POSC 248 – Studies in Weapons of Mass Destruction

This course, taught using a robust multi-disciplinary approach, will introduce students to the background, use, control, and long-term implications of Weapons of Mass Destruction (WMD).

We will integrate a historical study of the use of WMD between warring factions in conflict with a thorough review of the policies used to justify their development, maintenance, and the planned use of such devices in support of national and international security objectives in the modern era. We’ll continue with an in-depth review of the post-World War II establishment of international political mechanisms designed to control or eliminate WMD from the arsenals of nations around the world. To enrich student understanding of WMD, we’ll delve deeply into the mechanics of nuclear and radiological weapons, chemical weapons, and biological weapons, bringing the expertise of professors from across the Carleton College faculty to discuss these subjects. As we move further into the course, we’ll contemplate the digital revolution and the implications these changes could bring to the world should nation states, or even individuals, gain access to key infrastructure, thus using cyber tools as a new form of WMD.

We will augment lectures, classroom discussions, reading assignments, and research papers with guest lecturers who have direct and daily involvement with such issues as counter-proliferation, arms reductions, incident response, national security, and scientific research.

Course Lecturers’ Contact Information and Office Hours

Jon Olson – Political Science (Lead Instructor)
Office:  Willis Hall, Room 416
Email:  jolson@carleton.edu or jonolson1967@gmail.com
Phone:  (612) 834-8113
Skype:  MPLS.Jon.Olson
Office Hours:  Tuesday and Thursday, from 9AM to 11:30AM, by Appointment

Joe Chihade – Chemistry/Biochemistry
Office:  Old Music, Room 102
Email:  jchihade@carleton.edu
Phone:  (507) 222-7446
Office Hours:  Make Appointment through Website

Eric Hazlett – Physics and Astronomy
Office:  Olin Hall, Room 335
Email:  ehazlett@carleton.edu
Phone:  (507) 222-7167
Office Hours:  Tuesday, Wednesday, and Thursday from 11AM to 12PM, by Appointment
Course Learning Objectives

By the conclusion of this course, the successful student will be able to:

- Cite specific examples of the use of WMD in world history
- Explain the development of WMD during the Cold War, to include national security doctrine for building, maintaining, and potentially using these weapons in war or crisis
- Outline the events and/or movements that led to the international community choosing to ban chemical and biological weapons
- Explain the mechanisms on the international treaty regime to control BW and CW
- Explain the transition from Cold War nuclear doctrine to modern nation-state nuclear weapons theory, programs, and use strategies
- Identify the myriad nuclear weapons control and reduction efforts between nation states over the last 50 years
- Explain the biochemical mechanisms that cause CW to kill or maim populations
- Explain the differences between different types of CW weapons, to include persistence and many other factors
- Explain the bacteriology, virology, and fungal mechanisms that cause BW to kill or maim populations, to include understanding how spores operate
- Explain the differences between various weaponized disease organisms and what the ramifications are for the treatment or cure of large populations affected by disease
- Explain the fundamental concepts regarding the building, maintenance, delivery, and explosive mechanism of nuclear and radiological weapons
- Define and discuss core issues related to nuclear weapons, to include delivery options, “throw weight,” and other nuclear warfare terminologies
- Articulate the threats in the digital age regarding the “weaponization” of cyber tools and capabilities
• Explain the concept of SCADA and how access to systems could result in catastrophic failure of “systems of systems”
• Demonstrate an integrative understanding of the philosophical implications of WMD

**Required Texts**


There may be additional hand-outs for each session, or assigned research before specific classes. Students will be expected to complete all assigned reading prior to each class.

**Graded Assignments**

**Individual Research Paper** (35 Points). Students will write an individual research paper on some aspect of weapons of mass destruction. Topics might include the weapons themselves, delivery systems, international control regimes, or international/national security challenges in dealing with these weapons systems, among many other options. The paper will be between 12-15 pages in length. Clear your topic with the Lead Instructor before you embark on your research and writing effort.

**Group Project** (12 Points Group Grade / 8 Points Individual Grade / 20 Points Total): Students will be randomly assigned a group on the first day of the course. Groups will be randomly assigned a topic relating to nuclear, chemical, biological, or cyber, and will be required to craft a short paper and presentation on a specific topic of WMD as defined by the group, the Lead Instructor, and one of the other professors teaching the course. Group presentations will be part of an evening meeting between the group and the instructors and will entail an in-depth discussion on the group’s topic. The evening meetings will take place in the first week after the
group’s respective module concludes and will last roughly two hours. Students will receive both a group grade and an individual participation grade. See the class schedule for details.

**Module Summaries** (5 Points Each/25 Points Total): At the conclusion of each module, students will be given a number of questions. Students will select ONE question and provide a short paper, no more than three pages in length, that fully addresses the question.

**Final Exam** (20 Points): Students will be provided a list of questions. Students will select ONE question to answer in the form of a final paper. Final exams will be between 8-12 pages in length and will fully address the selected question.

**Graded Work**

*Individual Research Paper:* 35 Points

*Group Project* (12 Points for Group Grade / 8 Points for Individual Participation): 20 Points

*Module Papers* (5 Short Papers worth 5 Points Each): 25 Points

*Final Exam:* 20 Points

A total of 100 Points available in the course.

*All written assignments must be completed in Times New Roman, 12-font, and double-spaced, in hard copy. No exceptions.*

**Final Grades**

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<td>97% and Above</td>
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<td>92-96%</td>
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<td>90-91%</td>
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<td>87-89%</td>
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<td>59% and Below</td>
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Course Schedule

Tuesday, September 12th  Session One – Course Introduction

All Instructors

- Instructor Introductions
- Student Introductions
- Syllabus Review
- Group Assignments
- Initial Discussions on WMD

Module One – Weapons of Mass Destruction / Policy and Strategy Foundations

Thursday, September 14th  Session Two – Background on WMD

Clara Hardy

- Discussion - Definition of “Weapons of Mass Destruction”
- Historical Study of the Use of WMD in Conflict
  - Antiquity Through the Byzantine Period
- Reading Assignments:
  - Handouts

Tuesday, September 19th  Session Three – WMD and National/International Security

Jon Olson

- Creation of WMD Arsenals
  - World War I
  - World War II
  - Post-World War II Strategic Calculations
  - Cold War Incentives for Expanding WMD Capabilities
- Reading Assignments:
  - Cimbala, Chapters 1 through 3
  - Handouts
Module Two - Nuclear and Radiological Weapons

Thursday, September 21st  Session Four – The Mechanics of Nuclear Weapons

Eric Hazlett

• How to Build a Nuclear Weapon
• Reading Assignments:
  o Cimbala, Chapters 3 and 4
  o Lewis, Chapters 1 and 2
• Due: Module One Paper (WMD Foundations)

Tuesday, September 26th  Session Five – The Consequences of Nuclear Weapons

Eric Hazlett

• “There is a bomb. Now, what are you going to do with it?”
• Reading Assignments:
  o Cimbala, Chapters 5 and 6
  o Lewis, Chapters 3 and 4

Thursday, September 28th  Session Six – Guest Speaker (Via Skype)

Stephen Young - Senior Analyst and Washington Representative from The Union of Concerned Scientists / Carleton - Class of ’85

• Reading Assignments:
  o Cimbala, Chapters 7 and 8
  o Lewis, Chapter 5
  o Research the Union of Concerned Scientists Website

Tuesday, October 3rd  Session Seven – International Controls on Nuclear Weapons

Jon Olson

• The International Control Regimes on Nuclear Weapons
  o Cold War Treaties
  o Non-Proliferation Efforts / Counter-Proliferation Efforts
  o Post-Cold War Alterations to Control Regimes
  o Future Uncertainty
• Reading Assignments:
  o Potter, Chapters 1, 2, and 4
  o Handouts
Module Three – Chemical Weapons

Thursday, October 5th  Session Eight – Guest Speaker on Chemical Weapons

Special Agent F. M. Stephens
Weapons of Mass Destruction Coordinator
Federal Bureau of Investigation

- Reading Assignments:
  - Croddy, Chapters 1 through 3
- Due: Module Two Paper (Nuclear Weapons)
- Group “A” Dinner Discussion – Nuclear Weapons

Tuesday, October 10th  Session Nine – The Mechanics of Chemical Weapons

Joe Chihade

- How to Create Chemical Weapons
- Reading Assignments:
  - Croddy, Chapter 4
  - Handouts
- Group “B” Dinner Discussion – Nuclear Weapons

Thursday, October 12th  Session Ten – The Consequences of Chemical Weapons

Joe Chihade

- What Happens When Chemical Weapons Are Released?
- Reading Assignments:
  - Croddy, Chapter 5
  - Handouts

Tuesday, October 17th  Session Eleven – International Controls on Chemical Weapons

Jon Olson

- International Control Regimes on Chemical Weapons
  - Cold War Treaties
  - Post-Cold War Challenges
  - Counter-proliferation of Chemical Weapons
- Reading Assignments:
  - Croddy, Chapter 6
  - Handouts
Module Four – Biological Weapons

Thursday, October 19th  Session Twelve – Guest Speaker on Biological Weapons

Michael Osterholm, PhD, MPH, University of Minnesota

- Reading Assignments:
  - Osterholm – Chapters 1 through 4, 16, 17, and 21
- Due: Module Three Paper (Chemical Weapons)
- Group “C” Dinner Discussion – Chemical Weapons

Tuesday, October 24th  Session Thirteen – The Mechanics of Biological Weapons

Joe Chihade

- How to Create Biological Weapons
- Reading Assignments:
  - Croddy, Chapters 7 and 8
  - Handout – Alibek, “Biohazard”
  - Handout – Barenblatt, “A Plague Upon Humanity”
- Group “D” Dinner Discussion – Chemical Weapons

Thursday, October 26th  Session Fourteen – The Consequences of Biological Weapons

Joe Chihade

- Infection
- Reading Assignments:
  - Croddy, Chapter 10
  - Handout – Alibek, “Biohazard”
  - Handout – Barenblatt, “A Plague Upon Humanity”

Tuesday, October 31st  Session Fifteen – International Controls on Biological Weapons

Jon Olson

- International Control Regimes on Biological Weapons
  - Cold War Treaties
  - Post-Cold War Challenges
  - Counter-proliferation of Biological Weapons
- Reading Assignments:
  - Croddy, Chapter 9
  - Handouts
• Due: **Individual Research Paper**

*Module Five – Cyber Weapons*

**Thursday, November 2nd**  
**Session Sixteen – Understanding the Cyber World**

**Jeff Ondich**

- **Reading Assignments:**
  - Handouts
- Due: **Module Four Paper (Biological Weapons)**

**Tuesday, November 7th**  
**Session Seventeen – Guest Speaker on Military Cyber Defense**  
*(Via Skype)*

**Rear Admiral Michael Studeman, U.S. Navy**  
Director of Intelligence (J2), U.S. Southern Command

- **Reading Assignments:**
  - Handouts
  - Watch the film “Zero Days”
  - Research the National Security Agency (NSA)
  - **Group “E” Dinner Discussion – Biological Weapons**

**Thursday, November 9th**  
**Session Eighteen – The Future of Cyber**

**Jeff Ondich**

- The Internet of Everything
- Implications for the Future

- **Reading Assignments:**
  - Handouts
- **Group “F” Dinner Discussion – Biological Weapons**
Course Summary and Review

Tuesday, November 14th  Session Nineteen – Course Review

All Instructors

• Assign Final Exam (Take Home)
• Due: Module Five Paper (Cyber)
• Group “G: Dinner Discussion – Cyber Conflict

Tuesday, November 21st  Final Exam Due at 12:00PM (Hard Copy Only)
Paper Grading Criteria

Focus:

Did the author craft a paper or essay commensurate with the question and thesis?
Has the author clearly identified the thesis early in the paper?
Does the author fully develop the thesis?
Has the author avoided pointless or distracting departures from the thesis?

Critical Analysis:

Does the paper offer adequate analysis?
Does the author marshal convincing evidence to support the thesis?
Does the author consider, explicitly or implicitly, counter-arguments to or weaknesses in the thesis and supporting evidence?
Are judgments and conclusions logically supported?
Does the conclusion adequately address, resolve, or support the thesis?
Has the author avoided personal slants in the paper, using facts and data to support conclusions?

Organization:

Are the organization and flow of the paper logical?
Is the paper balanced, quantitatively and qualitatively?

Readability and Style:

Has the author used effective transitions from one argument to the next?
Has the author avoided long, cumbersome sentences and paragraphs?

Professionalism:

Has the author carefully proofread the text of the paper?
Did the author ensure the essay was free of spelling and punctuation errors?

Concluding Arguments:

Has the author professionally completed the assignment by drawing final conclusions?

*I will assess these factors and reach your final grade for the assignment based on how well you address the above criteria.*