# PHD IN BIODEFENSE - PROGRAM GUIDE

## Table of Contents

I. SCHAR SCHOOL OF POLICY AND GOVERNMENT DOCTORAL PROGRAM OVERVIEW

II. PHD PROGRAM REQUIREMENTS

III. PHD PROGRAM DEGREE PLAN

IV. COURSE DESCRIPTIONS

V. ADMISSIONS AND APPLICATION INFORMATION

VI. FINANCIAL AID AND COST INFORMATION

VII. ADMITED GRADUATE STUDENT PROFILE

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This guide incorporates most of the requirements and rules pertaining to the Biodefense PhD Program in the Schar School of Policy and Government. In addition, the University Catalog and associated requirements and rules, along with other pertinent University policies apply to, and in the case of inconsistency, take precedence over this guide.

Revised: September 7, 2018
The Schar School of Policy and Government (Schar School) is at the heart of George Mason University's commitment to government and policy studies and research. Located in both Fairfax and Arlington, Virginia, the Schar School takes advantage of its location in the National Capital Region, offering students and faculty unique opportunities to study federal executive and legislative governance and policy-making, as well as international organizations and government agencies.

The Schar School of Policy and Government conducts policy research in a number of fields, including terrorism and international security; medical and public health preparedness; governance and public management; regional economic development; transportation policy; politics and Islam; science and technology policy; economic policy; and Russian, Central Asian, and East Asian politics.

The school is home to three doctoral programs – Biodefense, Political Science, and Public Policy. The structure of the school and its dedication to interdisciplinary education and research allow it to reach across Mason to bring together the knowledge and skills needed to address a wide variety of policy concerns. While most members of the core faculty holds full-time tenured positions, other members of the Schar School faculty are from other university departments and schools. In addition, faculty and students in the Schar School are published widely in primary academic and professional journals on topics including American politics and policy, comparative politics, legislative and executive branch operations, federalism, weapons of mass destruction, international security, environmental policy, Latin American politics, and foreign affairs. In addition to the academic faculty and graduate students, the Schar School hosts a substantial number of senior fellows, visiting faculty, post-doctoral associates, and other researchers from around the world, all of whom make essential contributions to research, teaching, and outreach activities.

The Schar School’s faculty offers both depth and breadth in the scholarship of the primary fields of the Biodefense program: international security; terrorism and homeland security; and technology and weapons of mass destruction. In addition to our full-time faculty, the Biodefense program draws on the expertise of Washington, DC area professionals as part-time instructors, from organizations such as the Federation of American Scientists, the US Department of Agriculture, DynPort Vaccine Company, the Office of the Director of National Intelligence, and the American Type Culture Collection.

**DOCTORAL PROGRAM OVERVIEW**

The biodefense graduate program at Mason prepares students to assess and reduce biological threats posed by weapons of mass destruction, terrorism, pandemics, and emerging infectious diseases. The doctoral program prepares students to serve as scholars and professionals in the fields of biodefense and biosecurity. The program integrates knowledge of natural and man-made biological threats with the skills to develop and analyze policies and strategies for enhancing biosecurity. Other areas of biodefense including nonproliferation, intelligence and threat assessment, and medical and public health preparedness are integral parts of the program.

Because of the breadth of the program, students with backgrounds in science and other areas, such as international affairs, political science, law, public policy, and conflict resolution, are encouraged to apply.

Students in the program study both full-time and part-time, and may change their status at any time. A full-time course load is three classes (nine credits). We recommend that a student not take more than 4 classes (12 credits) per semester. Graduate students who are enrolled in dissertation credits (either 998 or 999) are considered full-time, if they are enrolled in at least 6 credits per semester.
The degree requires 72 credits of course work divided among core courses, a field of specialization, supporting courses that can be outside the department, and dissertation guidance.

The course work will be allocated as follows:

- **Six required courses (18 credits)**: BIOD 604, 605, 609, 620; GOVT 500, 540
- **One additional advanced research course (3 credits)**: Must be approved by the program director. May be focused on qualitative or quantitative research.
- **Two required field seminars and 2 elective courses (12 credits)** in one of three fields of specialization (International Security; Terrorism & Homeland Security; Technology & WMD)
- **Two elective courses (6 credits)**: Students should select courses from fields other than their chosen field of specialization.
- **Electives (9-21 credits)**: Students complete the remaining 72 credits through additional elective courses chosen in consultation with an advisor.
- **Dissertation (12-24 credits)**: Once enrolled in 998, students must maintain continuous registration in 998 or 999 every semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. 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 6 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.

*Official program requirements are published in the annual PhD Student/Faculty Handbook issued to new students during orientation. The current issue is located on the program website:*

https://schar.gmu.edu/current-students/phd-student-services/phd-handbook-forms

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**George Mason University Libraries**

The University Libraries serve as both a repository of and digital portal to the wider universe of knowledge. The Libraries foster innovation, originality, and imagination by qualitatively managing access to scholarship and information, providing expert consultation in the research process, actively teaching the effective and critical use of information, and disseminating research and scholarship through publishing endeavors. Digital resources are accessible by students both on- and off-campus. Among many other resources, Fenwick Library in Fairfax is home to Mason’s print federal government documents collection; and Arlington Campus Library is designated as a European Union Document Depository, providing in-house access to non-circulating European Union documents for faculty, students and members of the public. As part of the Washington Research Library Consortium (WRLC), Mason students have use of major academic libraries in the Washington Metropolitan area, including The George Washington University, American University and Georgetown University. More information is available at

http://library.gmu.edu
PHD IN BIODEFENSE
Schar School of Policy and Government
Education Plan for students admitted Fall 2018

Student name: ___________________________________  G#: _______________________
Advisor: _______________________________  Anticipated Graduation Date: _______________________

Core Coursework – 21 credits

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
<th>Grade</th>
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<tbody>
<tr>
<td>BIOD 604</td>
<td>Emerging Infectious Diseases I: Bacteria and Toxins (formerly Intro to Biodefense I: Bacterial &amp; Toxin Agents)</td>
<td>3</td>
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<tr>
<td>BIOD 605</td>
<td>Emerging Infectious Diseases I: Viral Agents (formerly Intro to Biodefense II: Viral Agents)</td>
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<tr>
<td>BIOD 609</td>
<td>Biodefense Strategy (formerly Biodefense Strategy &amp; Policy)</td>
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<td>BIOD 620</td>
<td>Global Health Security Pol</td>
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<tr>
<td>GOVT 500</td>
<td>The Scientific Method &amp; Research Design</td>
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<tr>
<td>GOVT 540</td>
<td>International Relations</td>
<td>3</td>
<td></td>
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<tr>
<td>POGO 611 or POGO 646</td>
<td>611: Advanced Data Analysis for Policy and Government or 646: Policy and Program Evaluation</td>
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Field of Specialization – 12 credits

International Security: 2 required field courses + 6 credits of electives

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<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
<th>Grade</th>
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<tr>
<td>GOVT 744 (required)</td>
<td>Foundations of Security Studies</td>
<td>3</td>
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<tr>
<td>GOVT 745 (required)</td>
<td>International Security</td>
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<td>Elective ________</td>
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<td>Elective ________</td>
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Terrorism and Homeland Security: 2 required field courses + 6 credits of electives

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<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
<th>Grade</th>
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<tbody>
<tr>
<td>BIOD 722 (required)</td>
<td>Examining Terrorist Groups</td>
<td>3</td>
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<tr>
<td>BIOD 725 (required)</td>
<td>Terrorism and WMDs</td>
<td>3</td>
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<td>Elective ________</td>
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Technology and WMD: 2 required field courses + 6 credits of electives

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<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
<th>Grade</th>
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<tbody>
<tr>
<td>BIOD 706 (required)</td>
<td>Nuclear, Biological, &amp; Chemical Weapons Policy &amp; Security</td>
<td>3</td>
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<tr>
<td>BIOD 760 (required)</td>
<td>National Security Technology and Policy</td>
<td>3</td>
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<td>Elective ________</td>
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Courses outside of the specialization – 6 credit hours

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<th>Course #</th>
<th>Course Title</th>
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Electives – 9 - 21 credits

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Dissertation Credits

998 Proposal: min 3, max 6. 999 Dissertation: min 6, max 18. 998+999 combined: min 12, max 24

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<th>Course #</th>
<th>Course Title</th>
<th>Credits/Semester</th>
<th>Credits/Semester</th>
<th>Credits/Semester</th>
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<tbody>
<tr>
<td>BIOD 998</td>
<td>Dissertation proposal</td>
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<tr>
<td>BIOD 999</td>
<td>Dissertation Research</td>
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Approved Transfer Credits – 12 maximum  And/Or  Reduction of Credit – 30 maximum

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<thead>
<tr>
<th>Institution</th>
<th>Course Number and Title</th>
<th>Credit Hours</th>
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Total Credit Hours: ______________

Anticipated Completion Dates

Qualifying Exam: ________________________________

Dissertation Proposal (BIOD 998): __________________

Dissertation Research (BIOD 999): __________________

Advisor Signature: ________________________________ Date: ________________

Student Signature: ________________________________ Date: ________________
BIODEFENSE COURSE DESCRIPTIONS*

The most updated Schedule of Courses is available through the GMU website at:  
https://patriotweb.gmu.edu/pls/prod/bwckschd_p_disp_dyn_sched  
You may review prior course syllabi through the program website:  
http://schar.gmu.edu/current-students/course-syllabi-and-schedule/

Biodefense students may be interested in relevant courses in ITRN, GOVT, PUAD, and PUBP. Please see the Schar School website for more information.

BIOD 604 Emerging Infectious Diseases I: Bacteria and Toxins: Covers the microbiology, pathogenesis, clinical effects, and epidemiology of bacteria and toxins that pose threats to global health or can be utilized as biological weapons. (3 credits)

BIOD 605 Emerging Infectious Diseases II: Viral Agents: Covers the microbiology, pathogenesis, clinical effects, and epidemiology of viruses that pose threats to global health or can be utilized as biological weapons. (3 credits)

BIOD 609 Biodefense Strategy: 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. (3 credits)

BIOD 620 Health and Security: Explores issues emerging from the interaction of health and security that represent novel challenges to policy makers confronting a rapidly changing international landscape. Examines the origin and evolution of the concept of health security. Analyzes strategic impact of infectious disease outbreaks, global health security case studies, global health governance, and formulation and implementation of U.S. global health security policy. (3 credits)

BIOD 706 Nuclear, Biological, and Chemical Weapons Policy and Security: Explores the causes, conduct, and consequences of the proliferation of nuclear, biological, and chemical weapons. Covers the historical, technological, normative, and strategic factors that have promoted and restrained the spread of these weapons. Addresses the motives for states to develop these weapons and the debate over the security implications of nuclear, biological, and chemical weapon proliferation. (3 credits)

BIOD 709 Nonproliferation and Arms Control: Examines the array of national and international measures used to slow, halt, and reverse the spread of nuclear, biological, chemical, and missile weapons. Explores the theory and practice of proliferation to provide insights into the supply and demand aspects of proliferation. (3 credits)

BIOD 722 Examining Terrorist Groups: Introduction to terrorism including the history and evolution of terrorism, case studies of key terrorist groups, the current nature of the terrorist threat and counterterrorism strategies. (3 credits)

BIOD 725 Terrorism and Weapons of Mass Destruction: 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. (3 credits)

BIOD 726 Food Security: Analyzes threats to food security globally including those related to climate change and environmental degradation; animal and plant diseases; access to clean water; agricultural terrorism; and antimicrobial resistance. Explores the national and global health, economic, social, and ethical impacts of these disruptive forces. Examines strategies for enhancing the security of the global food production and supply systems. (3 credits)

BIOD 751 Biosurveillance: Provides an understanding of the capabilities required to provide reliable early warning of disease outbreaks and identify their etiological agents. Assesses strengths and limitations of physicians, laboratories, epidemiologists, aerosol sensors, and syndromic surveillance systems. Considers challenges posed by the integration and analysis of the information collected by these sources. (3 credits)

BIOD 760 National Security Technology and Policy: 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, nonlethal weapons, nanotechnology, bioengineering, energy security, and pandemic influenza. (3 credits)

**BIOD 766 Development of Vaccines and Therapeutics:** Analyzes the process of developing new medical countermeasures against biological weapons and emerging infectious diseases such as SARS and pandemic influenza. Special attention is paid to the scientific, technical, political, regulatory, and economic obstacles to developing new vaccines and therapeutics. Examines the causes and potential solutions of public and private sector failures. (3 credits)

**BIOD 998 Doctoral Dissertation Proposal:** Work on research proposal that forms basis for doctoral dissertation (3-6 credits)

**BIOD 999 Doctoral Dissertation Research:** Research on approved dissertation topic under direction of dissertation committee. (1-12 credits)

**GOVT 500 The Scientific Method and Research Design:** Grounds students in the principles of the scientific method as the framework for investigating all research questions in political science, whether qualitative or quantitative in character (or both). Focus is on sound and rigorous research design. (3 credits)

**GOVT 540 International Relations:** 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 non-security issues in emerging international agenda. (3 credits)

**GOVT 717 Qualitative Methods:** Focuses on scientific design of qualitative research questions and use of specific qualitative methods in scientific analysis. Covers when and how to use qualitative research methods to answer empirical questions in political science; primary data collection methods (interviews, observations, document review); the appropriateness of different research approaches; procedural and ethical concerns that may arise in use of qualitative methods. (3 credits)

**GOVT 744 Foundations of Security Studies:** Introduces students to a selection of the original sources of the most important ideas that form the basis of security studies as a subfield of political science. (3 credits)

**GOVT 745 International Security:** Examines interplay of international politics and international security. Discusses theoretical perspectives and analytical tools in academic field of international security, and applies theories and tools to nuclear, biological, and chemical weapons, strategy and defense, and arms control. How domestic issues affect defense policies, terrorism, changing nature of international conflict, and human security will be examined. (3 credits)

**POGO 611 Advanced Data Analysis for Policy and Government:** Introduces advanced statistical techniques to analyze policy, government and other social science data. Covers classical regression methods and their application to public policy analysis. Covers linear and non-linear regressions using cross sectional, time-series and panel data, and problems associated with applications including specification error, multicollinearity, qualitative variables, heteroskedasticity, serial correlation, and structural identification. (3 credits)

**POGO 646 Policy and Program Evaluation:** Practical exploration of assessment techniques used in studying results of public programs and policies, including evaluation of implementation strategies and impacts. (3 credits)

*Official program requirements are published in the annual PhD Student/Faculty Handbook issued to new students during orientation. The current issue is located on the program web site:
Doctoral applicants are strongly encouraged to apply for admission in the fall semester, for both full-time and part-time study. There is no spring admission cycle available for our PhD program.

The GMU graduate application process requires the applicant to submit a complete set of documents with the application. All application credentials must be received before the application will be reviewed.

1. Graduate application and the online $75 application fee. There are no fee waivers. Please note that when completing the online application, you will be required to submit this fee by credit card payment. The graduate application can be completed at: http://admissions.gmu.edu/ApplyNow. Applications will not be reviewed without payment.

2. A statement of professional goals (usually two pages). The goals statement should be 750 to 1,000 words. Please print your name and birth date on the goals statement if it is sent in separately from the application so that we will be able to link this to your on-line application. Please describe your personal qualities and development and how they have influenced your career choice; discuss your reasons for considering this particular program in relation to your academic background, professional work experience, and career goals; detail which fields in which you expect to conduct research, and describe how these interests have been influenced by your prior education, research, or work experience. Also discuss why you are considering a career in an academic or research setting, and include any other information relevant for evaluating your motivation to study and conduct research at the doctoral level.

3. A current resume or vitae.

4. Submission of transcripts.

   Domestic Applicants – upload unofficial copies of transcripts from ALL U.S. accredited institutions attended.
   International Applicants - Students presenting international credentials must upload unofficial transcripts, degree certificates/diplomas, AND certified translations of the documents in English (if applicable). More information can be found on the International Applicant Requirements page: https://schar.gmu.edu/prospective‐students/admissions/international‐applicant‐requirements.

5. Graduate Record Examination (GRE) official score are required. GRE scores must have been earned within the past 5 years. There is no waiver for this requirement. George Mason code is 5827. There is no department code.

6. Three letters of recommendation from professional or academic contacts. It is strongly encouraged that you request academic letters of recommendation from past professors. If this is not possible, then letters from supervisors or from individuals that can assess your intellectual aptitude for a graduate program will be sufficient.

7. A writing sample such as a full length research paper. The writing sample may be in the form of a sole-authored academic paper, published article, professional proposal, evaluation, or report. The ideal writing sample demonstrates both your writing and analytical abilities. It should have a clearly articulated thesis statement and make an argument that analyzes the topic, rather than just describing it. There is no required length for the writing sample.

8. English Language Proficiency exam scores (required for international applicants) – TOEFL: minimum score of 600 (paper-based), 250 (computer-based), or 100 (internet-based.) **Please note that students submitting internet-based exam results must earn a minimum score of 23 on each individual exam section. IELTS: minimum total score of 6.5. An official score report is required. In addition, students may be required to be tested by the GMU English Language Institute.


Application Deadlines: Fall (August matriculation) Deadline: December 1 (November 1 for International Applicants)

Please upload application materials (including all unofficial transcripts, writing samples, resume, and goals statement) to your Self Service Center. If admitted, official hard-copy transcripts can be mailed to:

GMU-Office of Graduate Admissions
4400 University Drive, MS 4C8
Fairfax, VA 22030
**Graduate Tuition and Fees for 2018-2019 (subject to change):**

- **In-state** graduate tuition and fees: $689.00 /per credit hour
- **Out-of-state** graduate tuition and fees: $1,446.75/per credit hour

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**Financial Aid - George Mason University Federal Title IV School Code: 003749**

To determine if you are eligible for financial aid and to establish eligibility for alternative financial aid resources, you must apply each year. For more information visit the [Mason Financial Aid website: http://financialaid.gmu.edu](http://financialaid.gmu.edu)

1. **Complete the Free Application for Federal Student Aid (FAFSA) or Renewal FAFSA Application as soon as possible after January 1.** You do not have to be admitted to a degree program to complete the FAFSA application.

You may also use the electronic FAFSA Express software to submit your application electronically. Applications received by the processing center after March 1st for the next academic year are considered late and cannot be given priority consideration. Financial aid applications must be received by the federal processor by March 1 to be considered on-time.

You may complete the FAFSA using ESTIMATED income and tax figures. If necessary, do this rather than missing the priority filing date. Be prepared to provide complete copies of your Federal tax returns, tax schedules, and W-2 forms if requested.

2. Approximately 4-6 weeks after you mail the application you will receive a **Student Aid Report (SAR).** You must review it, make appropriate corrections, sign it and send Part 2 back to the federal processor.

3. If additional information is required to process your file, you will receive a **Missing Information Letter from the Office of Student Financial Aid.** You should respond to this request as quickly as possible. Failure to respond in a timely manner can drastically affect the amount of aid that you are offered.

4. After all information is received by the Financial Aid Office you will receive an award offer notification by email. This will include the types and amounts of aid you are offered.
School Graduate Enrollment Profile – Fall 2018

Total Enrollment: 955
Ph.D. Enrollment 145
Master’s and Certificate Enrollment 781
Non-Degree Enrollment 29

Gender: 48% Male
52% Female

Enrollment Status: 32% Full-time
68% Part-time

Domicile*: 74% In-State
26% Out-of-State

Ethnicity: 28% Minority**
8% Non- Resident Alien

Graduate Application/Student Profile – Fall 2018

PH.D.s IN BIODEFENSE, POLITICAL SCIENCE, AND PUBLIC POLICY

Newly Enrolled Students: 13
Applications Received: 107
Admitted Students Mean GPA – Master’s Degree: 3.73
Admitted Students Mean GPA – Undergraduate Degree: 3.46

Admitted Students GRE – Mean Percentiles:
Quantitative 65%
Verbal 78%
Analytical Writing 72%

*Domicile reflects tuition rate designation, not necessarily state of residency.
**Includes those students who identify themselves as African American, Asian, Hispanic, Native American or Pacific Islander.