	5	3	60%	3	100%	3.59
Biology	2018	40	12	30%	8	67%	3.85
	2019	56	17	30%	8	47%	3.60
	2020	44	8	18%	8	100%	3.60
	2021	129	10	8%	7	70%	3.50
	2022	45	9	20%	9	100%	3.53
Chemistry	2018	18	7	39%	5	71%	3.40
	2019	13	6	46%	6	100%	3.30
	2020	18	5	28%	5	100%	3.60
	2021	16	7	44%	5	71%	3.90
	2022	18	4	22%	4	100%	3.51
Computer Science [2]	2018	139	50	36%	17	34%	3.57
	2019	100	35	35%	22	88%	3.10
	2020	105	28	27%	24	86%	3.40
	2021	102	50	49%	28	56%	3.70
	2022	124	28	23%	25	89%	3.56
History	2018	103	28	27%	18	64%	3.70
	2019	96	17	18%	11	65%	3.60
	2020	97	29	30%	14	48%	3.30
	2021	86	30	35%	7	23%	3.70
	2022	107	20	19%	11	55%	3.90
Physics	2018	105	20	19%	7	35%	3.89
	2019	61	17	28%	8	47%	3.73
	2020	51	22	43%	8	36%	3.80
	2021	54	21	39%	9	43%	3.80
	2022	65	20	31%	12	60%	3.73
Psychological Sciences	2018	116	15	13%	9	60%	3.57
	2019	102	8	8%	7	88%	3.40
	2020	99	9	9%	8	89%	3.70
	2021	159	13	8%	8	62%	3.60
	2022	149	9	6%	9	100%	3.85
Public Policy[3]	2018	42	28	67%	10	36%	3.66
	2019	48	5	10%	4	80%	3.80
	2020	-	-	-	-	-	-
	2021	40	27	68%	9	33%	3.30
	2022	42	27	64%	9	33%	3.63

*Due to COVD-19 related difficulties in taking the GRE scores, Graduate Arts & Sciences suspended this requirement for applicants beginning in 2020. Submission was optional as additional information provided by applications. Not submitting GRE scores did not negatively impact consideration for admission.

[1] Average of UG transcripts submitted by enrolled students.

[2] This includes applicants to and students admitted to the Computational Operations Research master's program.

[3] For Fall 2020, Provost Agouris suspended admissions to the Master of Public Policy program.

APPENDIX III
GRADUATE STUDENT ENROLLMENTS[(1)]

Fall 2018 to Fall 2022

Department	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
American Studies	43	42	41	34	36
Anthropology	37	31	34	35	38
Applied Science	35	29	31	30	24
Biology	23	19	17	19	18
Chemistry	12	9	11	11	12
Computer Science[2]	85	79	82	83	88
History	48	48	42	45	51
Physics	56	51	50	52	54
Psychological Sciences	20	17	15	16	16
Public Policy	26	16	3	10	17
TOTALS	385	341	326	335	354

Notes:

[1] Totals include full-time, part-time and continuous enrollment registration, including combined degree students in Law, Business, and Education in 2022-2023.

[2] Includes Computational Operations Research.

APPENDIX IV
GRADUATE STUDENT ENROLLMENT BY DEGREE FALL 2022

Program	MA	MS	MA/PhD	MS/PhD	PhD	MPP	Total
American Studies	7		2		27		36
Anthropology	12		1		25		38
Applied Science		1			23		24
Biology		18					18
Chemistry		12					12
Computer Science		17		5	50		72
COR		16					16
History	11		5		35		51
Physics				12	42		54
Psychological Sciences		16					16
Public Policy (MPP)						17	17
	MA	**MS**	**MA/PhD**	**MS/PhD**	**PhD**	**MPP**	
Total Enrollment	**30**	**80**	**8**	**17**	**202**	**17**	**354**

APPENDIX V
GRADUATE DEGREES AWARDED DURING THE LAST 10 YEARS
(August 2013 – May 2023)

DEPARTMENT	PROGRAM INITIATED	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	SINCE AUG. 2013
American Studies	1982-MA	7	5	3	3	8	3	2	5	3	3	42
	1988-PhD	6	9	5	11	4	5	5	7	7	1	60
Anthropology	1979-MA	8	3	6	5	2	4	3	4	4	6	45
	2001-PhD	7	2	1	5	7	4	2	2	1	1	32
Applied Science	1970-MA/MS	6	2	2	0	2	7	1	1	0	2	23
	1990-PhD	4	6	2	5	5	3	9	2	4	9	49
Biology	1963-MA/MS	8	7	9	9	7	8	9	8	3	10	78
Chemistry	1964-MA/MS	6	8	4	4	7	7	4	3	5	6	54
Computer Science[1]	1984-MS	23	17	17	30	20	13	17	13	10	16	176
	1986-PhD	6	4	12	8	9	12	10	11	6	8	86
History	1955-MA	12	13	7	16	11	16	12	16	6	14	123
	1967-PhD	2	5	4	9	5	4	5	2	8	4	48
Physics	1959-MA/MS	13	5	7	18	12	6	10	6	10	6	93
	1964-PhD	5	7	9	16	16	14	4	6	11	7	95
Psychological Sciences	1953-MA	8	12	7	8	10	4	0	0	0	0	49
	2019-MS						2	5	12	10	7	36
Public Policy	1991-MPP	19	18	20	18	21	13	13	3	1	16	142
Totals	MA/MS/MPP	110	90	82	111	100	83	76	71	52	86	861
	PhD	30	33	33	54	46	42	35	30	37	30	370

[1] Includes Computational Operations Research.