



**TEXAS A&M**  
**UNIVERSITY**  
**CENTRAL TEXAS**

**POLI 4320:**  
**Weapons of Mass Destruction**  
**Section 115, CRN 60180, Summer 2023**  
**8-Week Face to Face (June 6-July 27)**  
**2 PM-5 PM Tues/Thurs in HH 309**



**Dr. Jeffrey Dixon**

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**Office Hours:** 5:10 PM-6:30 PM Tu/Th  
and 4:30 PM-5:45 PM Mo/Wed

**Course Description**

Examine the physical and political consequences of chemical, biological, and nuclear weapons, with emphasis on issues of nuclear deterrence and arms control.

**Warning – Graphic Images**

The study of WMD includes the study of their effects. In some early parts of this class, we will be examining some graphic photos of WMD casualties – people with blisters, diseases, burns, and radiation poisoning. These images are essentially *political* in function – they are part of the reason that the world treats WMD differently from other weapons. They are not presented for their shock value but rather as information about the visible effects of each weapon of mass destruction on the human body.

**Course Overview**

This course focuses on chemical, biological, and nuclear weapons. The effects of attacks using each type of weapon will be simulated; we will also cover the military doctrine, international law, and politics of each of these weapons. Special emphasis is placed on the uniqueness of nuclear weapons, including nuclear deterrence and nuclear arms control.

**Course Outcomes and Learning Objectives**

The core objective of this class is to enable students to answer the following central questions about the politics of weapons of mass destruction (WMD). At the end of the course, students should be able to provide a well-supported answer to each of the following with respect to chemical weapons (Unit I), biological weapons (Unit II), and/or nuclear weapons (Unit III):

1. What are such weapons, and in what ways – and why -- do international laws and international institutions treat them differently from other weapons?
2. How does the possession of these weapons by nations or their adversaries affect the decisions that those nations make, especially those embodied in military doctrine and crisis behavior?
3. When and under what circumstances are these weapons likely to be used, and what are the likely consequences of their use?

*Learning Objectives:* At the end of the course, students should be able to answer each question about chemical (Learning Objectives 1-3), biological (Learning Objectives 4-6), and/or nuclear (Learning Objectives 7-9) weapons. These objectives (outcomes) are introduced by readings and lectures, reinforced and assessed by exercises and memos, and assessed in greater detail on the final exam.

### **Course Format**

This course meets face-to-face, with videos and other supplemental materials made available online through the Texas A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com>].

### **Required Readings**

The following books are required for this course. Note that a student is under no obligation to purchase textbooks from the university bookstore. Other sources, including online retailers, may offer lower prices. Do pay careful attention to delivery dates so that you have each book on time. All other required readings and the required films/videos may be found on Canvas.

Lawrence Freedman and Jeffrey Michaels. 2019. *The Evolution of Nuclear Strategy*. 4<sup>th</sup> Ed. NY: Palgrave MacMillan. ISBN 9781137573490.

James J. Wirtz and Jeffrey Arthur Larsen (eds). 2022. *Nuclear Command, Control, and Communications: A Primer on US Systems and Future Challenges*. Washington, DC: Georgetown University Press. ISBN 9781647122447.

### **Technology Requirements**

This course will use the Texas A&M-Central Texas Instructure Canvas learning management system. We strongly recommend the latest versions of Chrome, Firefox, Edge, or Safari browsers. Canvas will run on Windows, Mac, Linus, iOS, android, or any other device with a modern web browser. **Canvas no longer supports any version of Internet Explorer.**

Logon to Texas A&M-Central Texas Canvas [<https://tamuct.instructure.com/>] or access Canvas through the TAMUCT Online link in myCT [<https://tamuct.onecampus.com/>] by clicking on the “TAMUCT Online Canvas” tile. You will then log in through our Microsoft portal.

Username: Your MyCT email address. Password: Your MyCT password

Additional requirements:

- Everything is tested using the free Google Chrome web browser, but should also work with most modern web browser, except for the fact that **Internet Explorer is not supported by Canvas**.
- You will need the ability to watch streaming videos on Canvas, which requires broadband internet access. This does not require you to install specific video software -- if you can watch videos on sites like YouTube, you should be able to watch the course videos without issue.
- You will need to be able to open Portable Document Files (for readings posted on Canvas). Adobe Reader can do this for free and may be downloaded from [<https://get.adobe.com/reader/>]
- You will also need to use Microsoft Excel (or Google Sheets, freely available online at [<https://sheets.google.com/>]) to complete parts of one homework exercise.
- You may wish to be able to view the Microsoft PowerPoint files which provide the basis for most lecture material. Besides PowerPoint, the free Google Slides program [<https://docs.google.com/presentation/u/0/>] can open these. If you cannot gain access to a program which can open these, I can post them in pdf format as well.

## Canvas Support

Use the Canvas Help tab, located at the bottom of the left-hand menu, for issues with Canvas. You can search the support articles or use the Email, Call, or Chat buttons at the bottom of the support pop-up to contact the Canvas Help Desk. **For issues related to course content and requirements, contact your instructor.**

## Other Technology Support

For log-in problems, students should contact Help Desk Central, 24 hours a day, 7 days a week:

Email: [helpdesk@tamu.edu](mailto:helpdesk@tamu.edu)

Phone: (254) 519-5466

[Web Chat](http://hdc.tamu.edu): [http://hdc.tamu.edu]

*Please let the support technician know you are an A&M-Central Texas student.*

## Student-Instructor Interaction

I check email at least once every weekday and less frequently on weekends. If you request a reply, I try to send one within 24 hours of reading your email. In general, emailing an assignment can demonstrate you had it done before it was due, but **emailed assignments won't be graded** until you hand in a paper copy.

## Grading (90/80/70/60):

- *Academic Integrity Exercise (Needed to Pass):* This consists of watching a brief lecture, taking a quiz, seeing where any mistakes on the quiz came from, and signing a statement. Once you successfully complete this exercise, you will no longer need to do so in future political science courses. *If you have already completed this exercise in one of my other courses, you need not do so again for this course.*

**\*\*\*Completing the Academic Integrity Exercise is a prerequisite to passing this course. It must be completed before submitting homework.\*\*\***

- **Rubric: You will fail the course if you have not completed the Academic Integrity exercise on or before its due date.**
- In-Class Simulations (14%): In each of these, your credit is determined by whether you submitted the required preparatory work on time and either the degree to which you interacted with other members of your group or the degree to which you interacted with other groups (if you have the role of diplomat). I expect that people who are on time with everything and do some relevant talking on within and between groups will receive full credit.
- Final Exam (25%). The final exam will have 45 multiple-choice questions, followed by one essay question. The essay and the multiple-choice section each count for half of the credit. You will be permitted to use your readings and notes on the exam, but it is timed (3 hours total).
  - The essay question (50% of the credit) will be drawn from Questions 1, 2, or 3 on the syllabus and cover **either** chemical and biological weapons (CBW) **or** nuclear weapons. There are thus six possible questions for which you should prepare, one of which will appear on the final. It will be up to you to make relevant distinctions between the different subtypes of WMD (such as BW vs. CW), where necessary in your answer.

## POLI 4320 Final Exam Essay Rubric

Grade	Thesis (15%)	Argument Structure (15%)	Evidence from Films, Readings, and Lectures (70%)
<b>A</b>	Answers the question and drives the rest of the essay	The thesis is built up from arguments about each element of the question, each with its own support	Each element of the argument is supported by evidence from the course. In general, consistent statistical findings are better evidence than isolated examples, where such evidence is available. No major source of evidence is ignored (including counter-evidence, which is addressed and shown to be less compelling or more flawed than the evidence supporting the thesis).
<b>B</b>	Answers the question, but most of the paper ignores it	Some elements of the thesis do not correspond to sections of the answer, or vice versa	Each element of the argument is supported by evidence from the course, but major sources of evidence are ignored. OR The evidence used is insufficient to support one or more of the claims in the paper. OR Much of the support consists of direct quotes or naked claims, unsupported by research.
<b>C</b>	Does not match up with every element of the question	The essay is a set of arguments that proceed without logical order	The evidence, when taken as a whole, fails to support the paper's thesis, with necessary steps in the argument being assumed instead of demonstrated. Much relevant evidence is omitted and irrelevant evidence may be present. References to evidence from the course lack specificity.
<b>D</b>	Does not match up with most elements of the question	Most of the essay is devoid of actual argument, instead following a "data dump" strategy	At least one major element of the essay's argument has substantial evidence from the course that supports it. However, other references are generally vague, irrelevant, or refuted by counter-evidence from other studies.
<b>F</b>	None	The essay is devoid of structure	Little if any evidence from the course is used in the answer. It fails to demonstrate a grasp of what the authors found.

- Assignments (60%). There are three types of assignments:
  - Memos. A memo is a brief (roughly 500 words) essay responding to the topic or question presented for the particular lesson. Your memo should show that you read and watched the assigned materials for the lesson. It should contain a clear thesis and supporting evidence. It should primarily rely on the course materials, but if you do use information from an outside source, be sure to include an APSA-style, in-text, parenthetical citation and a works cited page.

- Rubric:

### POLI 4320 Memo Grading Rubric

Grade	Thesis (25%)	Argument Structure (25%)	Evidence (50%)
A	Answers the question and drives the rest of the essay	The thesis is built up from arguments about each element of the question, each with its own support	Each element of the argument is supported by evidence from the assigned material and no major evidence is ignored. In general, consistent statistical findings are better evidence than isolated examples, where such evidence is available.
B	Answers the question, but most of the paper ignores it	Some elements of the thesis do not correspond to sections of the answer, or vice versa	Each element of the argument is supported by evidence, but <b>either</b> major sources of evidence in the assigned material are ignored <b>or</b> the evidence used is insufficient to support one or more of the claims in the paper.
C	Does not match up with every element of the question	The essay is a set of arguments that proceed without logical order	The evidence, when taken as a whole, fails to support the paper's thesis, with necessary steps in the argument being assumed instead of demonstrated. Much relevant evidence is omitted and much of the support consists of direct quotes or naked claims, unsupported by the empirical evidence.
D	Does not match up with most elements of the question	Most of the essay is devoid of actual argument, instead following a stream-of-consciousness or "data dump" strategy	At least one major element of the essay's argument has substantial evidence from the relevant assigned material that supports it. However, the other elements are supported by generally vague, irrelevant, or naked claims.
F	None	The essay is devoid of structure	Little if any evidence from the assigned material is used in the answer. It fails to synthesize any research.

- Exercises. These tend to be more interactive and more extensive than memos. Each comes with its own set of instructions and point rubric (see the final section of this syllabus).
- Survey: There is an opinion survey on the first day of class. You are graded on *whether you responded to it*, not on whether you had the "right" opinions. Some of this "public opinion"/"course opinion" data (at the class level, not the individual level) will be used in some lectures later in the course.
- **Regrades:** If you think I have graded part or all of an assignment incorrectly, feel free to ask for a regrade against the rubric. You have *one week* from when the grade posts in Canvas Gradebook to request a regrade of some or all of the exercise. Just send an email specifying the section(s) you want regraded, and (optionally) why you want it regraded. I will compare it to the rubric again. I do not take offense at such requests if they are timely made.

# POLI 4320 Course Rubric

Category	Item	Points	Percent
Special	Academic Integrity Exercise	0 (but required to pass the course)	0%*
Participation	Simulations (2)	85 each (170 total)	17%
Assignments	Survey on WMD and Ethics	30	3%
	Memos (8)	30 each (240 total)	24%
	In-Class Exercises (4)	60 each (240 total)	24%
	India-Pakistan Stability Exercise	50	5%
	Risk Evaluation Exercise	30	3%
	US-Soviet Crisis Exercise	40	4%
Exam	Final Exam	100 per question (200 total)	20%
<b>TOTAL POSSIBLE</b>		<b>1000</b>	<b>100%</b>
		<b>895+ = A    795-894=B    695-794=C    595-694=D    594 or lower = F</b>	

## Lectures

It is exceedingly difficult to do well without a good set of lecture notes – and the PowerPoint files I post don't include the explanations I provide and the brief video clips incorporated into most actual lectures. The lectures do **not** simply rehash the readings – they are mostly new material that helps you organize the evidence presented in the assigned readings. The “downside” to this is that you need both a good set of lecture notes and careful examination of the assigned readings to do well in the course (on both memos/exercises and the final exam).

## Course Policies

### Deadlines and Late Work

- Late submissions lose 20% of their credit each calendar day (not just each class session) that they are late.
  - Exception: The final exam *cannot* be turned in for credit after its due deadline (which is the last day of summer 8-week classes).
- Make-up participation work is also required for each excused absence. Just make a 3-4 page typed outline of the major points and arguments from the readings for the session in addition to doing any assigned homework. You must also complete any in-class exercises you missed to get the credit for them.

### Posting of Grades

As soon as materials are graded, grades will be posted to the Canvas grade book. I strive to turn around most assignments within a week, but some may take a bit longer.

### Incompletes

Grades of incomplete are not to be used when students simply fall behind. Instead, they are used when some event such as a hospitalization or deployment effectively takes the student out of the class after the drop deadline. By university policy, incompletes must be finished in the subsequent semester.

## Academic Integrity

*University Code of Academic Honesty:* Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be referred to the Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

For more [information regarding the student conduct process](https://www.tamuct.edu/student-affairs/student-conduct.html), see the following link:  
[<https://www.tamuct.edu/student-affairs/student-conduct.html>].

If you know of potential honor violations by other students, you may [submit a referral](https://cm.maxient.com/reporting.php?TAMUCentralTexas),  
[<https://cm.maxient.com/reporting.php?TAMUCentralTexas>].

*Specific guidelines for this course, which supplement and do not replace University policy:*

- **Violations:** Some common violations of academic integrity that I have observed while teaching similar classes at TAMUCT are
  - **Most Common Violation:** Plagiarism. This comes in two varieties:
    - Use of direct quotes without quotation marks. Even if you are just using three- or four-word phrases, you need to surround them with quotation marks if you didn't create them yourself. This is true even if you cite the source! Remember that changing a few words in a sentence does not transform a direct quote into a paraphrase; instead, it transforms one long direct quote into several shorter direct quotes with a word of your own between each. A true paraphrase is the expression of the cited source's ideas in your own words.
    - Paraphrasing another person's words without citing the source
  - **Second Most Common Violation:** Receiving answers on any coursework from anyone other than the instructor. If you hand your work to someone else and they proceed to copy part or all of it, both of you will be deemed to have violated the policy. A single copied answer on an assignment is sufficient to trigger the policy.
- **Penalties:**
  - The normal penalty for a violation of academic integrity (whether or not it is specifically listed above) in any of my classes is a grade of zero for the work or a deduction of 20% (two letter grades) from your course grade, whichever is **greater**. The infraction will be reported to the TAMUCT administration, with a recommendation for probation in the case of deliberate violation or no further action in the case of clearly inadvertent violation.
  - The (a) outright purchase, download, or completion by others of an exam or assignment, or (b) second or subsequent violation of academic integrity (in this course or other courses) display such serious disregard for academic integrity that either one of them will result in course failure **and** recommendation for maximum disciplinary penalties to the TAMUCT administration.

## Drop Policy

If you discover that you need to drop this class, you must complete the [Drop Request](#) Dynamic Form through Warrior Web.

[<https://federation.ngwebsolutions.com/sp/startSSO.ping?PartnerIdpld=https://eis-prod.ec.tamuct.edu:443/samlSSO&SpSessionAuthnAdapterId=tamuctDF&TargetResource=https%3a%2f%2fdynamicforms.ngwebsolutions.com%2fSubmit%2fStart%2f53b8369e-0502-4f36-be43-f02a4202f612>]

Faculty cannot drop students; this is always the responsibility of the student. The Records and Admissions Office will provide a deadline on the Academic Calendar for which the form must be completed. Once you submit the completed form to the Records and Admissions Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Records and Admissions Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

## Title IX Rights and Reporting Responsibilities

A&M-Central Texas is committed to creating a safe and open learning environment for all students. If you or another student has experienced any form of gender discrimination or sexual misconduct, including sexual harassment, sexual assault, dating/domestic violence, and/or sex-based stalking, help and support are available. Our university strongly encourages all members of our campus community to report incidents and seek support for gender discrimination and sexual misconduct through the Title IX Office. You may contact the Title IX Office at 254.519.5716, [titleix@tamuct.edu](mailto:titleix@tamuct.edu), Founders Hall 317B, or learn more by visiting the [Title IX webpage](#) [<https://www.tamuct.edu/compliance/titleix.html>].

Please be aware that that under [Title IX](#), [Texas Senate Bill 212](#), and [System Regulation 08.01.01](#), [<https://policies.tamus.edu/08-01-01.pdf>] all university employees are mandated reporters and are required to disclose information about suspected or alleged violations as listed above and defined in System Regulation 08.01.01. If the Title IX Office receives information about an incident, they will reach out to offer information about resources, rights, and procedural options as a member of the campus community. Although I have an obligation to report, you will, in most cases, control how your case will be handled. When working with the Title IX Office you will have access to resources and accommodations but also have the opportunity to express if you wish to move forward with an investigation. Our goal is to make sure you are aware of the options available to you as a student. Community members are not required to respond to this outreach.

If you or another student wishes to speak to a confidential employee who does not have this reporting responsibility, you can contact the [Student Wellness & Counseling Center](#), [<https://www.tamuct.edu/student-affairs/student-counseling.html>], 254.501.5955, or [swacc@tamuct.edu](mailto:swacc@tamuct.edu), located in Warrior Hall Room 207L or the Student Support Advocate, 254.501.5978 or [ssa@tamuct.edu](mailto:ssa@tamuct.edu), located in founder Hall Room 317D.

## Student Resources

### Emergency Warning System for Texas A&M University – Central Texas (SAFEZONE):

. SafeZone provides a public safety application that gives you the ability to call for help with the push of a button. It also provides Texas A&M University-Central Texas the ability to communicate emergency information quickly via push notifications, email, and text messages. All students automatically receive email and text messages via their myCT accounts.

Downloading SafeZone allows access to push notifications and enables you to connect directly for help through the app.

You can download SafeZone from the app store and use your myCT credentials to log in. If you would like more information, you can visit the SafeZone website [[www.safezoneapp.com](http://www.safezoneapp.com)].

- To register SafeZone on your phone, please follow these 3 easy steps:
  1. Download the SafeZone App from your phone store using the link below:
    - iPhone/iPad: [<https://apps.apple.com/app/safezone/id533054756>]
    - Android Phone / Tablet  
[<https://play.google.com/store/apps/details?id=com.criticalarc.safezoneapp>]
  2. Launch the app and enter your myCT email address (e.g. {name}@tamuct.edu)
  3. Complete your profile and accept the terms of service

### COVID information:

For updates, please monitor the University website [<https://www.tamuct.edu/covid19/>]

### Academic Accommodations:

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier-free education. The Warrior Center for Student Success, Equity and Inclusion is responsible for ensuring that students with a disability receive equal access to the university's programs, services and activities. If you believe you have a disability requiring reasonable accommodations, please contact the Office of Access and Inclusion, WH-212; or call (254) 501-5836. Any information you provide is private and confidential and will be treated as such. For more information, please visit our Access & Inclusion Canvas page (log-in required) [<https://tamuct.instructure.com/courses/717>]

- **Pregnant and/or Parenting Students Rights and Accommodations:** Texas A&M University-Central Texas supports students who are pregnant, experiencing pregnancy-related conditions, and/or parenting. In accordance with requirements of [Title IX and related guidance from US Department of Education's Office of Civil Rights](#), the Associate Dean in the Division of Student Affairs, (254) 501-5909, can assist students who are pregnant, experiencing pregnancy-related conditions, and/or parenting by provide flexible and individualized reasonable accommodations. Students should seek out assistance as early in the pregnancy as possible through the [Pregnancy & Parenting webpage](#) [<https://www.tamuct.edu/student-affairs/pregnant-and-parenting-students.html>]. For more information, please visit [Student Affairs](#) [<https://www.tamuct.edu/student-affairs/pregnant-and-parenting-students.html>]. If you would like to read more about these [requirements and guidelines](#) online, please visit the website [<http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf>].
  - [Title IX of the Education Amendments Act of 1972](#) specifically prohibits discrimination against a student based on pregnancy, childbirth, false pregnancy, termination of pregnancy, or recovery from any of these conditions [<https://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.html>].
  - Students experiencing any form of discrimination due to any of these conditions are encouraged to reach out to the Title IX Coordinator, 254.519.5716, [titleix@tamuct.edu](mailto:titleix@tamuct.edu), Founders Hall 317B, or the Associate Dean of Student Affairs, 254.501.5909, Warrior Hall 105.

### Tutoring and Success Coaching:

Tutoring and success coaching services are available to all A&M-Central Texas students, both virtually and in-person.

- To schedule tutoring sessions or view tutor availability, please contact [Warriorcenter@tamuct.edu](mailto:Warriorcenter@tamuct.edu) or visit Warrior Hall, 111.
- If you have questions about these or other academic support services or are interested in becoming a tutor, please contact the Warrior Center for Student Success, Equity and Inclusion at (254) 501-5836, email us at [WarriorCenter@tamuct.edu](mailto:WarriorCenter@tamuct.edu). You are welcome to visit the Warrior Center at Warrior Hall, suite 212.
- *Chat live with a remote tutor 24/7 for almost any subject from on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log in and receive online tutoring support at no additional cost. This tool provides tutoring in over 40 subject areas except writing support. Access Tutor.com through Canvas.*

### University Library & Archives:

- The University Library & Archives provides many services in support of research across campus and at a distance. We offer over 350 electronic databases containing approximately 631,525 eBooks and 75,149 journals, in addition to the 97,443 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.
  - Research assistance from a librarian is also available 24 hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place virtually through WebEx, Microsoft Teams or in-person at the library. [Schedule an appointment here](https://tamuct.libcal.com/appointments) [https://tamuct.libcal.com/appointments]. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.
  - Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group workspaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](https://tamuct.libguides.com/index) [https://tamuct.libguides.com/index]

### University Writing Center:

- University Writing Center: For the summer semesters, all University Writing Center (UWC) tutoring services are entirely online. The hours of operation are from 10:00 a.m.-4:00 p.m. Monday through Thursday with additional hours Monday through Thursday nights from 6:00-9:00 p.m. The UWC is also offering hours from 12:00-3:00 p.m. on Saturdays.
  - Tutors are prepared to help writers of all levels and abilities at any stage of the writing process.
  - While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process.
  - In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides.

- Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the UWC is here to help!
- Students may arrange a one-to-one session with a trained and experienced writing tutor by making an appointment via [WCOOnline](https://tamuct.mywconline.com/) [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu) if you have any questions about the UWC, need any assistance with scheduling, or would like to schedule a recurring appointment with your favorite tutor.

**Important University Dates** (From <https://www.tamuct.edu/registrar/academic-calendar.html>)

June 30, 2022	Deadline for Scholarship Applications for the Fall Semester
July 1, 2022	School Counselor Program Application deadline (Fall)
July 22, 2022	Priority Deadline for VA Certification Request (Fall)
August 1, 2022	Summer Semester Admissions Application Opens
August 12, 2022	Priority Deadline for Admissions Applications

**Amendments**

Not all exigencies can be foreseen. I reserve the right to amend the syllabus at any time. Any such amendment will be provided to the students in writing in the form of a revised syllabus uploaded to Canvas.

**Copyright Notice**

Students should assume that all course *readings*, *videos* and *images* are copyrighted by their respective creator(s). Reproduction of such material is prohibited without consent from the creator of a work and verification of that permission by the course instructor. Violation of copyright is against the law and Texas A&M University-Central Texas’ Code of Academic Honesty. All alleged violations will be reported to the Office of Student Conduct.

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## Course Schedule

### Unit I: Do Chemical Weapons Belong in “WMD?”

#### June 6: The Politics of “Weapons of Mass Destruction” – Building a Threat

- A. In Class: Syllabus Review
- B. In Class: First Lecture (PowerPoint files are available on Canvas under the Files tab)

#### June 8: The Effects of Chemical Weapons on the Human Body

- A. Read: Course Syllabus (see Canvas: Files tab for a copy)
- B. Read: Salem, Ternay, and Smart, “Brief History and Use of Chemical Warfare Agents in Warfare and Terrorism” (see Files tab → Course Readings)
- C. DUE (if you have not previously completed the Academic Integrity Exercise for me in some other course): Academic Integrity Exercise (see Canvas: Assignments tab)
- D. In Class: Chemical Weapons Attack Exercise

#### June 13: Chemical Weapons Doctrine and Law

- A. Read: Sagan, “The Origins of Military Doctrine and Command and Control Systems”
- C. DUE: Online Survey on WMD and Ethics. Also: Indicate Preferences for top 3 countries/topics for later BWC and Crisis Simulations (all on Canvas: Quizzes tab).

### Unit II: Biosecurity

#### June 15: Biological Agents and Bioterror

- A. DUE: Memo 1 (Explaining CW Doctrine)

Which of our three perspectives is best supported and constitutes the best explanation for how states have constructed their chemical weapons doctrines, bearing in mind the various aspects of doctrine mentioned by Sagan and the three perspectives introduced in his article and heavily discussed in the lecture on June 13?

- B. In Class: Bioterrorism Exercise

#### June 20: Biological Warfare – Strategies, Doctrines, and Controls

- A. Watch: *The Living Weapon* (60 min)
- B. Read: Barras and Greub, “History of Biological Warfare and Bioterrorism”
- C. Read: Koblentz, “Offense, Defense, and Deterrence”
- D. Read: Lyon, “The COVID-19 Response Has Uncovered and Increased Our Vulnerability to Biological Warfare”
- E. (Recommended) Read: Koblentz, “Regime Security: A New Theory for Understanding the Proliferation of Chemical and Biological Weapons”

## June 22: The Biological and Toxin Weapons Convention 10<sup>th</sup> Review Conference: A Simulation

- A. Read: The assigned BWC “packet” of readings for your country (PRC, Russia, or the USA) (Roughly 81-89 pages, depending on your country).
- B. DUE: Memo 2 (Your assigned country’s BWC stances and priorities for the BWC) -- bring a second copy for your teammates.

Cover the topics listed at the end of the June 20 lecture -- e.g. whether anyone is currently violating the BWC and what your country’s position is on each major article of the BWC and why.

- C. In Class: 10<sup>th</sup> BWC Review Conference (Simulation)

## Unit III: Nuclear Weapons and Doctrines

### June 27: Introduction to Nuclear Weapons

- A. Read: Wirtz, Introduction and Chapter 1 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
- B. DUE: Memo 3 (Explaining BW Doctrine)

Which of our three perspectives is best supported and constitutes the best explanation for how states have constructed their biological weapons doctrines, bearing in mind the various aspects of doctrine mentioned by Sagan and the three perspectives introduced in his article, heavily discussed in the Chemical Weapons lectures, and revisited in the final Biological Weapons lecture?

- C. In Class: Nuclear Weapon Attack Exercise

### June 29: Consequences of Nuclear War

- A. Watch: *The Day After* (either the abbreviated, 54 min “class edit” or the entire 122 min film that President Reagan and other Americans watched)
- B. Read: Overpeck, “Remember! It’s Only a Movie!’ Expectations and Receptions of *The Day After* (1983)”
- C. DUE: Memo 4 (What Did *The Day After* Get Wrong?)

*The Day After* was a grim movie – but it could have been even grimmer. What physical and/or biological effects of nuclear weapons and fallout were ignored, underplayed, or simply misrepresented for the film’s broadcast television audience?

### July 4: No Class (Independence Day)

### July 6: Strategic Bombing and the Origins of American Nuclear Doctrine

- A. Read:
  1. Malloy, “‘The Rules of Civilized Warfare:’ Scientists, Soldiers, Civilians, and American Nuclear Targeting, 1940-1945”
  2. Freedman and Michaels, *The Evolution of Nuclear Strategy*, Chapters 1-10 (Textbook)
  3. Moltz, Chapters 2-3 ((in Wirtz and Larsen, Nuclear Command, Control, and Communications)
- B. Watch: *Strategic Bombing and the Origins of American Nuclear Doctrine* (142 min)
- C. DUE: Memo 5 (Whether McNamara, LeMay, and Truman committed any war crimes against Japanese civilians)

Taking into account customary international law (which prohibited deliberately targeting civilians, though not deliberately targeting military installations even if you knew that doing so was going to kill civilians) as well as the treaty law embodied in the Hague Conventions (discussed in the lecture), were President Truman, General Curtis LeMay, and/or Robert McNamara war criminals for their actions during World War II?

## July 11: Comparative Nuclear Doctrine

### A. Read:

1. Freedman and Michaels, *The Evolution of Nuclear Strategy*, Chapters 11-44
2. Larsen, Chapter 4 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
3. Arceneaux and Feaver, "The Fulcrum of Fragility: Command and Control in Regional Nuclear Powers" (Canvas)
4. Clary and Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities" (Canvas)
5. (Recommended) Lou, "Geopolitical "Entanglements" and the China-India-Pakistan Nuclear Trilemma" (Canvas)

### B. DUE: Memo 6 (Designing Indian Nuclear Doctrine)

What *should* India's declaratory and operational nuclear doctrines be? This assignment asks you to write an essay of 1200-2000 words (about four to six double-spaced pages) that:

- describes the *drivers* of change that have led to the evolution of India's nuclear doctrine over time
- demonstrates that one of our three major theories of comparative nuclear doctrine (realism, neoliberal institutionalism/organizational processes, or constructivism/strategic culture) better explains those changes than the others
- identify 2-4 *problems* with current Indian nuclear doctrine, and
- suggest *solutions* to those problems in the form of a revised Indian nuclear doctrine for the 2020s.

Every claim should be backed by theory and appropriate evidence (which may require a little research, although much can be found in the assigned readings). Be sure to properly cite all sources used, both in the text and in a Works Cited section at the end of the paper. Since this is a political science course, use APSA citations (see Writing Resources under the Canvas Files tab for a guide to them) for everything except any references to my lectures, which can simply be shortened to (*Lecture: Title of Lecture*) when cited in the text of the paper and which need not be included in the Works Cited section.

## Unit IV: Managing Escalation Risks

### July 13: Rational Deterrence Theory

#### A. Read:

1. Crook, Chapter 5 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
2. Pauly and McDermott, "The Psychology of Nuclear Brinkmanship" (Canvas)

#### B. DUE: India-Pakistan Stability Exercise (provided at end of syllabus)

This exercise asks you to plan a disarming first strike against Pakistan as India. If such a thing is possible at an acceptable cost to India, deterrence in South Asia is not stable. If it is impossible or too costly to contemplate, then deterrence is somewhat more stable (at least outside of crises that make each side fear preemption by the other). The exercise and its complete instructions are on Canvas, along with an Excel file you'll need to complete as part of the exercise.

#### C. In Class: Exercise on Indo-Pakistani Nuclear War Consequences

## July 18: Game Theory and Crisis Escalation

### A. Read:

1. Lindsay, Chapter 6 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
2. Huntley, Chapters 7-8 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
3. Kroenig, "Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes" (Canvas)
4. (Recommended) Logan, "The Nuclear Balance Is What States Make of It" (Canvas)

### B. Watch:

1. *Deterrence -- or Destruction? Part II* (155 min)
2. *1983: The Brink of Apocalypse* (75 min)

### B. DUE: Risk Evaluation Exercise (See Quizzes tab on Canvas)

### C. In Class: Crisis Simulation (simulate US, Russian, and Chinese behavior in hypothetical crises)

## July 20: Great Power Crises and the Idea of Limited Nuclear War

### A. Read:

1. Zala, "How the Next Nuclear Arms Race Will Be Different From the Last One" (Canvas)
2. Manzo and Warden, "After Nuclear First Use, What?" (Canvas)

### B. DUE: US-Soviet Crisis Exercise (Canvas: Quizzes tab)

This survey exercise involves a film about a hypothetical US-Soviet nuclear crisis (*By Dawn's Early Light*), set in the relatively friendly period of US-Soviet relations that existed just at the end of the Cold War in 1990 (before the Soviet Union began to disintegrate). To reduce the time needed for the exercise and to focus on the political choices in the film, I have carefully edited it down to 65 minutes for this class.\* I expect it will take you about **90 minutes** to complete the exercise.

Note that because this is implemented through the Canvas Quiz system, you can't stop in the middle and come back to it the next day or anything. There's plenty of time for bathroom breaks as needed, but the exercise needs to be completed in one sitting.

Essentially, the first set of questions has you watch part of the film and then decide what you would do if you had to make certain decisions in the crisis portrayed in the film. Once you see the end of the film, you'll be asked to answer a few more questions about it. Some questions are multiple-choice while others are free-form (Canvas calls these "Essay questions," but there's no essay-writing in this exercise -- I'm just looking for one sentence for most of them).

\* For the curious: I edited out a lot of scenes involving the aircrew of the B-52 bomber represented in the film. I deleted scenes about the pilot and copilot being involved in a romantic relationship, some "action" scenes in which the lumbering B-52 unrealistically downs a couple of Soviet fighters, the obligatory scene where some member of the crew goes crazy, etc. This cut of the film emphasizes the politics of the crisis, including the political actions of the B-52 aircrew -- not the interpersonal drama that originally padded the film's original running length to 100 minutes.

## July 25: Nuclear Proliferation

- A. Read: Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons" (Canvas)
- B. Watch: *Deterrence -- or Destruction? Part III* (185 min)
- C. DUE: Memo 7 on Nuclear Proliferation and Strategic Stability

Under what circumstances -- if any -- does *horizontal* nuclear proliferation enhance or detract from strategic stability, where "strategic stability" simply means the probability of large-scale war between the two states in a given dyad? Address the two situations of one rival going nuclear when both were previously limited to conventional weapons and both rivals going nuclear. By "going nuclear," I mean arming oneself with nuclear weapons -- proliferation -- not necessarily *using* such weapons.

## July 27: Are Nuclear Accidents Inevitable?

- A. Read:
  - 1. Malley, Chapter 9 (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
  - 2. Larsen, Conclusion (in Wirtz and Larsen, Nuclear Command, Control, and Communications)
- B. Watch:
  - 1. *Always/Never* (81 min)
  - 2. *Atomic Accidents* (about 100 min)
- C. Complete: Memo 8 on Atomic Accidents

The world has seen a number of serious nuclear power plant accidents. However, there has yet to be an accidental or unauthorized detonation of a nuclear weapon. How likely is the accidental or unauthorized detonation of a nuclear weapon?

## Integration of Knowledge (Online Final Exam)

Complete the Final Exam on Canvas (see the Quizzes tab) by 11:59 PM on **Friday, July 28**. **Begin the exam at least three hours earlier** to allow time to complete and submit your answers by the deadline.

## India-Pakistan Stability Exercise

### Overview

Your job in this assignment is to evaluate the stability of India-Pakistan nuclear deterrence. Nuclear deterrence is generally thought to require a secure second-strike capability by each side. That is, even after absorbing a surprise attack by the other side, each country must be able to inflict unacceptable damage to its opponent. India has always enjoyed second-strike capability because most of Pakistan's weapons cannot reach far parts of India. This means that simply by storing its weapons some distance from the border, India can protect itself for the next ten years or more. Pakistan, on the other hand, is entirely within range of most Indian air forces. This vulnerability has led it to rush forward with the production and testing of ballistic missiles capable of reaching distant targets in India, even if the Pakistani air force is destroyed on the ground. But has it really succeeded in building a viable second-strike force? Given these facts, the primary threat to strategic stability (from the perspective of rational deterrence theory) is the danger that India could destroy Pakistan's ability to retaliate (second-strike capability) in a nuclear first strike. We will use this exercise as the basis for one or more in-class exercises.

### Instructions

- I. Simulate an Indian first strike on Pakistan, given both strategic and tactical surprise. This is the best-case scenario for a nuclear war from India's standpoint, and a worst-case scenario for Pakistan's military planners.
  - A. Strategic Objectives: Assume that Pakistan has at least a few road-mobile nuclear-tipped missiles. However, unless a crisis occurs, these are probably kept in hardened storage facilities to prevent theft or destruction of the weapons by domestic insurgents. Accordingly, to eliminate the Pakistani nuclear threat, India will have to
    1. Destroy the two known locations of road-mobile missiles: Sargodha (a hardened facility on the map linked on Canvas – see Pages → View All Pages → India-Pakistan Assignment Resources) and Fatehjang (a “soft” facility 25 miles southwest of Rawalpindi, also shown on the map on Canvas). See C below for a description of what makes a target “hard” or “soft” with respect to nuclear weapons.
    2. Destroy Pakistan's nuclear-capable aircraft before they can be armed with nuclear weapons and depart their airfields. Assume that all of the aircraft listed as nuclear-capable are potential Pakistani nuclear weapon delivery systems. Go to <http://www.fas.org/nuke/guide/pakistan/facility/airbase/index.html> (link on Canvas) for the locations of most of Pakistan's airfields. You need to destroy those that may accommodate Pakistan's nuclear-capable aircraft. Your goal is destruction of all MOBs and FOBs (labeled as such in the Excel file); additional security is provided by destroying all satellite airfields.
    3. Destroy Pakistan's ability to retaliate over the long term by targeting its nuclear weapons and other nuclear facilities. You need not hit its research reactors and test sites, but you should destroy the rest of the nuclear weapon and missile facilities listed at <https://nuke.fas.org/guide/pakistan/facility/index.html> (link on Canvas)
  - B. Tactical Overview: In order to understand how nuclear attacks are planned – a key aspect of whether deterrence can be stable – you must understand how nuclear weapons destroy targets. “Soft” targets are unreinforced and unarmored, like people and their houses. They are easy to kill. “Hard” targets, on the other hand, are heavily reinforced. In order to determine the number and strength of Indian nuclear weapons required to destroy a given Pakistani target, you should

understand how defense planners calculate a “kill probability” for a given combination of weapon, delivery system, and target. Most of the following information is taken from David W. Hafemeister, Physics of Societal Issues: Calculations on National Security, Environment, and Energy, 2007:

The general formula for a single-shot kill using a nuclear blast incorporates four central variables:

- A constant term derived from tests of nuclear weapons’ destructive power. This describes how much nuclear explosive power is required to generate a shock wave of a given strength. For our purposes, it is about .22, and already incorporated in the equation below. This assumes a surface or near-surface burst, because these produce the strongest shock waves near the point of detonation.
- The overpressure (strength of shock wave) required to destroy the target – in other words – its “hardness.” This is usually measured in pounds per square inch (psi). It only takes about 0.25 psi to shatter glass – this is roughly the equivalent of hurricane-force winds. Trailers are destroyed at 1 psi. Unreinforced masonry and brick walls crumble at 1.5 psi (tornado-strength winds); if reinforced with steel, they last until 2.5 psi, when all but the steel frame is destroyed. Some of today’s hardened missile and aircraft shelters are built from extremely strong reinforced concrete and partially buried underground. These can require up to 150 psi to destroy.
- Yield of the nuclear weapon, in megatons.
- The accuracy of the nuclear weapon (how far it lands from its target), in nautical miles (one nautical mile = 6076 feet). This is given as CEP, or circular-error-probable. A weapon is equally likely to land anywhere within the CEP. In World War II, most high-altitude bombers had a CEP of about one mile, while low-level bombing managed to improve this to about 1600 feet (0.26 nautical miles). By Vietnam, the US was able to achieve a CEP of 750 feet (0.12 nautical miles) using fighter-bomber aircraft. By the end of the war, unguided bombs were being delivered with a precision of about 365 feet (.06 nautical miles), although this required dangerous, low-level attacks.

Using these factors, we can calculate the single-shot kill probability (SSKP) for an attack on a target using a single nuclear weapon (copied from Hafemeister, p.38):

$$SSKP = 1 - \exp(-Y^{2/3} / 0.22H^{2/3}CEP^2),$$

where  $Y$  is in megaton,  $H$  is in psi, and  $CEP$  is in nautical miles (1860 m).’

Of course, all of this assumes that the nuclear weapon actually reaches the target area and functions as intended. There is always some probability that a bomb fails to detonate, or that the bomber or missile carrying it fails to make it to the target area. Missiles can misfire or even be shot down. Of course, bombers are extremely vulnerable to defending fighters and surface-to-air missiles (SAMs). In order to be more realistic, one more variable is needed to represent the reliability of the weapon/delivery system combination. The kill probability of a single attack is therefore:

$$PK = R (SSKP)$$

where  $R$  is the reliability of the attack system (between 0 and 1). If there are multiple attacks, one simply uses the laws of probability to determine the chance that at least one of them destroys the target. So the joint probability of destroying a target with  $N$  attacks is

$$PK_{joint} = 1 - \prod_{i=1}^N [1 - PK_N]$$

**Fortunately, I have an Excel file that does all this math for you.** You only need to enter the reliability (between 0 and 1), yield of the weapon (in kilotons – Excel will convert it to megatons in the equation), its accuracy (in nautical miles), and the hardness of the target (in psi). If you would like to use two attacks instead of one, simply enter this information for the second strike as well, and the Excel file will tell you the probability that attack 1 destroys the target, the probability that attack 2 destroys the target, and the joint probability that the target is destroyed by the two attacks. You shouldn't need more than two attacks to destroy a target, but if you want to calculate the joint probability that three attacks destroy a target, Excel will do that as well. *PK (1)* is the probability the first weapon destroyed the target. *PK (2)* is the probability the second weapon (if there was a second weapon) destroyed the target. *PK (3)* is the probability the third weapon (if there was a third weapon) destroyed the target. *PK (joint)* is the probability that at least one weapon used destroyed the target.

- C. Download the Excel file from Canvas (under the Files tab, in the Assignment Resources folder), which contains a list of targets. Indicate how you intend to destroy each. For most targets, success requires a 95% chance of destruction. For Sargodha and the MOBs, higher certainty is required – **these must be destroyed with 98% probability**. For each target, list the aircraft used and the number and size of warheads needed to gain 95% (or 98%) confidence that the target is destroyed – **this refers to PK (joint)**.
1. Yield: Assume that India's nuclear arsenal contains the following weapons for the operation, given the need to reserve some to deter the PRC:
    - a. 6 boosted-fission devices (50 kilotons each) – deliverable by aircraft only
    - b. 40 large fission devices (35 kilotons each) – deliverable by ballistic missile or aircraft
    - c. 20 moderate fission devices (20 kilotons each) – deliverable by ballistic missile or aircraft
    - d. 36 small fission devices (12 kilotons each) – deliverable by ballistic missile or aircraft
    - e. 10 tactical fission weapons (1 kiloton each) – deliverable by ballistic missile or aircraft
  2. Delivery Systems: Assume the following are available for the strike, given the need to reserve some missiles and aircraft to deter the PRC:
    - a. Mirage 2000H aircraft that can carry devices of any yield to anywhere in Pakistan (26)
    - b. Jaguar IS aircraft that can carry devices of any yield to anywhere in Pakistan (12)
    - c. Privthi-II short-range missiles that can carry a 12 kt or "smaller" weapon 300 km (24)
    - d. Agni-I medium-range missiles that can carry a 40 kt or "smaller" weapon 700 km (16)
    - e. Agni-II intermediate-range missiles that can carry a 40 kt or "smaller" weapon to anywhere in Pakistan (16)
  3. CEP:
    - a. A circular-error-probable (CEP, or accuracy) of about 500 feet (.08 nm) is well within the capability of both of India's delivery aircraft. However, for weapons larger than 20 kilotons, the pilot will have to release at a higher altitude in order to escape the blast, reducing accuracy:
      - i. 1-20 kilotons: CEP = 500 feet (.08 nautical miles)
      - ii. > 20 kilotons: CEP = 650 feet (.11 nautical miles)
    - b. Estimated CEP values for the available Indian ballistic missiles are:
      - i. Privthi-II: CEP = 50 feet (.008 nautical miles)
      - ii. Agni-I: CEP = 25 feet (.004 nautical miles)
      - iii. Agni-II: CEP = 40 feet (.0065 nautical miles)
  4. Reliability: Essentially, reliability measures whether the aircraft makes it to the target and releases a bomb. So any aircraft or missiles shot down are considered "unreliable." The

data here are largely speculative, since it has been 30 years since Indian aircraft engaged targets in Pakistan in large numbers. In previous conflicts, the Indians lost about one aircraft for every hundred sorties. This suggests .99 reliability. However, an Indian study in the early 1980s concluded that about half the attacking bombers would be shot down if India bombed the Kahuta reactor using conventional weapons (a reliability of .5). During a string of tit-for-tat air strikes in 2019, one Indian fighter (of 12 deployed) was shot down (a reliability of .92). Given a surprise attack across the whole of Pakistan, however, an optimistic assumption would be that **aircraft reliability = .96** and **ballistic missile reliability = .98**.

5. The hardness of the target varies, and is already entered into the Excel file. Exposed aircraft, even small fighters, are destroyed at overpressures of 3 psi, so we estimate a hardness of 3 for FOB and satellite airfields. However, the MOB airfields probably have hardened shelters for at least some nuclear-capable aircraft, as does the missile facility at Sargodha. In these cases, a hardness of 150 psi should be used. Finally, nuclear facilities are likely to be effectively destroyed by overpressures of only 5 psi (some structures will remain, but most will be too heavily damaged to be usable).

II. Evaluate the results of the first strike.

- A. Using a red pen or pencil, mark each strike on the attached map of Pakistan (you must use this map, since it needs to fit an overlay we'll be using in class). Note: The web site listing Pakistan's air bases also has a map showing their locations. Deadly Arsenals has a map showing locations of nuclear facilities. Use the following symbols, which will make our in-class exercise easier. For strikes using multiple weapons, add the kt together and use the symbol for the nearest yield.

1. Strikes on "hard targets" (MOBs and missile shelters) – these weapons will be ground-bursts, creating copious quantities of fallout:

150 kt or greater = ☀, 50 kt-149 kt = ○, 35 kt or lower = ☆

2. Strikes on "soft targets" (all others) – these weapons will be airbursts, killing more people but creating little fallout: ● (for all)

- B. Type up your answers to the following questions:

1. Does India have the capability for attaining a 95%/98% chance of destroying each target? Anything less than a nuclear weapon is unlikely to offer anything close to that assurance of destruction. So you were limited to the number of deliverable nuclear weapons in India's possession. Were you able to destroy all threats? If not, which threats would require follow-up strikes with conventional or reserved nuclear weapons?
2. How many nuclear weapons does India have left after conducting its first strike? We reserved 40 to deter the PRC, so you can add those to any left over from the arsenal listed above.
3. Take a look at your map. Which cities, if any, are so close to your targets that you would have destroyed them as well?
4. How much warning would Pakistan have of the attack? Find the farthest target from the Indian border that you hit with an aircraft and compute the time needed for an aircraft moving at about 1200 mph to reach the target (hint: multiply distance in miles by .05 to get the number of minutes to reach the target). As for ballistic missiles, even if Pakistan instantly detected launches, the flight times of Indian missiles attacking Pakistan are likely to be no longer than five or six minutes. Given this warning, would Pakistan have time to mount/load its nuclear weapons on its aircraft, get the aircraft off the runway, and get

away from the blast zone? Would it have time to drive its mobile missiles out of their shelters and fire them?

- III. Finally, evaluate the stability of India-Pakistan deterrence by typing up answers to the following questions:
- A. If you were Pakistan, would you feel secure from nuclear attack under the current conditions?
  - B. List at least three steps that Pakistan could take to increase its odds of maintaining a second-strike retaliatory capability. Hint: Your suggested measures should have one or more of the following consequences: decrease reliability of Indian aircraft/missiles, increase hardness of Pakistani targets, increase the number of Pakistani targets, decrease the reliance of Pakistan on aircraft to deliver bombs, and/or increase the odds that Pakistani aircraft could escape destruction in the minutes between the detection of an Indian attack and the Indian nuclear strikes.
  - C. To what extent would implementing the measures you just suggested convince India that Pakistan was actually preparing a first strike against India? That is, are your defensive measures likely to be viewed as offensive?
  - D. Would your changes increase the probability of crisis escalation, unauthorized use, or accidental launch?
- IV. Turn in:
- A. Your completed Excel spreadsheet, printed in **landscape orientation** so the cells fit on one page width.
  - B. Your map with targets marked. Again, use the attached one. We'll be using overlays in class that match this map.



