Biodefense Graduate Program
Department of Public and International Affairs
George Mason University

Faculty and Student Handbook

For Biodefense MS and Ph.D. Students Admitted Fall 2013 or Later
TABLE OF CONTENTS

I. Program Overview
II. Admission to the Program
III. Program Administration
IV. Guidelines for the MS in Biodefense
V. Guidelines for PhD in Biodefense
VI. Guidelines for the Critical Analysis and Strategic Responses to Terrorism Certificate
VII. Tidbits

Appendix 1: Biodefense Core Courses and
Appendix II: Non-Biodefense Electives
Appendix III: Electives by Concentration
Appendix IV: Biodefense Faculty
I. Program Overview

The goal of the Biodefense Program is to educate the next generation of biodefense and biosecurity professionals and scholars. The program operates at the nexus of science and policy to provide students with the knowledge, skills, and training to assess the risks posed by natural and man-made biological threats, while teaching them to develop strategies for reducing these risks to national and international security. The Biodefense program seeks to train students for employment in all sectors, including work with the U.S. government, private corporations, and non-governmental organizations. The program provides students with a broad background in the science and technology of biodefense, while giving them the opportunity to specialize in the narrower fields of International Security, Terrorism and Homeland Security, or Technology and Weapons of Mass Destruction.

By combining a foundation in the biological sciences with a focus on policy analysis, the GMU Biodefense Program is the first of its kind in the United States to offer a broad program of study in the defense against all biological threats. The risks posed by these threats have steadily increased due to globalization, advances in science and technology, the changing nature of conflict, and a more nuanced definition of security. The dual-use nature of the biotechnology revolution and accelerating pace of innovation in the life sciences presents the world with both new opportunities and new dangers. The 2001 anthrax letter attacks highlighted the vulnerability of modern society to biological terrorism. The mounting toll of HIV/AIDS, the emergence of new infectious diseases such as SARS and highly pathogenic avian influenza, and the potential for an influenza pandemic reinforce the need for a comprehensive biosecurity strategy to address the risks posed by naturally occurring diseases at home and abroad. The globalization of science and technology, disease outbreaks, and terrorist activities underscores the need for an international response to these issues.

Preventing and responding to man-made and naturally occurring disease outbreaks requires interdisciplinary collaboration, interagency coordination, intergovernmental coalitions, public-private partnerships, and international cooperation. The Biodefense Program is designed to provide students with the knowledge and skills to bridge the gap between scientists and policymakers on each of these levels. These skills are also essential to combating terrorism, the proliferation of weapons of mass destruction, and other transnational threats.

Students can select one of three fields for their concentration: International Security, Terrorism and Homeland Security, or Technology and Weapons of Mass Destruction. These concentrations provide students with an in-depth understanding of the theory and practice of their chosen field. Due to the complexity and scope of biodefense and biosecurity, doctoral students are also required to take two courses in the field in which they are not concentrating.

Within the Department of Public and International Affairs, students can benefit from the extensive knowledge and experience of its well-renowned faculty whose areas of expertise range from CBRN weapons and terrorism to molecular and microbiology.

In addition to being able to take advantage of the array of courses within PIA, students in the Biodefense Program can also pursue courses in biology, bioinformatics, bioscience, health
sciences, and communication. George Mason is also home to the National Center for Biodefense and Infectious Diseases and is constructing an NIH-funded Biomedical Research Laboratory to develop techniques and products for the detection, diagnosis, prevention and treatment of infectious diseases resulting from natural outbreaks, intentionally released, or genetically engineered pathogens. George Mason is also part of the Consortium of Universities of the Washington Metropolitan Areas, enabling its students to take advantage of classes offered at universities like Johns Hopkins or Georgetown.

In addition to the MS and PhD degrees in biodefense, the department offers MA and PhD degrees in political science and a Master of Public Administration. The MPA program offers a concentration and certificate in emergency management and homeland security while our Biodefense program offers a graduate certificate in Critical Analysis and Strategic Responses to Terrorism.
II. Admission to the Biodefense Programs

The deadline for receipt of applications materials are as follows:

Critical Analysis and Strategic Responses to Terrorism— April 15 (fall); November 1 (spring)*
Masters—February 1 (fall)*
PhD—December 1 (fall)*

*The deadline for applicants with international credentials or applicants who seek financial assistance is one month prior to each deadline

Applicants to all programs require a bachelor’s degree from an accredited college or university for admission. Applicants who have completed a master’s degree still need to submit official transcripts of their bachelor’s degree.

Applicants must submit the following materials to the Department for admission considerations:

1. Completed online application
2. A non-refundable application fee
3. The Application for Virginia In-State Tuition Rates, if applicants are Virginia residents
4. Official transcript from each undergraduate and graduate program attended
5. Three letters of recommendation from faculty members or those who can evaluate the applicant’s academic potential (ie supervisors, professional references)
6. A statement of purpose: In a statement not to exceed 500 words, please state your purpose in undertaking graduate study with this program. This statement should address your intellectual interests, academic objectives, career goals, and proposed topic(s) of graduate study. You should also explain how this program will help you fulfill your academic and professional objectives. The statement is a critical component of the application.
7. Graduate Record Exam scores
8. Test of English as a Foreign Language (TOEFL) for international applicants
9. Resume or Curriculum Vitae
10. Writing sample such as a full length research paper (for applicants to PhD program only).
III. Program Administration

The program will be administered by the Biodefense Program Director, faculty, and office. The Program Director takes the lead in proposing policy changes, and in chairing and appointing curriculum and admissions committees, organizing qualifying examinations, and making recommendations on Thesis and Dissertation committee membership to the Chair. The Graduate Coordinator administers the program procedures, including responding to information requests, communicating information about requirements and changes in status to students, and tracking application and graduation forms. The Admissions and Awards Committee, chaired by the Program Director or Deputy Director, will make determinations regarding admissions and the awarding of fellowships.

Academic Advising
Every incoming student will be assigned a faculty member to serve as an academic advisor. Advisors will work closely with students in their first semester to design an Education Plan that will guide their course choices throughout the program.

Students must have a Program of Study based on this plan approved by their advisor and the program director at least one semester before they anticipate completing their coursework. The Program of Study form is then submitted to the Graduate Coordinator. This form states what courses students are taking or have taken to fulfill their degree and concentration requirements and is used to verify that students have taken the proper courses and the correct number of credit hours. The number of credits for Project, Thesis, or Dissertation is determined in concert with the student’s Project Director, Thesis Director or Dissertation Chair, as appropriate. Progress in an approved program of study is the shared responsibility of the student and the advisor. The graduate student is responsible for compliance with the policies and procedures of the college and all applicable departmental requirements that govern the individual program of study.

Internships
George Mason is located in the DC Metropolitan area, and students are therefore strongly encouraged to take advantage of the wealth of internship opportunities available. Students that have earned 12+ credits may receive academic credit for a qualified internship related to their coursework or biodefense degree. Internship positions may be secured at every level of government, in non-profit professional organizations, or in private firms. Students in the CASR and MS programs register for BIOD 780 while students in the PhD program register for BIOD 890. In order to receive academic credit, an internship must have the approval of the internship coordinator, Dr. Ann Ludwick (aludwick@gmu.edu). The internship cannot be a current job or internship and must start at the beginning of the semester in which the student will be enrolled in the internship course. Grading for the internship course is Pass/Fail. Those that pass the course will receive credit and those that do not pass will not receive credit. These credits do not factor into the student GPA. Details on registering for these courses, as well as internship listings, can be found at http://pia.gmu.edu/internship/internships.
IV. Guidelines for the MS in Biodefense

**MS in Biodefense**
This degree requires the completion of 36 credits, and offers specializations in International Security, Terrorism and Homeland Security, or Technology and Weapons of Mass Destruction. Students must take the six core courses below, followed by three to five courses in their selected field of specialization, and the capstone course.

1) **Six core courses (18 credits)**
   - BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents Credits: 3
   - BIOD 605 - Introduction to Biodefense II: Viral Agents Credits: 3
   - BIOD 609 - Biodefense Strategy and Policy Credits: 3
   - GOVT 500 - The Scientific Method and Research Design Credits: 3
   - GOVT 540 - International Relations Credits: 3
   - PUAD 637 - Managing Homeland Security Credits: 3

2) **Three to five courses in one field of specialization (9 to 15 credits)**
   - **Specialization I: International Security**
     - Two required field seminars (6 credits)
       - GOVT 744 - Foundations of Security Studies Credits: 3
       - GOVT 745 - International Security Credits: 3
     - One to three elective courses (3 to 9 credits) chosen from:
       - BIOD 621 - Ethics and International Security Credits: 3
       - BIOD 622 - Negotiating in the International Arena Credits: 3
       - BIOD 705 - Intelligence: Theory and Practice Credits: 3
       - BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
       - BIOD 709 - Nonproliferation and Arms Control Credits: 3
       - BIOD 722 - Examining Terrorist Groups Credits: 3
       - BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
       - BIOD 760 - National Security Technology and Policy Credits: 3
       - GOVT 640 - Strategic Responses to Terrorism: Coordinated Decision Making Credits: 3
       - GOVT 641 - Global Governance Credits: 3
       - GOVT 741 - Advanced Seminar in International Politics Credits: 3
       - GOVT 843 - Diplomacy Credits: 3
       - Other courses as approved by graduate director

   - **Specialization II: Terrorism and Homeland Security**
     - Two required field seminars (6 credits)
       - BIOD 722 - Examining Terrorist Groups Credits: 3
       - BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
     - One to three elective courses (3 to 9 credits) chosen from:
       - BIOD 621 - Ethics and International Security Credits: 3
       - BIOD 622 - Negotiating in the International Arena Credits: 3
       - BIOD 705 - Intelligence: Theory and Practice Credits: 3
- **BIOD 706** - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
- **BIOD 709** - Nonproliferation and Arms Control Credits: 3
- **BIOD 760** - National Security Technology and Policy Credits: 3
- **GOVT 744** - Foundations of Security Studies Credits: 3
- **GOVT 640** - Strategic Responses to Terrorism: Coordinated Decision Making Credits: 3
- **GOVT 641** - Global Governance Credits: 3
- **GOVT 741** - Advanced Seminar in International Politics Credits: 3
- **GOVT 745** - International Security Credits: 3
- **GOVT 843** - Diplomacy Credits: 3
- Other courses as approved by graduate director

**Specialization III: Technology and Weapons of Mass Destruction**
- Two required field seminars (6 credits)
  - **BIOD 706** - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
  - **BIOD 760** - National Security Technology and Policy Credits: 3
- One to three elective courses (3 to 9 credits) chosen from:
  - **BIOD 621** - Ethics and International Security Credits: 3
  - **BIOD 622** - Negotiating in the International Arena Credits: 3
  - **BIOD 705** - Intelligence: Theory and Practice Credits: 3
  - **BIOD 706** - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
  - **BIOD 709** - Nonproliferation and Arms Control Credits: 3
  - **BIOD 722** - Examining Terrorist Groups Credits: 3
  - **BIOD 725** - Terrorism and Weapons of Mass Destruction Credits: 3
  - **GOVT 640** - Strategic Responses to Terrorism: Coordinated Decision Making Credits: 3
  - **GOVT 641** - Global Governance Credits: 3
  - **GOVT 741** - Advanced Seminar in International Politics Credits: 3
  - **GOVT 744** - Foundations of Security Studies Credits: 3
  - **GOVT 745** - International Security Credits: 3
  - **GOVT 843** - Diplomacy Credits: 3
  - Other courses as approved by graduate director
- Up to two elective courses (0 to 6 credits)

The number of electives students have will depend on how many credits they took in the field of specialization. Students choose the remaining credits required for the degree from other courses in the department including an internship or additional courses in the field of specialization. Up to six credits may be from other disciplines with prior written approval of the graduate advisor.

**4) Capstone Course (3 credits)**
- **BIOD 790** – Biodefense Capstone Credits: 3
Students must demonstrate the ability to conduct original, independent research by completing a research project in BIOD 790, Biodefense Capstone. The course requires the student to produce a
substantial and original contribution to the fields of biodefense or biosecurity on the model of a paper suitable for presentation at a scholarly conference or an article in a peer-reviewed scholarly journal. The objective of the research project is to serve as a capstone for the student’s graduate education and to demonstrate the student’s research, analytical and writing skills.

**Total: 36 credits**

**Preparing for Graduation**
Master’s degree students have six years from the time of first enrollment as a degree-seeking student to complete their degrees. Students who are given permission to re-enroll following an absence from Mason may not count the six-year time limit as beginning on the date of re-enrollment.

Students must file their Intent to Graduate with the registrar’s office the semester BEFORE they plan to graduate. Please consult the following website for further information on graduation timelines: [http://registrar.gmu.edu/gif/](http://registrar.gmu.edu/gif/)
V. Guidelines for the PhD in Biodefense

In addition to meeting the following requirements for this degree, students must meet the university requirements for all master's degrees.

To receive a PhD in biodefense, students must complete a minimum of 72 credits. Students are strongly encouraged to take the core courses as early as possible because they provide the foundation for the rest of the program. The courses that students plan on taking should be approved in a program of study designed by the student and their advisor during the student’s first semester. Students may take up to 12 credits of courses outside of the Biodefense Program with prior written approval of their advisor. Consult with the graduate program director or coordinator for a list of BIOD electives and approved non-BIOD electives that can be used to fulfill some of the requirements below.

Doctoral Course Work (48-60 credits)

1) Seven core courses (21 credits)
   - BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents Credits: 3
   - BIOD 605 - Introduction to Biodefense II: Viral Agents Credits: 3
   - BIOD 609 - Biodefense Strategy and Policy Credits: 3
   - GOVT 500 - The Scientific Method and Research Design Credits: 3
   - GOVT 540 - International Relations Credits: 3
   - PUAD 637 - Managing Homeland Security Credits: 3
   - One additional advanced research course (3 credits) chosen from GOVT 712, GOVT 7171, PUAD 646, or an alternative research course approved by the program director.

2) Four courses (12 credits) in one field of specialization
   a) Specialization I: International Security
      - Two required field seminars (6 credits)
        - GOVT 744 - Foundations of Security Studies Credits: 3
        - GOVT 745 - International Security Credits: 3
      - Two elective courses (6 credits)
   b) Specialization II: Terrorism and Homeland Security
      - Two required field seminars (6 credits)
        - BIOD 722 - Examining Terrorist Groups Credits: 3
        - BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
      - Two elective courses (6 credits)
   c) Specialization III: Technology and Weapons of Mass Destruction
      - Two required seminars (6 credits)
        - BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
        - BIOD 760 - National Security Technology and Policy Credits: 3
      - Two elective courses (6 credits)
3) Two courses (6 credits)
Of the courses listed for the fields of specialization above, students must select two courses from those that are not in their chosen field.

4) Electives (9 to 21 credits)
Students complete the remaining credits through additional elective courses chosen in consultation with an advisor. These courses may be in the department of may be offered by other departments.

5) Qualifying Exam
The purpose of the qualifying exam is to determine if the student is ready to engage in dissertation research. Doctoral students are eligible to take the exam at the conclusion of coursework, provided an approved Degree Plan is on file in the department. The exam must be completed before the student takes dissertation proposal (BIOD 998).

The graduate office, with at least two if not three months advance notice, will announce the dates for the next cycle of qualifying exams. Each PhD student must take the written exam in three categories; science, policy, and student’s field of specialization. Therefore, the office publishes two (2) days/dates, usually one week apart. The categories of science and policy will be on one date and the exam on the student’s field of specialization will be given on a separate date.

Both exam days are made up of an 8-hour session, in a university room designated by the graduate office and supervised by graduate office staff. A laptop computer is provided. NO NOTES, NO BOOKS, NO READING LISTS ARE ALLOWED.

Exams are graded by a committee appointed by the Graduate Director. The possible grades for each question and for the exam overall are FAIL, PASS and HIGH PASS. (There is not a grade of LOW PASS.)

All three categories of the exam must achieve a PASS or higher for a grade of PASS for the overall exam. Any question that is failed must be re-taken at a subsequent exam cycle (in the same category with new questions). Any category area that is failed may be re-taken no more than one time. Failing a question category twice means that the overall exam is failed, and that the student is failed from the program.

6) Advancement to Candidacy
To advance to candidacy, a doctoral student must complete all coursework, degree requirements and pass the Qualifying Examination. An approved Degree Plan form, copy of the Reduction of Credit form (if applicable), and the Advancement to Candidacy form must be submitted to the Graduate Coordinator. The forms will then be sent to the dean’s office for approval. The University Catalog describes the requirements for doctoral degrees.

7) Dissertation Research (12-24 credits)
   o BIOD 998 - Doctoral Dissertation Proposal Credits: 3-6 credits
   o BIOD 999 - Doctoral Dissertation Credits: 9-12 (minimum of 9 credits)
Total: 72 credits

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies section of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 9 and a maximum of 18 credits of 999. They may apply a maximum of 24 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses. Please Note: additional credits beyond the 6 credit maximum for BIOD 998 will NOT apply to the degree.

Before registering in BIOD 999, students must offer a successful public defense of the dissertation proposal. Students must present the results of the dissertation research to their dissertation committee in a seminar and defend their dissertation to the university community. Successful completion of a dissertation is contingent on approval of the dissertation committee and the dean.

Dissertation Committee
Passing the qualifying exam will allow the student to advance into candidacy for the Ph.D. The qualifying exam must be completed before the student takes BIOD 998: Dissertation Proposal or BIOD 999: Dissertation Research. After passing the exam, the student must choose a dissertation committee. A Committee Approval form must be submitted to the Graduate Coordinator. The form can be found in the PhD student section of biodefense.gmu.edu. The Program Director approves the committee and forwards it to the Chair and Dean for approval.

All dissertation committees must consist of at least three members of the graduate faculty, at least two of whom must be from the student’s academic unit or program faculty. The committee consists of a dissertation chair, typically a graduate faculty member from the department or program of the student’s field of study and at least two other members of the graduate faculty. Only a graduate faculty member with a full-time appointment at George Mason University may serve as dissertation chair. Other Mason faculty, as well as individuals from outside the university, may be appointed as additional members to the committee. Such appointments are made where the additional member’s expertise and contribution add value to the dissertation, but appointment does not require graduate faculty status.

Student-initiated changes in the composition of the dissertation committee may occur only with the approval of the dean or director of the school, college, or institute or its designee in consultation with the committee. Faculty may resign from a dissertation committee with appropriate notice by submitting a written resignation.

The dissertation is a professional product that not only represents the student’s level of achievement, but also the scholarship generated by the program, department, the college, and George Mason University. The dissertation is a written piece of original thinking and research that demonstrates doctoral candidates’ mastery of the subject matter, methodologies, and
conceptual foundations in their chosen field of study. This is generally achieved through consideration of a problem on the boundaries of knowledge in the discipline. The dissertation committee works to ensure the doctoral candidate’s project demonstrates original research that contributes new knowledge and/or a reinterpretation of existing knowledge to the area of investigation.

**Dissertation Chair**

Chairs serve as the major advisor and mentor to the doctoral candidates as they research and write their dissertation. Some expectations of the chair are:

For the Proposal:
- Consult and meet with the student on a regular basis
- Advise on topic selection (e.g., appropriateness, academic value)
- Guide the student in the proposal writing process (e.g., understanding the need for a clearly defined problem statement, precise research questions, viable methodology, focused literature review, and thorough bibliography)
- Counsel student on reliability and validity of data-gathering methods
- Ensure that all research activities will be reviewed by the Human Subjects Review Board prior to implementation of the research activities. George Mason University requires that all research activities involving human subjects or data regarding human subjects that are directed by a GMU faculty member, staff member or student (including thesis and dissertation work) or involve GMU faculty, staff or students as participants, must be submitted to the Office of Sponsored Programs (OSP) for review and approval. Refer to oria.gmu.edu
- The Dissertation Chair will serve as the principal investigator for the research and assumes responsibility for the legal and ethical conduct of the work.
- Facilitate committee discussions about creating and improving the proposal

For the Dissertation:
- Meet with student on a regular basis to provide guidance and evaluation during the research and writing stages
- Review dissertation drafts in a timely manner
- Offer recommendations for revisions
- Communicate with committee members
- Discuss any problematic issues in the dissertation with the committee, student, and program director
- Approve the final draft for the dissertation defense, with the concurrence of the committee members
- Attend and supervise the dissertation defense
- Attend the graduation convocation to hood the candidate

**Dissertation Committee Members**
The dissertation committee works with the chair to provide advice and consultation to the candidate throughout the process of research and writing. Some expectations of the committee members are:

**For the Proposal**
- Meet with the student
- Advise on topic selection (e.g., appropriateness, academic value)
- Offer expertise in the member’s area of study
- Read and review the proposal in a timely manner
- Discuss any recommendations for revisions with the committee chair and student

**For the Dissertation:**
- Meet with the student to provide guidance and evaluation during the research and writing stages
- Review dissertation drafts in a timely manner
- Offer recommendations for revisions
- Discuss any problematic issues in the dissertation with the committee chair and student
- Approve the final draft for the dissertation defense, in consultation with the other committee members
- Members of the dissertation committee are expected to be present in person at the dissertation defense. At most, one member of the committee may be absent from a defense, and this should occur only in unusual circumstances that are unpredictable and cannot be avoided (e.g., sudden illness).

**Dissertation Proposal**
Students should have their dissertation committee approved before registering for BIOD 998, Dissertation Proposal. The student submits the Committee Approval Form to the Graduate Coordinator. The Graduate Coordinator will then give the student a CRN# so that the student can register. The CRN # for BIOD 998 will be different each semester. The student should request this CRN# from the Graduate Coordinator no later than 2 weeks before the start of classes for the semester.

The dissertation committee will evaluate the dissertation proposal for originality, feasibility, comprehensiveness, and the likelihood that it will make a scholarly contribution to the field. Students may register for 3-6 credits of BIOD 998. **Once enrolled in BIOD 998, students must maintain continuous registration in BIOD 998 each semester until graduation, excluding summers.** Students who defend their proposal in the summer must be registered for at least 1 credit of BIOD 998 in the summer. **The student must offer a successful public defense of the dissertation proposal and have the approval of his or her dissertation committee before registering for BIOD 999, Dissertation Research.** BIOD 999 registration is handled through the CHSS Dean’s Office-Grad Academic Affairs. **A Dissertation Proposal Approval form must be submitted to the Graduate Coordinator for approval by the Program Director, Chair, and Dean.**

**Dissertation Research**
The student must pass BIOD 998 to be able to register for BIOD 999: Dissertation Research.
The dissertation itself will be assessed using the same rigorous criteria as applied to the dissertation proposal. Only research projects that make an original and positive contribution to the fundamental understanding of biodefense and biosecurity will be deemed to satisfy the dissertation requirement for the doctorate.

Students working on dissertation research must register for a minimum of 3 credits of BIOD 999 per semester (excluding summers) until they have completed the minimum number of credits of 999 required by their degree program. Then, they must register for 1 credit of BIOD 999 per semester until the dissertation is complete. See the “Full Time Status of Graduate Students” section of the University Catalog for more information. Please know that it is a University requirement that students in BIOD 999 are continuously enrolled. Failure to not be enrolled for a spring or fall semester may result in dismissal from the program.

Registration for dissertation proposal (998) or research (999) must be completed by the end of the schedule adjustment period as published in the Schedule of Classes. If this date is missed, students must register for these courses the following semester. Failing to register on time in a particular semester does not alter the requirement for continuous registration for 999.

Policies and procedures for the submission of the dissertation can be found at http://thesis.gmu.edu/. It is critical that the PhD student fulfill the requirements found at http://thesis.gmu.edu prior to defending the dissertation.

Dissertation Defense
As soon as all degree requirements have been satisfied, including completion of the doctoral dissertation, the doctoral candidate may request a doctoral defense. Approval for the defense is given by the doctoral dissertation committee; Department Chair; and Dean. Notice of a defense must be given to the Graduate Coordinator no less than 3 weeks prior to the defense date. The public defense should demonstrate the candidate’s maturity of judgment and intellectual command of the chosen branches of the field of study.

Policies and procedures for the submission of the dissertation can be found at http://thesis.gmu.edu/. It is critical that the PhD student fulfill the requirements found at http://thesis.gmu.edu prior to defending the dissertation.

At the close of the defense, the dissertation committee makes final judgments for approving the dissertation. The doctoral candidate is responsible for making all required changes promptly, submitting the original and required copies, and obtaining signatures. Final approval for the dissertation is given by the doctoral dissertation committee; Department Chair; and Dean, all of whom must sign the final copy.

For a dissertation to be approved, all members of the committee must sign. If a committee member refuses to do so, the student or any member of the committee may petition the Dean. The Dean may seek the advice of outside reviewers to provide assessment of the work. The final decision is that of the Dean and is not subject to appeal.

The student must defend the dissertation within 11 years of beginning the program, and 6 years of advancing to candidacy. Students must file their Intent to Graduate with the registrar’s office.
the semester BEFORE they plan on graduating. Please consult the following website for further

University rules on the appointment of dissertation committees, time requirements, and
presenting and formatting for the dissertation can be found in the University Catalog.

**Reduction in Credit**
Students entering the PhD program with a graduate degree from George Mason or another
university may be able to apply up to 30 credits toward the PhD requirements. Students should
meet with Peg Koback, the Graduate Coordinator, to discuss any reduction of credit. The number
of credits that will be accepted will be approved by the Director of the Biodefense Program.
Students and their advisor will make a recommendation to the director as to how many credits
should be accepted and toward which requirements they will be counted. Advisors should
consider both the subject and quality of the course requirements and the quality of the student
performance in the course in making decisions about prior work. Students must provide their
advisor with catalog copy and syllabi for the courses they wish to have considered for prior
credit. An original transcript from the school that the credits were earned must be provided
(unless master’s was earned at Mason). At minimum, the last 42 of the 72 hours for the PhD
must be earned in the program. Decisions by the advisor and the Admissions Committee
regarding prior credit are sent to the Dean and Registrar for final approval on the Registrar’s
Reduction of Credit form, a copy of which should be kept for the student in his or her file. **This
should be done in the first semester to ensure that students can make appropriate course
choices.** University standards for prior course credits are described in the University Catalog.

**Degree Plan**
PhD students are strongly encouraged to periodically submit their Degree Plan form to both their
advisor and the Graduate Coordinator for review. The review is to ensure that the individual is
adhering to the requirements of the program. The Degree Plan states what courses the student is
taking or has taken to fulfill his or her degree and concentration requirements. In addition, if a
Reduction of Credits is to be applied, those credits should be included on the Degree Plan form.
Degree Plan forms are available from the Graduate Coordinator and are also available in the PhD
student section of biodefense.gmu.edu. Any changes in the degree plan must be documented
with an amended Degree Plan form signed by the student’s advisor.

It is the student’s responsibility to be aware of the requirements of the PhD program and to
adhere to those requirements.

---

**VI. Guidelines for the Critical Analysis and Strategic Responses to Terrorism Certificate**

**Selecting Electives**
Electives for your certificate will be selected in consultation with your assigned advisor. You must turn in your approved CASR Degree Plan to the Amanda Myers or Peg Koback in the Graduate Office (Robinson Hall A253) to receive credit for the electives you plan to take. Electives that have not been approved by your advisor will *not* count towards the certificate.

**Declaring Certificate as a Secondary Program**
Students may be enrolled in one graduate certificate program while they pursue a master’s or doctoral degree. To add the CASR certificate to your record, students must submit a Secondary Program Application to Amanda Myers or Peg Koback in the Graduate Office (Robinson Hall A253). Supplemental application materials (ie as goals statements, GREs, and transcripts) will be waived.

**Transferring Certificate Credits to MS or PhD**
Students who have completed the CASR graduate certificate may subsequently be approved to apply the credit hours for the certificate to the MS or PhD as long as the courses for the certificate were taken within six years of official enrollment into the MS or PhD degree program. All 15 credits will transfer into either biodefense degree.

**Preparing for Graduation**
The time limit for completion is six years from the date of admission to the graduate certificate program. International students attending in F-1 or J-1 status have more restrictive time limits; contact the Office of International Programs and Services for information. The time limit is not extended because of an absence and subsequent re-enrollment into the graduate certificate program. Failure to meet the time limit or to secure an extension request may result in termination from the program. For detailed information regarding graduation policies and procedures, please see the flowchart at the end of the handbook or visit registrar.gmu.edu.

---

**VII. Tidbits**
The Biodefense Program has a strong internet presence, and all students are encouraged to connect and engage with the program online.

**The Pandora Report:** The blog is a compendium of all that the program does – on it you’ll find everything from analysis of current biodefense-related world news to copies of the most recent student publications. With content updated daily and the weekly Pandora Report, we encourage you to check it out and contribute!

**Social Media**

**Mason Biodefense Twitter:** Follow us to keep up on all the most relevant biodefense, public health, and international security news.

**Mason Biodefense LinkedIn:** The LinkedIn group is 947 members and counting! With members range from current students to professionals well-established in the field, we strongly encourage you to join and start interacting.

**Mason Biodefense Facebook Page:** We post everything from department news to job and internship opportunities. Like us and never miss another zombie apocalypse article again.

---

**APPENDIX 1: GRADUATE BIODEFENSE COURSES**

**CORE COURSES**

**BIOD 604: Introduction to Biodefense I: Bacterial and Toxin Agents (3:3:0)**

Required course covering the microbiology, pathogenesis, metabolism, and clinical effects of bacterial and toxin agents that pose global public health threats or can be utilized as biological weapons.

**BIOD 605: Introduction to Biodefense II: Viral Agents (3:3:0)**

Required course covering the microbiology, pathogenesis, and clinical effects of viral agents that pose global public health threats or can be utilized as biological weapons.

**BIOD 609: Biodefense Strategy and Policy (3:3:0)**

Introduces students to the biodefense and biosecurity strategies and policies of the United States, other nations, and international organizations. Evaluates the effectiveness of these
policies in strengthening defenses, improving intelligence, increasing oversight, enhancing nonproliferation, and reinforcing norms. Examines the interaction of biodefense and biosecurity with homeland, national, and international security.

**GOVT 500: Research Methods in Political Science (3:3:0)**
Introduces research methods and data sources to study political science and practice of government. Topics include measurement of political concepts, research design, archival research techniques, survey research and case study development, and data analysis with elementary statistics.

**GOVT 540: International Politics (3:3:0)**
Focuses on changing structure of international politics, post cold war security issues, effect of globalized economy and information technology revolution, enhanced role of global corporations and nongovernmental organizations, and rise of nonsecurity issues in emerging international agenda.

**PUAD 630: All Hazard Planning and Preparedness (3:3:0)**
Provides an understanding of the issues associated in developing and implementing plans and policies to prepare for and respond to natural and man-made disasters. This course will use an all-hazards framework with special attention to the risks and challenges posed by nuclear, biological, chemical and radiological threats. Will address the role of interagency coordination, intergovernmental cooperation, and public-private partnerships in crisis and consequence management.

**APPENDIX II: ELECTIVE COURSES**

**BIOD 610: Advanced Topics in Biodefense (1-4:1-3:0-6)**
Different topics, depending on instructor’s specialty. Topics include legal, ethical, scientific, and political aspects of biodefense, emphasizing current problems and research. May be repeated when topic is different.

**BIOD 610: Intelligence and Weapons of Mass Destruction (3:3:0)**
Examines the challenges posed by collecting and analyzing intelligence on nuclear, biological, and chemical weapon programs conducted by states and terrorist groups.

**BIOD 620/GOVT 739: Health and Security (3:3:0)**
Explores issues emerging from the interaction of health and security that represent novel challenges to policy makers confronting a rapidly changing security landscape. Presents the major lines of discourse in the academic literature examining linkages between health and security. The impact of the AIDS epidemic on national and regional security, the role of health issues in post-Cold War conflict situations, and the security implications of advances in the life sciences.

**BIOD 621/GOVT 741: Ethics and International Security (3:3:0)**
Challenges students to wrestle with dilemmas raised by the desire to behave ethically in an international system in which consensus about ethical matters is absent. Students will develop, apply, and justify their own perspective on an ethical problem related to international security using ethical theory and social science research. Ethical issues related to nuclear, biological, and chemical weapons that confront researchers, policy-makers, and practitioners will be addressed.

BIOD 622/GOVT 739: Negotiating in the International Arena (3:3:0)
Provides students with the concepts and tools for analyzing complex negotiation processes and introduces them to the challenges facing international negotiators. Students will read about the frameworks and perspectives that have guided the scholarly research on negotiation as well as the latest findings from that research, analyze complex cases of actual negotiations in the security, trade, and environmental areas, and negotiate key issues on the agendas of nations and international organizations.

BIOD 705/GOVT 741: Intelligence: Theory and Practice (3:3:0)
Provides students with an understanding of the theory and practice of intelligence, including the intelligence cycle, organization of the intelligence community, and the origins and impact of recent reforms. Examines the capabilities and limitations of the different collection disciplines, analytic methodologies and pathologies, and the relationship between intelligence and policy. Analyzes the challenges posed by collecting and analyzing intelligence on weapons of mass destruction programs conducted by states and terrorists.

BIOD 706/GOVT 741: Nuclear, Biological, and Chemical Weapons Policy and Security (3:3:0)
Explores the causes, conduct and consequences of the proliferation of nuclear, biological, and chemical weapons. Will provide students with an understanding of the historical, technological, normative and strategic factors that have promoted and restrained the spread of these weapons. Will address the motives for states to develop these weapons and the debate over the security implications of nuclear, biological, and chemical weapon proliferation.

BIOD 709/GOVT 741: Nonproliferation and Arms Control (3:3:0)
Examines the array of national and international measures utilized to slow, halt, and reverse the spread of nuclear, biological, chemical, and missile weapons. The theory and practice of proliferation will be explored to provide insights into the supply and demand aspects of proliferation.

BIOD 710: Approaches to Bioweapon Medical Treatment and Response (3:3:0)
Examines research, treatment, and preparedness strategies against natural and man-made biological threats. Focuses on various strategies including immunological, pharmaceutical, and medical treatment methodologies and designs.

BIOD 722/PUAD 632/GOVT 739: Examining Terrorist Groups (3:3:0)
Introduces students to the subject of terrorism including the history and evolution of terrorism, case studies of key terrorist groups, the current nature of the terrorist threat, and counterterrorism strategies.
BIOD 723/PUAD 738: Legal Dimensions of Homeland Security (3:3:0)
Introduces students to the impact of legal issues on homeland security and biodefense. Topics to be addressed include the origins of the Department of Homeland Security, the relationship between public health and law enforcement, the role of the military in homeland security, trade-offs between privacy and security, legal aspects of public-private cooperation in biodefense and homeland security, quarantine authority and enforcement, ensuring compliance with international treaties, and implementing biosecurity regulations.

BIOD 725/GOVT 739: Terrorism and Weapons of Mass Destruction (3:3:0)
Examines the capabilities and intentions of terrorists to acquire and use chemical, biological, radiological and nuclear (CBRN) weapons. The course provides an in-depth understanding of the history of CBRN terrorism, the current challenges posed by this threat, and the range of national and international policy tools available to address this threat.

BIOD 726: Agroterrorism and Food Security (3:3:0)
Analyzes the threat of agricultural terrorism, including assessments of the chemical and biological agents that can be used to disrupt agriculture and livestock and the national and global economic and social impacts of these disruptions. The course will also examine strategies for enhancing the security of the food production and supply systems.

BIOD 751: Biosurveillance (3:3:0)
Provides students with an understanding of the capabilities required to provide reliable early warning of disease outbreaks and identify their etiological agents. The strengths and limitations of physicians, laboratories, epidemiologists, aerosol sensors, and syndromic surveillance systems will be assessed. The challenges posed by the integration and analysis of the information collected by these sources will also be considered.

BIOD 752/PUAD 738: The Role of the Military in Homeland Security (3:3:0)
Analyzes the role that the armed forces can play in homeland security, including historical and legal developments, the role of the National Guard, capabilities for crisis and consequence management, and case studies of military assistance to civilian authorities in response to riots, terrorist incidents, and natural disasters.

BIOD 760/GOVT 741: National Security Technology and Policy (3:3:0)
Introduces students to the intersection of science, technology, and policy in national security. Will examine the players in the formation of science policy, the roles they play, how the types, uncertainties and availability of data affect science policy debates, and how science policy decisions are made. Topics to be covered include weapons of mass destruction, non-lethal weapons, nanotechnology, bioengineering, energy security, and pandemic influenza.

BIOD 761: Dispersal Patterns of Biological Agents (3:3:0)
Prerequisites: BIOD 604 and 605, or permission of instructor. Introduction to military and terrorist methods of dispersal patterns. Covers physics of aerosols; engineering and mechanics of building ventilation systems; and mechanical dissemination, including hand-held, automatic, vehicle, and truck-mounted systems. Includes viability of specific agents involved.
BIOD 766: Development of Vaccines and Therapeutics (3:3:0)
Analyze the process of developing new medical countermeasures against biological weapons and emerging infectious diseases such as SARS and pandemic influenza. Special attention will be paid to the scientific, technical, political, regulatory and economic obstacles to developing new vaccines and therapeutics. The causes, and potential solutions, of public and private sector failures will be examined.

BIOD 767: Biotechnology and Biodefense (3:3:0-6)
Introduces students to the technologies underlying biological weapons and biodefense, including genetic engineering, genome sequencing, DNA synthesis, vaccines and therapeutics, and biocounterpart systems. The economic, environmental, ethical, legal, and security implications of biotechnology will also be addressed.

BIOD 810: Advanced Seminar in Biodefense (3:3:0)
Explores issues of contemporary and emerging concern in biodefense and biosecurity. Topics may include legal, ethical, scientific, economic, and political aspects of biodefense and biosecurity. May be repeated when topic is different.

BIOD 780: Master’s Supervised Internship (1-6:0:0)
Prerequisite: permission of program director or advisor. Internship under supervision of qualified professional in biodefense at a government agency, consulting firm, industrial firm, or other acceptable agency.

BIOD 793: Directed Studies in Biodefense (1-3:0:0)
Prerequisite: permission of the instructor and program director. Individualized study of topics not otherwise available in graduate program. May involve reading assignments, tutorials, lectures, papers, presentations, or lab or field study, determined in consultation with instructor.

BIOD 798: Master’s Research Project in Biodefense (3:0:0)
Prerequisites: 24 credits in BIOD, and permission of project director. Research project under supervision of faculty advisor, related to student’s concentration if applicable. Student produces substantial and original contribution to the field of biodefense on the model of an article in a scholarly journal. Students take either BIOD 798 or BIOD 799. Graded S/NC.

BIOD 799: Master’s Thesis in Biodefense (1-6:0:0)
Prerequisites: 24 credits in BIOD, and permission of thesis committee. Substantial and original research paper with guidance of faculty advisor. Thesis proposal must be approved in advance by advisor and two faculty, who comprise thesis committee. Completed research must be approved by committee and defended publicly in oral presentation. Graded S/NC.

BIOD 890: Doctoral Supervised Internship (1-6:0:0)
Prerequisites: permission of program director and advisor. Internship under supervision of qualified professional in biodefense at a government agency, consulting firm, industrial firm, or other acceptable agency.
BIOD 899: Directed Research in Biodefense (1-12:0:0)
   Prerequisite: approval of program director. Research on a pertinent topic in biodefense; scope and subject determined by instructor.

BIOD 998: Doctoral Dissertation Proposal (6-9:0:0)
   Prerequisite: advancement to candidacy or permission of program director. Work on research proposal that forms basis for doctoral dissertation under the guidance of dissertation committee. May be repeated, but only 9 credits may be applied to the degree. Graded S/NC.

BIOD 999: Doctoral Dissertation Research (15-18:0:0)
   Prerequisite: completion of 998. Research on approved dissertation topic under direction of dissertation committee. May be repeated for up to 9 credits in a semester, but no more than 18 total. Graded S/NC.

APPENDIX III: NON-BIOD ELECTIVES
These non-BIOD electives are approved for use to fulfill concentration and/or distribution requirements. Some electives can be counted for more than one concentration. The same course, however, cannot be used to fulfill requirements in more than one concentration. See appendix 2 for details on which courses count towards which concentrations. Students may be able to fulfill part of their concentration and/or distribution requirement with non-BIOD courses other than those listed here. Students must consult with their advisor on this matter and any substitutions must be approved by the Program Director.

GOVT 510: American Government and Politics (3:3:0)
   Examines institutions and processes of American government, including separate institutions of power in national government, theory and practice of federal system, role of interest groups and political parties, and effects of media and public opinion on electoral behavior and policy making. Seminar examining normative and empirical research.

GOVT 641: Seminar in Global Systems (3:3:0)
   Prerequisites: completion of all core courses. Applies systems approach to understanding global politics. Emphasizes properties and functions of global systems such as population, food, disease, energy, and trade, and how world's political systems interact with them. Discusses how governance at municipal, national, and international levels affected by global systems. Examines role of nongovernmental organizations in global affairs.

GOVT 706: Federalism and Changing Patterns of Governance (3:3:0)
   Prerequisite: GOVT 510. Examines broad trends in governance, including theory and practice of key governance choices, with particular focus on intergovernmental relations and changing roles of federal, state, and local governments. May include privatization, devolution, mandating, regulatory reform, and comprehensive federalism reform.

GOVT 741: Political Islam (3:3:0)
Provides an understanding of the many ways in which the religion of Islam plays a political role in the world today. The course begins with a brief history of Islam, paying particular attention to how ideas about political community and governance have evolved over time. The course then addresses a number of key themes such as the relationship between religion and politics, the compatibility of Islamic and Western ideas about democracy, the role of women in political society, and the impact of new media and IT technologies on religio-political discourse. These issues will be illuminated through case studies of contemporary political Islam in a broad range of geographical and cultural settings. The course will conclude with some consideration of the future of political Islam in the context of increasing globalization.

GOVT 745: Issues in International Security (3:3:0)
Prerequisites: GOVT 540. Examines nuclear strategy, arms control, U.S. defense policy, ethics and international security, and international terrorism, among other topics.

GOVT 755: Seminar in Politics and Bureaucracy (3:3:0)
Prerequisite: GOVT 510. Explores research and theory on political causes and effects of actions of government bureaucratic agencies. Readings examine origins of agencies, influences on decisions and programs, sources of internal and external accountability, pathologies of bureaucracies, and contributions bureaucracies make on effective and just governance.

GOVT 843: Diplomacy (3:3:0)
Prerequisite: GOVT 540. Advanced graduate seminar on theory and practice of diplomacy; alliance construction and destruction; coercive and cooperative diplomacy; diplomacy of certain great powers such as America, Russia, China, France, and Japan, and small and revolutionary powers. Also examines diplomacy and the media, and day-to-day diplomacy.

PUAD 504: Managing in the International Arena: Theory and Practice (3:3:0)
Theoretical and empirical examination of international system that both affects and is affected by decisions, behaviors, and subsystems of state and nonstate (organizational) actors.

PUAD 631: Disaster Response and Recovery Operations (3:3:0)
Explores the principles and practices that promote effective disaster response operations and management. The course will examine the nature of disasters, models for response operations in the United States, and responsibilities of various emergency management-related organizations.

PUAD 635: Emergency Preparedness: Interagency Communication and Coordination (3:3:0)
This course considers the complex relationships within governments and across sectors and levels of government for effective emergency management in planning, response, recovery, and mitigation phases. Intergovernmental management and network management theories and research will be explored to understand the nature of interorganizational problems and potential models for collaboration.

PUAD 701: Cross-Cultural and Ethical Dimensions of International Management (3:3:0)
To be taken in final two semesters of MPA program. Examines normative issues in management of programs in international context. Emphasizes interplay of cultural, sociopolitical, legal, and ethical factors, and management and policy problems arising from conflicting goals, values, and inequities among nations and regions.

**PUAD 727: Seminar in Risk Assessment and Decision Making (3:3:0)**

*Prerequisite: 12 graduate credits.* Examines decision making under risk and uncertainty. Readings introduce major intellectual perspectives on topic and are drawn from variety of disciplines, including biology, economics, law, and psychology. Emphasizes making actual decisions under uncertainty.

**PUAD 731: Homeland Security: Transportation Security Administration (3:3:0)**

Examines the terrorist attacks of 9/11, the vulnerabilities in the aviation security system, and reasons why elected leaders and officials did not act more decisively to improve security. Includes the development of radical Islam and the rise of Osama bin Laden and Al Qaeda. (Previously PUAD 729.)

**PUAD 750: Federalism and Intergovernmental Relations (3:3:0)**

*Prerequisites: PUAD 502, and 9 graduate credits.* Examines broad trends in governance, including theory and practice of various governance choices. Choices include privatization, decentralization of governmental activity, grants-in-aid and growth of mandates, changing role of state and local governments, proposals for reforming federalism, and regulatory reform.

**PUBP 757: Public Policy in Global Health and Medical Practice (3:3:0)**

Introduces international medical policy. Covers globalization of health and medical policies directed at removing disparities, financing, ethical considerations of biomedical research, and use of emerging technologies.

**PUBP 758: Global Threats and Medical Policies (3:3:0)**

Explores medical and health governance, biosecurity and biosafety, health and natural and human-made disasters, humanitarian and emergency assistance, vaccine development, behavior and health, critical infrastructures, bioethics and resource allocations in global context.

**PHIL 642: Biomedical Ethics (3:3:0)**

*Prerequisite: graduate standing, or permission of instructor.* Explores the application of ethical theories and principles to issues in contemporary health care. Cases central to the development of the field will be examined.
APPENDIX III: ELECTIVE COURSES BY CONCENTRATION

International Security
GOVT 745 International Security
GOVT 744 Foundations of Int'l Sec
GOVT 7XX US Security Policy
GOVT XXX Media & Int'l Affairs
BIOD 621 Ethics and Int'l Sec
BIOD 622 Negotiation in the International Arena
BIOD 705 Intel: Thy & Practice
PUAD 504 Managing in the Intl Arena
PUAD 634 Management of Intl Security
PUAD 636 NGO Policy and Management

Terrorism & Homeland Security
BIOD 722 Examining Terrorist Groups
BIOD 725 Terrorism & WMD
BIOD 726 Agroterrorism/Food Security
BIOD 723 Legal Dimensions HS*
BIOD 752 Role of Military in HS*
PUAD 731 Transportation Security
PUAD 630-636 (Emergency/Homeland)
PUAD 795 Leadership in JSOs
PUAD 797 Changing JSOs
PUAD 790 Justice Organization and Administration

WMD & Technology
BIOD 760 Nat Sec Tech Policy
BIOD 706 NBC Policy & Security
BIOD 709 Nonproliferation & Arms Control
BIOD 620 Health and Security
BIOD 751 Biosurveillance
BIOD 710 Bioweapons Media Treatment/Response
BIOD 766 Vaccines & Therapeutics
APPENDIX IV: BIODEFENSE FACULTY

Full-Time Faculty

Daniel Druckman is a Professor in the Department of Public and International Affairs. He has published widely on such topics as negotiating behavior, nationalism and group identity, human performance, peacekeeping, political stability, nonverbal communication, and research methodology. He received his Ph.D. in Social Psychology from Northwestern University.

Frances Harbour is an Associate Professor in the Department of Public and International Affairs. She is the civilian representative and treasurer of the International Symposium on Military Ethics, formerly J-SCOPE, and was a founding member and officer of the International Ethics section of the International Studies Association. Dr. Harbour is the author of Thinking about International Ethics: Moral Theory and Case Studies in American Foreign Policy, as well as numerous articles on ethical issues pertaining to chemical and nuclear weapons. She received her Ph.D. in Political Science with a specialization in security studies from Columbia University.

Gregory D. Koblentz is an Assistant Professor in the Department of Public and International Affairs and Deputy Director of the Biodefense Graduate Program at George Mason University. Dr. Koblentz is also a member of the Scientist Working Group on Chemical and Biological Weapons at the Center for Arms Control and Non-Proliferation. His research and teaching focus on international security, terrorism, homeland security, and weapons of mass destruction. He received his Master in Public Policy from the John F. Kennedy School of Government at Harvard University and his Ph.D. in Political Science from the Security Studies Program at the Massachusetts Institute of Technology.

Allison MacFarlane is an Assistant Professor of Environmental Science and Policy, and was sworn in as chairman of the U.S. Nuclear Regulatory Commission July 9, 2012. She was nominated by President Obama and confirmed by the Senate to a term expiring June 30, 2013. Dr. Macfarlane, an expert on nuclear waste issues, holds a doctorate in geology from the Massachusetts Institute of Technology and a bachelor’s of science degree in geology from the University of Rochester. Dr. Macfarlane is an associate professor of environmental science and policy at George Mason University. From 2010 to 2012 she served on the Blue Ribbon Commission on America’s Nuclear Future, created by the Obama Administration to make recommendations about a national strategy for dealing with the nation’s high-level nuclear waste. Her research has focused on environmental policy and international security issues associated with nuclear energy, especially the back-end of the nuclear fuel cycle. In 2006, MIT Press published a book she co-edited, Uncertainty Underground: Yucca Mountain and the Nation’s High-Level Nuclear Waste, which explored technical issues at the proposed waste disposal facility at Yucca Mountain, Nev.

Sonia Ben Ouagrham-Gormley is an Assistant Professor in the Department of Public and International Affairs. Previously, she was a Senior Project Manager for the Center for Nonproliferation Studies and Editor-in-Chief of the NIS Export Control Observer. In 2002-2005 she conducted a study of the Anti-Plague System of Central Asia and the Caucasus. Dr. Ben Ouagrham-Gormley’s main research interests are export controls and WMD-related trafficking in
the former Soviet Union, the role of tacit knowledge in the transfer of BW knowledge, conversion of former biological and chemical facilities, and proliferation financing. She received her Ph.D. in Economics of Development at the Advanced School of Social Sciences in Paris, France.

**Trevor Thrall** is an Associate Professor in the Department of Public and International Affairs and the Director of the Biodefense Program (BIO to come). He teaches courses in international security, political communication, and U.S. military intervention. His recently edited book, *American Foreign Policy and the Politics of Fear: Threat Inflation since 9/11* (Routledge 2009), examined why and how the Bush administration was able to build public support for the war in Iraq in 2003. The companion volume to that work, *Why Did the United States Invade Iraq?* (Routledge 2011), collects competing explanations about why the administration decided to go to war in the first place. Prior to arriving at George Mason, Dr. Thrall was an associate professor at the University of Michigan-Dearborn where he directed the Master of Public Policy and Master of Public Administration programs. He received his Ph.D. in political science from Massachusetts Institute of Technology.

**Adjunct Faculty**

**Denise Bakken**’s research investigates the hypothesis that al Qaeda executes its missions using a business method approach. During her investigations, she has identified a value factor for mission execution, communication/influence factor for mission activity, WMD list potential and profile of WMD selection criteria. Subsequent work on an Office of Net Assessment effort led to the development of the *Biotechnology Industry Competitive Intelligence Terrorism Threat Analysis Tool*, a biotechnology innovations and advancement monitor used to estimate the penetration of mal-intentioned organizations or individuals who seek to exploit the industry’s capabilities to threaten the interests of the United States and its allies. Dr. Baken retired as an Army Colonel after 28 years and a career that included positions as Chief of Staff for the Special Assistant to the Deputy Secretary of Defense for Chemical and Biological Protection where she developed and implemented chemical and biological warfare healthcare policies for the Department of Defense. Most recently she was Director, Biodefense Programs at the Center for Innovative Technology, Herndon, Virginia. She is currently Adjunct Assistant Professor of Biodefense and Biosecurity at the University of Maryland University College and Affiliate Faculty, Public and International Affairs at George Mason University. Dr. Bakken is currently President of Shield Analysis Technology, LLC, Manassas, Virginia.

**Charles Blair** is the Senior Fellow on State and Non-State Threats at the Federation of American Scientists and an adjunct professor at GMU, where he lectures on the nexus of terrorism and WMD. Since the 1980s, Mr. Blair has worked on issues relating to the diffusion and diversification of weapons of mass destruction (WMD) in the context of proliferation amid the rise of mass casualty terrorism incidents and the centripetal and centrifugal elements of globalization. Mr. Blair’s work focuses on state and violent non-state actors (VNSA) – amid a dystopic and increasingly tribal world. Before joining FAS in 2010, he was a research associate with the National Consortium for the Study of Terrorism and Responses to Terrorism (START) where, among other projects, he managed the Global Terrorism Database, the largest open-source compilation of terrorist events in the world. Mr. Blair also spent two years exploring
elements of the Pakistani Neo-Taliban, and for almost a decade he has studied U.S. right-wing “White” nationalist groups, apocalyptic millenarian ideologies, and other groups with interest in and experiences with WMD. Mr. Blair has also worked with the James Martin Center for Nonproliferation Studies, the National Nuclear Security Administration, the Anti-Defamation League, and the Center for Terrorism and Intelligence Studies. Mr. Blair is also a lecturer at Johns Hopkins University where he instructs graduate students about the technologies underlying WMD.

Roger Breeze is the former director of Plum Island and an Adjunct Professor in the Biodefense Department, where he lectures on agroterrorism. Dr. Breeze received his veterinary degree in 1968 and his PhD in veterinary pathology in 1973, both from the University of Glasgow, Scotland. He was engaged in teaching, diagnostic pathology, and research on respiratory and cardiovascular diseases at the University of Glasgow Veterinary School from 1968 to 1977 and at Washington State University College of Veterinary Medicine from 1977 to 1987, where he was professor and chair of the Department of Microbiology and Pathology. From 1984 to 1987, he was deputy director of the Washington Technology Center, the state’s high-technology sciences initiative, based in the College of Engineering of the University of Washington. In 1987, he was appointed director of the U.S. Department of Agriculture (USDA) Plum Island Animal Disease Center, a Biosafety Level 3 facility for research and diagnosis related to the world’s most dangerous livestock diseases. In that role, he initiated research on the genomic and functional genomic basis of disease pathogenesis, diagnosis, and control of livestock RNA and DNA virus infections. That work became the basis of U.S. defense against natural and deliberate infection with these pathogens and led to his involvement in the early 1990s in biologic-weapons defense and proliferation prevention. From 1995 to 1998, Dr. Breeze directed research programs in 20 laboratories in the Southeast for the USDA Agricultural Research Service before going to Washington, D.C., to establish biologic-weapons defense research programs for USDA. He received the Distinguished Executive Award from President Clinton in 1998 for his work at Plum Island and in biodefense. Since 2004 he has been CEO of Centaur Science Group. He is currently Bio-Security Deputy Program Director, Global Security Directorate, Office of Strategic Outcomes, Lawrence Livermore National Laboratory.

Michael Dennis received his doctorate in the history of science from the Johns Hopkins University in 1991. He previously taught at UCSD and Cornell University as well as Georgetown University and the Northern Virginia Campus of Virginia Tech, His research interests lie in the areas of the history of American science and technology, the historiography of science and technology, and the politics of science and technology. He is completing a book manuscript entitled A change of state: political culture, technical practice and the making of Cold War America detailing the transformations wrought in the technical and organizational practices of researchers in university laboratories before, during and after World War II.

Robert House is an adjunct professor in the GMU Biodefense Program, where he teaches medical countermeasure development. He is President of DynPort Vaccine Company LLC, a CSC company, which manages product development programs for government agencies, and provides consulting, technical and program management services to companies in the biotechnology and pharmaceutical industries. DynPort’s portfolio includes vaccines and therapeutics to protect against emerging infectious diseases including biological warfare threat
agents and seasonal and pandemic influenza. Prior to joining DynPort, Dr. House worked at Covance Laboratories in Madison, Wis., and IIT Research Institute in Chicago, Ill., where he managed highly successful programs in immunotoxicology assessment. He has nearly 30 years of experience in biomedical research and development, specializing in the assessment of inadvertent and therapeutic immunomodulation. Dr. House earned his Master of Science in Public Health (MSPH) and Ph.D. degrees in Medical Parasitology from the University of North Carolina School of Public Health, and is the author, co-author or editor of more than 100 journal articles and book chapters in the areas of immunotoxicology, host defense, cytokine biology and biodefense. Dr. House was also recently named Vice President Elect of the Society of Toxicology’s Biotechnology Specialty Section. He is a certified Project Management Professional (PMP) and a Fellow of the Academy of Toxicological Sciences.

**Linda Millis** is an adjunct professor in the GMU Biodefense program, where she teaches the theory and practice of intelligence. Ms. Millis is the former Director of National Security at the Markle Foundation, a non-profit organization devoted to improving the use of information technology to address critical public needs in the areas of health and national security. Ms. Millis has more than two decades of experience with national security issues, including threat assessment, intelligence analysis, intelligence program management, domestic preparedness for bioterrorism threats, tracking the financial assets of terrorists, and protecting critical infrastructure. She has held senior positions at the National Security Agency, Central Intelligence Agency, the Intelligence Community Management Staff, the President's Foreign Intelligence Advisory Board, and the Commission on the Roles and Capabilities of the Intelligence Community (also known as the Aspin/Brown Commission). She is also a certified arms control inspector for several nuclear weapons treaties. Ms. Millis earned her MA/MS in International Public Policy from the Johns Hopkins School of Advanced International Studies.
## MS Chart

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Apply</th>
<th>Become a Mason Student</th>
<th>Degree Plan &amp; Classes</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete online application on Admissions website at <a href="http://admissions.gmu.edu/graduate/applynow/">http://admissions.gmu.edu/graduate/applynow/</a></td>
<td>1. Activate your student email address (<a href="http://masonlive.gmu.edu/gettingstarted.html">http://masonlive.gmu.edu/gettingstarted.html</a>)</td>
<td>1. Meet with your assigned advisor during your first semester (identified in your admissions packet from PIA) to complete your degree plan</td>
<td>1. Apply to graduate on PatriotWeb. For directions and deadlines, visit <a href="http://registrar.gmu.edu/graduation/">http://registrar.gmu.edu/graduation/</a></td>
<td></td>
</tr>
<tr>
<td>2. Mail transcripts to CHSS Graduate Admissions; all other materials are submitted through the online application system</td>
<td>2. Submit your immunization records (<a href="http://shs.gmu.edu/immunizations/requirements">http://shs.gmu.edu/immunizations/requirements</a>)</td>
<td>2. Submit the degree plan to PIA Graduate Office (Robinson Hall A253) during your first semester in the program</td>
<td>2. Check your student email regularly! You will be contacted should there be a problem with your application</td>
<td></td>
</tr>
<tr>
<td>4. When offered admission to our graduate program, email <a href="mailto:CHSSgrad@gmu.edu">CHSSgrad@gmu.edu</a> to accept or withdraw offer of admission</td>
<td>4. Pay for your classes by the first day of the semester ([<a href="http://studentaccounts.gmu.edu/tuition.html">http://studentaccounts.gmu.edu/tuition.html</a> &amp; financialaid.gmu.edu](<a href="http://studentaccounts.gmu.edu/tuition.html">http://studentaccounts.gmu.edu/tuition.html</a> &amp; financialaid.gmu.edu))</td>
<td>4. Take courses in order specified on your degree plan. If you plan to take a semester off (excluding summer) contact PIA Graduate Office</td>
<td>4. Diplomas will be mailed 6-8 weeks after degree conferral. Maybe sure your mailing address is up to date on PatriotWeb (<a href="http://registrar.gmu.edu/graduation/diplomaupdate">http://registrar.gmu.edu/graduation/diplomaupdate</a>)</td>
<td></td>
</tr>
</tbody>
</table>

### Support
- **PIA Graduate Office:** Peg Koback (mkoback@gmu.edu) or Amanda Myers (amyers6@gmu.edu)
- **Student email support:** ITU Support Center (703-993-8870)
- **Immunization Record Support:** Student Health Services (703-993-2831)
- **Selecting Courses:** PIA Graduate Office-- Peg Koback (mkoback@gmu.edu) or Amanda Myers (amyers6@gmu.edu)

- **CHSS Graduate Admissions Office:** (703-993-3699 or chssgrad@gmu.edu)
- **PIA Graduate Office:** Peg Koback (mkoback@gmu.edu) or Amanda Myers (amyers6@gmu.edu)
- **Graduation Services:** Registrar's Office (graduate@gmu.edu)

- **Selecting Courses:** PIA Graduate Office-- Peg Koback (mkoback@gmu.edu) or Amanda Myers (amyers6@gmu.edu)
### Apply

<table>
<thead>
<tr>
<th>Task</th>
<th>Contact Information and Tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete <a href="#">online application</a></td>
<td>Tip: Setting up emailing forwarding from your GMU email account to your most-checked email account is a good idea HOWEVER make sure you clean out your GMU inbox periodically - it has a limited capacity. Once it's full, you will receiving emails, and you'll miss crucial information.</td>
</tr>
<tr>
<td>2. Mail transcripts to CHSS Graduate Admissions; all other materials are submitted through the online application system</td>
<td>Student email support-- ITU Support Center (703-993-8870)</td>
</tr>
<tr>
<td>3. Check application status <a href="#">online</a> or email <a href="#">Graduate Admissions</a></td>
<td></td>
</tr>
<tr>
<td>4. When offered admission to our graduate program, email CHSS to accept or withdraw offer of admission</td>
<td></td>
</tr>
</tbody>
</table>

### Become a Mason Student

<table>
<thead>
<tr>
<th>Task</th>
<th>Contact Information and Tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Activate your <a href="#">student email address</a>. PLEASE CHECK YOUR MASON EMAIL ACCOUNT at least once a week. This is how we will communicate with you.</td>
<td>Tip 2: Don't be afraid to take electives outside of biodefense! Any elective in PUBP and GOVT is up for grabs - and if you desperately want to take a course not offered at GMU, see if it's on at one of the other DC consortium schools!</td>
</tr>
<tr>
<td>2. Submit your <a href="#">immunization records</a></td>
<td></td>
</tr>
<tr>
<td>3. Select the courses you plan to take and <a href="#">register on Patriot Web</a></td>
<td></td>
</tr>
<tr>
<td>4. Pay for your classes <a href="#">by the first day of the semester</a></td>
<td>Immunization Record Support-- Student Health Services (703-993-2831)</td>
</tr>
<tr>
<td>5. Like us <a href="#">on facebook</a> and say hello, follow us on <a href="#">Twitter</a>, join the GMU Biodefense LinkedIn group and email the social media coordinator to say hi! They'll ask you later for blog contributions and reviews.</td>
<td>PIA Graduate Office-- <a href="#">Peg Koback</a> or <a href="#">Amanda Myers</a></td>
</tr>
</tbody>
</table>

### Degree Plan and Classes

<table>
<thead>
<tr>
<th>Task</th>
<th>Contact Information and Tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Meet with your assigned advisor during your first semester (identified in your admissions packet from PIA) to complete your degree plan</td>
<td>Tip 1: Certain required courses are offered by the Public Administration program and Political Science program respectively. In order to register for them, search within those degree programs (PUAD and GOVT).</td>
</tr>
<tr>
<td>2. Meet with Peg Koback, the Graduate Coordinator, to discuss any reduction of credit (if applicable) ASAP. Deadline: within the first year of the program</td>
<td>Tip 2: Don't be afraid to take electives outside of biodefense! Any elective in PUBP and GOVT is up for grabs - and if you desperately want to take a course not offered at GMU, see if it's on at one of the other DC consortium schools!</td>
</tr>
<tr>
<td>3. Submit the degree plan to PIA Graduate Office (Robinson Hall A253) during your first semester in the program. You should periodically discuss your degree plan with your advisor and/or Peg Koback.</td>
<td></td>
</tr>
<tr>
<td>4. Visit PIA <a href="#">online</a> for a tentative schedule of classes for upcoming semesters</td>
<td></td>
</tr>
</tbody>
</table>
However, remember that any elective that is not on the list of approved electives for BIOD must be approved by the advisor prior to registration.

5. Take courses in order specified on your degree plan.* If you plan to take a semester off (excluding summer) contact PIA Graduate Office

Selecting Courses-- PIA Graduate Office-- Peg Koback or Amanda Myers

### Qualifying Exams

1. After you have completed all of your coursework you are eligible to take the qualifying exams.  
Tip: Form a study group! The reading list is huge.

2. The Graduate Office will send out an email to the PhD listserve announcing the upcoming dates for the qualifying exams.  
PIA Graduate Office

3. Notify the Graduate Office that you wish to take the qualifying exams. Be sure that you have submitted an updated Degree Plan form.

4. If you do not pass the exam on the first try you can take the exam one more time. If you do not pass the exam after the second try, you will be dismissed from the program.

### Advance to Candidacy

1. After you have completed all the coursework and you have passed the qualifying exams you are eligible to advance to candidacy

2. Paperwork required to advance to candidacy includes: Advancement to Candidacy form, Degree Plan form, Reduction of Credit form (if applicable).

3. Student will receive notification in the mail that the Advancement to Candidacy has been approved. KEEP YOUR ADDRESS UPDATED ON PatriotWeb!

4. Before you can register for BIOD 998 Dissertation Proposal you must complete and submit a Dissertation Committee Approval Form. Form can be found [here](#).

### Dissertation Proposal BIOD 998

1. Submit Dissertation Committee Approval Form to the Graduate Coordinator. The form can be found [here](#)

2. The Graduate Coordinator will issue you a CRN# for the semester so that you can register.

3. Each semester you will need a new CRN before you can register. Contact the Graduate Coordinator no less that 2 weeks prior to the start of the semester to receive the CRN#. **Remember, continuous enrollment (excluding summers) is required.**

4. It is important to stay in touch with your committee. Meet with the Chair of your Dissertation Committee either by phone, email or in person once a semester or as needed.

5. Notify the Graduate Coordinator at least 3 weeks in advance of the date that you will be defending your dissertation proposal.

4. Remember, continuous enrollment (excluding summers) is required.
6. If you successfully defend your proposal, you will need to submit a Proposal Approval form to the Graduate Coordinator. You are now eligible to enroll in BIOD 999 Dissertation.

<table>
<thead>
<tr>
<th><strong>Dissertation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOD 999</strong></td>
</tr>
<tr>
<td>1. To enroll in BIOD 999, you must send an email, from your Mason email account to <a href="mailto:chssdiss@gmu.edu">chssdiss@gmu.edu</a>. Email must include your name, name of dissertation chair, name of department and number of credits you wish to enroll. This must be done each semester.</td>
</tr>
<tr>
<td>2. You must stay continuously enrolled in BIOD 999, excluding summers.</td>
</tr>
<tr>
<td>3. You must be enrolled for at least 3 credits a semester until the minimum number of credits has been reached. Then you can register for one (1) a semester.</td>
</tr>
<tr>
<td>4. VERY IMPORTANT: You must adhere to the deadlines, format requirements found <a href="#">here</a>.</td>
</tr>
<tr>
<td>5. When you are ready to defend your dissertation - you must notify the Graduate Coordinator no less than 3 weeks prior to the defense date.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Graduate</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply to graduate on PatriotWeb. For directions and deadlines, see <a href="#">here</a>. You must be registered in the semester in which you want to graduate.</td>
</tr>
<tr>
<td>2. Check your student email regularly! You will be contacted should there be a problem with your application</td>
</tr>
<tr>
<td>3. Attend convocation. Details for the event can be found <a href="#">here</a>.</td>
</tr>
<tr>
<td>4. Diplomas will be mailed 6-8 weeks after degree conferral. Maybe sure your mailing address is up to date on <a href="#">PatriotWeb</a>.</td>
</tr>
</tbody>
</table>