IAFF 6158
Artificial Intelligence & Policy Challenges
Syllabus

Course Details

Modality: In-Person
Class Time: Wednesday, 5:10 pm – 7:00 pm
Class Location: Monroe 113

Course Description & Goals

This class examines artificial intelligence (AI), problems of various sorts that AI use can cause, and candidate policy frameworks to manage these problems. No prior technical knowledge of artificial intelligence is needed to be successful in the class. The class examines problems in both the international and the domestic context; in each context, the class considers both technical problems and normative problems that arise from the use of artificial intelligence. Technical problems arise from using data sets to train AI algorithms that are unrepresentative of the relevant population, for example. Normative problems arise from various debates over new capabilities enabled by AI algorithms, including what constitutes “legitimate” heritable human genome editing, strategic stability in the military balance between great powers, “killer” robots, personal privacy, or equity between different groups within a society. In the international context, the class examines purposeful manipulation of genomes and AI-enabled military capabilities. It will examine historical examples of non-proliferation norms and treaties and consider whether similar norms or treaties could be used to manage these AI-related problems in the international context. In the domestic context, the class will examine the vulnerability of AI to incorporate systemic bias and to enable the construction of a surveillance state. The class will examine the comparative policy frameworks within the United States, the European Union, and China and evaluate their strengths and weaknesses for mitigating policy challenges in the domestic context.
Learning Outcomes & Objectives

By the end of this course,

- Students will learn at a general level how artificial intelligence works.
- Students will learn about common technical mistakes in AI and how to identify and mitigate them.
- Students will learn about major policy issues related to the application of AI.
- Students will learn about classic nonproliferation norms and treaties.
- Students will learn about the policy frameworks to govern the use of AI algorithms and their application in the United States, the European Union, and China.
- Students will sharpen their ability to summarize, present, and evaluate arguments in both verbal and written contexts.

Required Book

The following book should be purchased.


Class Schedule and Assigned Readings

Week One – Wednesday, Aug 31

Objective:

- Provide an overview of artificial intelligence and of the class

Readings:

- None

Week Two – Wednesday, September 7
Objective:

• Examine a use of AI and discuss the sources of various problems it contains

Readings:

• Tate Ryan-Mosley, “I asked an AI to tell me how beautiful I am,” MIT Technology Review, March 5, 2021, https://www.technologyreview.com/2021/03/05/1020133/ai-algorithm-rate-beauty-score-attractive-face/


• Please Watch: Stanford Graduate School of Business, “Andrew Ng: Artificial Intelligence is the New Electricity,” Feb 3, 2017, Youtube, https://www.youtube.com/watch?v=21EiKfQYZXc


Week Three – Wednesday, September 14

Objective:

• Introduce Purposeful Genomic Manipulation, particularly for “useful molecules”
• Investigate specific “useful molecules” and discuss

Readings:


• Please Watch: “Using genomics to predict disease risk,” Broad Institute website (“Broad” here is pronounced so it rhymes with “Road”). https://www.broadinstitute.org/developing-diagnostics-and-treatments/using-genomics-to-predict-disease-risk#top

• Please Watch: MIT Open Course Ware, MIT Lincoln Laboratory, “1. Artificial Intelligence and Machine Learning,” Jun 25, 2020, Youtube, https://www.youtube.com/watch?v=t4K6lney7Zw

Week Four – Wednesday, September 21

Graded Items:

• One-pager (single-spaced) due Mon, Sept 19; two comments on Wed, Sept 21, 4:59 pm

Objectives:

• Discuss alternative strategies for managing problems
• Consider policy implications of Heritable Human Genome Engineering (HHGE)

Readings:


• Antonio Regalado, “China’s CRISPR babies: Read exclusive excerpts from the unseen original research,” MIT Technology Review, Dec 3, 2019.

Week Five – Wednesday, September 28

Graded Items:

• In-class Quiz
• Participation in pro/con on HHGE

Objectives:

• Use quiz to assess understanding of basic concepts about Artificial intelligence
• Hold pro/con on HHGE

Readings:

• None

Week Six – Wednesday, October 5

Objective:

• Evaluate whether broad conclusions can be made about AI-enabled military capabilities generally causing deterrence model or spiral model problems
• Identify different types of missions for which AI-enabled capabilities are suited and consider whether the risk of deterrence model or spiral model problems varies between mission type

Readings:


• Elliot Ackerman, "A Navy SEAL, A Quadcopter, and a Quest to Save Lives in Combat," Wired, 10.30.2020


Week Seven – Wednesday, October 12

Graded Assignment:

• One-pager (single-spaced) due Mon, Oct 10 and two comments due on Wen, Oct 12 at 4:59 p.m.

Objective:

• Evaluate arguments for and against creation and deployment of killer robots; and
• Consider whether historical tools could help manage this problem

Readings:

• Watch “Sci-Fi Short Film: ‘Slaughter Bots’” on Youtube. https://www.youtube.com/watch?v=O-2tpwW0kmU; Review autonomousweapons.org website

• Hitoshi Nasu and Colonel Christopher Korpela, Blog Post, “Stop the ‘Stop the Killer Robot’ Debate: Why We Need Artificial Intelligence in Future Battlefields,’” from Net Politics and Digital and


Week Eight – Wednesday, October 19

Graded Assignment:

- Pro/Con discussion on Killer Robots in class

Objective:

- Discuss sources of errors
- Have pro-con discussion on killer robots

Readings:


- Will Knight, “The fog of AI war: Militaries are Desperate to make use of AI-Based Weapons and Tools, but these are vulnerable to a very different kind of Attack,” MIT Technology Review, Nov/Dec 2019, pages 44 – 47.


Week Nine – Wednesday, October 26

Graded Assignment:

• Take home mid-term exam (five pages double-spaced) is due on Blackboard Fri, Oct 21 at 11:59.

Objective:

• Discuss sources of systemic bias

Reading:


Week Ten – Wednesday, November 2

Graded Assignment:

• Group Presentation in class with slides

Objective:

• Receive Student presentations on different types of technical problems, using the taxonomy in the Silva and Kenney article.

Readings:


Week Eleven – Wednesday, November 9

Graded Assignment:

• Quiz in class

Objective:

• Compare and contrast the policy frameworks for the use of data and AI in the United States, the European Union, and China

Readings:


Week Twelve – Wednesday, November 16 (No class on Wed, Nov 23)

Objective:

• Look closely at some perverse effects of the lack of a policy framework in the United States

Readings:


• “NSA Spying” Electronic Frontier Foundation, [https://www.eff.org/nsa-spying](https://www.eff.org/nsa-spying)


• Nathan Sheard and Adam Schwartz, “The Movement to Ban Government Use of Face Recognition,” May 5, 2022, Electronic Frontier Foundation, [https://www.eff.org/deeplinks/2022/05/movement-ban-government-use-face](https://www.eff.org/deeplinks/2022/05/movement-ban-government-use-face)
• Hayley Tsukayama, Adam Schwartz, India McKinney, and Lee Then, “Americans Deserve More than the Current American Data Privacy Protection Act,” July 24, 2022, Electronic Frontier Foundation


Week Thirteen – Wednesday, November 30
Graded Assignments:
• Pro/Con discussion

Objective:
• Participate in Pro/Con discussion on “Should the U.S. adopt policies like the EU’s GDPR?”
• Consider the full scope of an appropriate national policy framework

Readings:

Week Fourteen – (Last Class) Wednesday, December 7
Objective:
• Participate in concluding discussion
Readings:

- tbd

*Take home final exam (10 double-spaced pages) due – Wednesday, Dec 14 at 11:59 pm*
## Calendar for Assignments and Calculation of Final Grade

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DUE DATE</th>
<th>ITEM</th>
<th>TURN-IN SITE</th>
<th>PERCENT OF FINAL GRADE</th>
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</thead>
<tbody>
<tr>
<td>All Weeks</td>
<td>n/a</td>
<td>Class Participation</td>
<td>n/a</td>
<td>10%</td>
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<tr>
<td>Week 4</td>
<td>Mon, Sept 19 11:59 pm</td>
<td>One-pager (single-spaced)</td>
<td>Blackboard</td>
<td>10%</td>
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<td></td>
<td></td>
<td>(Average of one-pagers and comments)</td>
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<tr>
<td>Week 4</td>
<td>Wens, Sept 21 4:59 pm</td>
<td>Two comments on one-pager</td>
<td>Blackboard</td>
<td></td>
</tr>
<tr>
<td>Week 5</td>
<td>Wens, Sep 28</td>
<td>Quiz</td>
<td>In class</td>
<td>20%</td>
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<tr>
<td></td>
<td></td>
<td>(Average of 3 Quizzes)</td>
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<tr>
<td>Week 5</td>
<td>Wens, Sept 28</td>
<td>Pro/Con on HHGE</td>
<td>In class</td>
<td>15%</td>
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<tr>
<td></td>
<td></td>
<td>(Average of Pro-Con Participation)</td>
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<tr>
<td>Week 6</td>
<td>Wens, Oct 5</td>
<td>Quiz</td>
<td>In class</td>
<td></td>
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<tr>
<td>Week 7</td>
<td>Mon, Oct 10 11:59 pm</td>
<td>One-pager (single-spaced)</td>
<td>Blackboard</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>Wens, Oct 12 4:59 pm</td>
<td>Two comments on one-pager</td>
<td>Blackboard</td>
<td></td>
</tr>
<tr>
<td>Week 8</td>
<td>Wens, Oct 19</td>
<td>Pro/Con on Killer Robots</td>
<td>In class</td>
<td></td>
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<tr>
<td>Week 9</td>
<td>Fri, Oct 21, 11:59</td>
<td>Take home midterm exam (five-pages double-spaced)</td>
<td>Blackboard</td>
<td>15%</td>
</tr>
<tr>
<td>Week 10</td>
<td>Wens, Nov 2</td>
<td>Group Presentation with slides</td>
<td>In class; post slides in Blackboard</td>
<td>10%</td>
</tr>
<tr>
<td>Week 11</td>
<td>Wens, Nov 9</td>
<td>Quiz</td>
<td>In class</td>
<td></td>
</tr>
<tr>
<td>Week 13</td>
<td>Wens, Nov 30</td>
<td>Pro/Con on US/GDPR</td>
<td>In class</td>
<td></td>
</tr>
<tr>
<td>Finals</td>
<td>Wens, Dec 14 11:59</td>
<td>Take home final exam (ten-pages double-spaced)</td>
<td>Blackboard</td>
<td>20%</td>
</tr>
</tbody>
</table>
Class Participation

Students need to do the reading and actively engage with the ideas through participating in class discussions. Every student should expect to share a question, comment, or observation for each class meeting with discussion. The professor will keep notes about a student’s participation to inform this grade.

Each student needs to communicate in advance with the professor about planned absences or late arrivals from class sessions. Unexcused absences or late arrivals will count against your class participation grade.

Every student must schedule a 20-minute discussion in the first three weeks of the class with the professor for an informal discussion about your objectives for the class and your academic background.

Check the announcements page regularly for updates.

Overview of One-Pagers

The objective of the one-pagers is to build knowledge of various strategies that managed similar public policy problems in the past.

Let me acknowledge at the outset that these historical strategies may not be particularly helpful to manage the policy challenges introduced by Artificial Intelligence. A structured assessment of how and why these historical strategies worked, even imperfectly, can help make our thinking about possible future strategies more precise. When I use the term “strategy” in this context, I mean nonproliferation and arms control efforts like the Nuclear Non-Proliferation Treaty, the Biological Weapons Convention, and the Ottawa Treaty on Landmines. The process for one-pagers is as follows:

1. **Sign up** to write a one-pager on a particular strategy in class. I will post the assignments in an announcement after the class sign-up.
2. **Research the strategy.** Sometimes, there is a particular article to read about the strategy. These can be found in the “Public Policy Strategies” module on the Blackboard. If there is a specific article specified, read that article. If not, research the topic in the George Washington Library website (JSTOR is a good
search tool) or on the internet (using your well-honed skills to discern a quality web-site as opposed to a questionable one).

3. Draft a single spaced one-pager using the following outline:
   o Background Paragraph describing the strategy
   o Core Mechanism of the strategy
   o Enabling Conditions for the success of the strategy
   o Assessment of the extent to which the strategy achieved its avowed goal

4. Post one-pager in the discussion board by the end of the specified day

5. Comment on two classmate’s one-pagers before class on the specified day. Comments should consider the strengths and weaknesses of applying the strategy to the AI challenges under discussion

6. Actively participate in small-discussion group discussion on candidate strategies in class

Definitions:

The Core Mechanism is a short description, in general terms, of how the tactic or strategy worked. Rise above the specific issue (semiconductors, biological weapons, et al) to describe the structure of the mechanism in universal terms. For example, the core mechanism of the Nuclear Non-Proliferation Treaty could be that technologically advanced states agreed to provide dual use technology to less-advanced countries in exchange for the receiving countries agreeing to inspections to assure they are not diverting the technology from civilian to military purposes.

Enabling Conditions make possible the effectiveness of the tactic or strategy. They could include, for example, characteristics of the technology (for example, low entry costs or significant differences between military or civilian use of the technology); of the organization (military organizations have cultural prohibitions against innovation); or of the strategic environment (for example, agreement about the shared security threat or the presence of the U.S. security umbrella).

Pro/Con Discussions

Students will be randomly assigned to a side in a policy debate. The resulting student teams will participate in a class debate arguing in favor of their assigned position. There will be no presumption that students actually hold the position that they were assigned to argue. There will be time after the set-piece debate for students to identify strengths and weaknesses that particularly struck them in the context of the formal debate.

In-Class Quizzes

There will be three in-class quizzes. At least one week before the quiz, the topics that will be on the quiz will be identified. The questions will be relatively straight-forward recitation of data.
Mid Term and Final Exam

Both the mid-term and the final exam will be take-home exams. One week before the exam is due you will be given a list of essay questions. The exams will go beyond data to ask students to make judgements, draw conclusions, and provide recommendations.

The mid-term response should be a total of five double-spaced pages with the text in 12 pt font. The final exam should be a total of 10 double-spaced pages with the text in 12 pt font.

Your papers should be written in proper English and without grammatical errors. Please avoid technical jargon. All work should be original and new. Sources should be properly cited.

Credit Hour Policy

- In this 3 credit graduate course students are expected to work for 450 minutes per week (this includes 100 minutes of time spent in class per week); totaling to 112.5 hours of work over the duration of this 15-week semester.

Prerequisites

Academic

There are no prerequisites.

Technological

As an online student, it is necessary to possess baseline technology skills in order to participate fully in the course. Please consult the GW Online website for further information about recommended configurations and support. If you have questions or problems with technology for this course, please consult the Technology Help link in the left navigation menu in our course in Blackboard.

You should be able to:

- Use a personal computer and its peripherals.
- Use word processing and other productivity software.
- Use the webcam and microphone on your device.
- Use your computer to upload recordings and images to your computer.
- Seek technology help by contacting GW Information Technology (202-994-4948).
If you have any problems with the software in this course, please reference the Technology Help link in the left navigation menu in our course on Blackboard.

**Grading Scale**

Grading Scale (example for graduate courses)

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Low Pass</th>
<th>Fail</th>
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</thead>
<tbody>
<tr>
<td>A 96%-100%</td>
<td>B+ 87%-89%</td>
<td>B- 80%-83%</td>
<td>C 74%-76%</td>
<td>F Under 70%</td>
</tr>
<tr>
<td>A- 90%-95%</td>
<td>B 84%-86%</td>
<td>C+ 77%-79%</td>
<td>C- 70%-73%</td>
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**Policies**

**Incomplete Grades**

At the option of the instructor, an Incomplete may be given for a course if a student, for reasons beyond the student’s control, is unable to complete the work of the course, and if the instructor is informed of, and approves, such reasons before the date when grades must be reported. An Incomplete can only be granted if the student’s prior performance and class attendance in the course have been satisfactory. Any failure to complete the work of a course that is not satisfactorily explained to the instructor before the date when grades must be turned in will be graded F, Failure.

If acceptable reasons are later presented to the instructor, the instructor may initiate a grade change to the symbol I, Incomplete. The work must be completed within the designated time period agreed upon by the instructor, student, and school, but no more than one calendar year from the end of the semester in which the course was taken. To record the exact expectations, conditions, and deadlines of the Incomplete please use the Elliott School’s Incomplete Grade Contract.

The completed and signed contract is to be submitted to the Academic Affairs and Student Services Office. All students who receive an Incomplete must maintain active student status during the subsequent semester(s) in which the work of the course is being completed. If not registered in other classes during this period, the student must register for continuous enrollment status. For more information regarding Incompletes, please visit the University Bulletin.
Instructor Response Time

I will respond to emails within 24 hours on weekdays and on the next business day over weekends and holidays.

I will return assignments within two weeks.

Statement on Inclusive Teaching

This class is committed to exercising inclusive teaching. Issues of systemic bias are embedded in data sets used to train artificial intelligence algorithms and this class seeks to understand this reality, among other AI-related problems. It strives to assure that assigned readings reflect diverse perspectives and that an environment is created in the class discussions that encourages and values the consideration of difficult issues from different perspectives.

Differences in time Zone

All the times in this Blackboard course correspond to the U.S. Eastern Time zone (e.g., Washington, DC). It is your responsibility to convert these times to the time zone of your location so that you can meet this course's deadlines.

Inclement Weather

Please note that online courses at the George Washington University will continue to be held even when the University is closed for inclement weather.

Late Work

Extensions must be requested and approved in e-mail prior to the due date of the assignment. There is a presumption that requests for an additional 48 hours for take-home assignments will be approved but please request the 48 hours before the original due date and time.

Students must notify the professor before class if they will miss an in-class quiz or pro-con discussion. If there is a compelling reason for missing the class, the professor may choose to not administer the re-test and simply make the assignment not count for the student or to provide an opportunity for a re-test.

GW Acceptable Use for Computing Systems and Services

All members of the George Washington University must read and comply with the Acceptable Use Policy when accessing and using computing systems and services, including email and Blackboard. Please read the Acceptable Use Policy to familiarize yourself with how GW information systems are to be used ethically.
Netiquette

Please observe the following rules of netiquette for communicating online:

- Remain professional, respectful, and courteous at all times.
- Remember that a real human being wrote each post and will read what you write in response. It is easy to misinterpret discussion posts. Let’s give the benefit of the doubt.
- If you have a strong opinion on a topic, it is acceptable to express it as long as it is not phrased as an attack. Please be gracious with differing opinions.
- When upset, wait a day or two prior to posting. Messages posted (or emailed) in anger are often regretted later.
- Proofread and use the spell check tool when you type a post. It makes the post easier to read and helps your readers understand what you are saying.

I reserve the right to delete any post that is deemed inappropriate for the discussion forum, blog, or wiki without prior notification to the student. This includes any post containing language that is offensive, rude, profane, racist, or hateful. Posts that are seriously off-topic or serve no purpose other than to vent frustration will also be removed.

Academic Integrity

Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.

Please review GW’s Policy on Academic Integrity. All graded work must be completed in accordance with the George Washington University Code of Academic Integrity. For more information, see Promoting Academic Integrity.

Sharing of Course Content

Unauthorized downloading, distributing, or sharing of any part of a recorded lecture or course materials, as well as using provided information for purposes other than the student’s own learning may be deemed a violation of GW’s Student Conduct Code.

Use of Student Work (FERPA)

The professor will use academic work that you complete during this semester for educational purposes in this course during this semester. Your registration and continued enrollment constitute your consent.

Copyright Policy Statement
Materials used in connection with this course may be subject to copyright protection under Title 17 of the United States Code. Under certain Fair Use circumstances specified by law, copies may be made for private study, scholarship, or research. Electronic copies should not be shared with unauthorized users. If a user fails to comply with Fair Use restrictions, he/she may be liable for copyright infringement. For more information, including Fair Use guidelines, see Libraries and Academic Innovations Copyright page.

Bias-Related Reporting

At the George Washington University, we believe that diversity and inclusion are crucial to an educational institution's pursuit of excellence in learning, research, and service. Acts of bias, hate, or discrimination are anathema to the university’s commitment to educating citizen leaders equipped to thrive and to serve in our increasingly diverse and global society. We strongly encourage students to report possible bias incidents. For additional information, please visit Bias Incident Response.

Disability Support Services & Accessibility

If you may need disability accommodations based on the potential impact of a disability, please register with Disability Support Services (DSS). If you have questions about disability accommodations, contact DSS at 202-994-8250 or dss@gwu.edu or visit them in person in Rome Hall, Suite 102. For additional information, please visit GW Disability Support Services.

For information about how the course technology is accessible to all learners, see the following resources:

- Blackboard accessibility
- Kaltura (video platform) accessibility
- Voicethread accessibility
- Microsoft Office accessibility
- Adobe accessibility

Religious Observances

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, please see GW’s Policy on Religious Observances.

Counseling and Psychological Services

The University's Counseling and Psychological Services office offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and
referrals. For additional information, call 202-994-5300 or visit GW’s Counseling and Psychological Services office.

Emergency Preparedness and Response Procedures

The University has asked all faculty to inform students of these procedures, prepared by the GW Office of Public Safety and Emergency Management in collaboration with the Office of the Executive Vice President for Academic Affairs.

To Report an Emergency or Suspicious Activity

Call the University Police Department at 202-994-6111 (Foggy Bottom) or 202-242-6111 (Mount Vernon).

Shelter in Place – General Guidance

Although it is unlikely that we will ever need to shelter in place, it is helpful to know what to do just in case. No matter where you are, the basic steps of shelter in place will generally remain the same.

■ If you are inside, stay where you are unless the building you are in is affected. If it is affected, you should evacuate. If you are outdoors, proceed into the closest building or follow instructions from emergency personnel on the scene.
■ Locate an interior room to shelter inside. If possible, it should be above ground level and have the fewest number of windows. If sheltering in a room with windows, move away from the windows. If there is a large group of people inside a particular building, several rooms may be necessary.
■ Shut and lock all windows (for a tighter seal) and close exterior doors.
■ Turn off air conditioners, heaters, and fans. Close vents to ventilation systems as you are able. (University staff will turn off ventilation systems as quickly as possible).
■ Make a list of the people with you and ask someone to call the list in to UPD so they know where you are sheltering and who is with you. If only students are present, one of the students should call in the list.
■ Await further instructions. If possible, visit GW Campus Advisories for incident updates or call the GW Information Line 202-994-5050.
■ Make yourself comfortable and look after one other. You will get word as soon as it is safe to come out.

Evacuation

An evacuation will be considered if the building we are in is affected or we must move to a location of greater safety. We will always evacuate if the fire alarm sounds. In the event of an evacuation, please gather your personal belongings quickly (purse, keys, GWorld card, etc.) and proceed to the nearest exit. Every classroom has a map at the door designating both the shortest egress and an alternate egress. Anyone who is physically unable to walk down the stairs should wait in the stairwell, behind the closed doors. Firemen will check the stairwells upon entering the building.
Once you have evacuated the building, proceed to our primary rendezvous location: the court yard area between the GW Hospital and Ross Hall. In the event that this location is unavailable, we will meet on the ground level of the Visitors Parking Garage (1 Street entrance, at 22nd Street). From our rendezvous location, we will await instructions to re-enter the School.

Alert DC

Alert DC provides free notification by e-mail or text message during an emergency. Visit GW Campus Advisories for a link and instructions on how to sign up for alerts pertaining to GW. If you receive an Alert DC notification during class, you are encouraged to share the information immediately.

GW Alert

GW Alert provides popup notification to desktop and laptop computers during an emergency. In the event that we receive an alert to the computer in our classroom, we will follow the instructions given. You are also encouraged to download this application to your personal computer. Visit GW Campus Advisories to learn how.

Additional Information

Additional information about emergency preparedness and response at GW or the University’s operating status can be found on GW Campus Advisories or by calling the GW Information Line at 202-994-5050.