This course focuses on how history, philosophy and social studies of science investigates the relationship between science, technology and security issues. Our focus will be on security in relation to war and violence, particularly the control of biological, chemical and nuclear weapons; automation and simulation in war; the use of non-lethal weapons; and the role of secrecy, absence and ignorance in security and war. To address this issue, the course will explore concepts and ideas derived from science and technology studies such as tacit knowledge; social shaping of technology; actor-network theory; risk; secrecy, uncertainty, ignorance and science; and bio-politics.

Course Information

<table>
<thead>
<tr>
<th>Basic course information</th>
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<tbody>
<tr>
<td>Course website:</td>
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<td>Required texts:</td>
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</tr>
<tr>
<td>Course tutor:</td>
<td>Prof. Brian Balmer</td>
</tr>
<tr>
<td>Contact:</td>
<td><a href="mailto:b.balmer@ucl.ac.uk">b.balmer@ucl.ac.uk</a></td>
</tr>
<tr>
<td></td>
<td>020 7679 3924</td>
</tr>
<tr>
<td>Web:</td>
<td><a href="http://www.ucl.ac.uk/silva/sts/staff/balmer">www.ucl.ac.uk/silva/sts/staff/balmer</a></td>
</tr>
<tr>
<td>Office location:</td>
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<td>Office hours:</td>
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## Schedule

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<tr>
<td>20</td>
<td>Introduction to the Course: STS, Security and War</td>
<td>Overview</td>
<td>15/1</td>
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<tr>
<td>21</td>
<td>How does STS study military technology?</td>
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<td>22</td>
<td>Are scientists responsible for the weapons they create?</td>
<td>Ethics and STS</td>
<td>29/1</td>
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<td>23</td>
<td>Disarmament and Arms Control</td>
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<td>5/2</td>
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<tr>
<td>24</td>
<td>Tacit Knowledge and Security</td>
<td>Epistemology and STS</td>
<td>12/2</td>
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<td>24</td>
<td><strong>Short Review Due</strong></td>
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<td>25</td>
<td><strong>Reading Week</strong></td>
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<td>19/2</td>
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<td>26</td>
<td>Non-Knowledge and Security: Secrecy, Ignorance and Absence</td>
<td>Epistemology and STS</td>
<td>26/2</td>
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<td>27</td>
<td>War Every Day? The securitization and militarization of the mundane</td>
<td>Domestic Security</td>
<td>4/3</td>
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<tr>
<td>28</td>
<td>Security and Law: Forensic Science and Lie Detectors</td>
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<td>11/3</td>
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<tr>
<td>29</td>
<td>Automatic War</td>
<td>The Battlefield</td>
<td>18/3</td>
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<td>30</td>
<td>After War: Who Counts the Dead</td>
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<td>Peace !!</td>
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## Assessments

### Summary

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<tr>
<td>2</td>
<td>Essay (4000 words) (80%)</td>
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<td>4000</td>
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Assignments

Instructions for the two written assignments are at the end of this course syllabus.

Criteria for assessment
The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Aims & objectives

This course investigates the relationship between science, technology and war, primarily using intellectual tools from history, philosophy and sociology of science. The course explores military science and technologies in their social, political and historical context, and focuses mainly on the twentieth and twenty-first centuries.

By the end of this course you should:

- Be able to apply critical STS thinking to understanding issues around science, technology, war and security.
- Have developed knowledge of the history and governance of modern military technologies.
- Have been able to write both (a) concise review and (b) an extended essay on topics relevant to the course
- Be able to make links between broader concepts in STS and how they apply to the specific domain of war and security.

Course expectations

Lectures and seminars
Each week there will be a one hour lecture followed by a seminar discussion. You should complete the “seminar reading(s)” for each topic.

Reading:

The notes that you take in lectures will not be detailed enough to understand a topic or to write an essay on that topic. It is therefore essential that you make use of the reading lists. In essays you are expected read widely and to use (and make reference to) material in addition to that labelled essential reading. You may use material that is not on the reading list but use all readings critically - you don't necessarily have to agree with everything you read.

Where to find the reading material

No one text covers this course. Most of the required and optional reading material is kept in the DMS Watson science library. Where possible we will make seminar readings available on Moodle. Unless otherwise marked, assume journal articles are available online through the library Electronic Journals link. All of the seminar readings, unless otherwise noted, can be accessed electronically through the library or Moodle page. There is a reading list on Moodle (right hand column) of digitized readings which would otherwise be more difficult to access.

There is also useful material kept in Senate House Library which you can obtain a library card with your
UCL Identity Card. You are also encouraged to use the **Wellcome Library.** The Service is a reference library with a large collection of science policy material - including some material on chemical and biological warfare.

You are also encouraged to use the internet for research. However make sure you reference the full web address, the site title and date visited. Be critical of what you read. Be very careful of purely descriptive sites, such as Wikipedia – we are looking for *analysis* and *argument* in your essays not just re-hashing basic information.

**Also note that plagiarism, particularly involving internet sources, will be treated as a severe exam irregularity.**

**Attendance**
Anyone who misses more than 70% lectures or seminars will be asked to provide an explanation. Anyone who fails to provide an adequate documented explanation may be declared INCOMPLETE for the course.
Week 1
Introduction to the Course: Science, Security and War

Essential Reading:


Recommended Reading:


These are readings that set the broad context for the course and contain useful background material - particularly if you feel there is a gap in your knowledge.


Wolfe, A. (2012). Competing with the Soviets: Science, Technology, and the State in Cold War America (Johns Hopkins Introductory Studies in the History of Science) (Short, extremely readable overview of science in Cold War USA)

Week 2
How Does STS Study Military Technology?

Lecture: Where does new military technology come from? What role does science play in the invention of new military technologies? What does it mean to claim that a technology is ‘socially shaped’?

Seminar Reading:

Background:
If you have not studied any sociology of technology before then:

Seminar Focus:

Additional Reading


*Specific Case Studies Discussed in the Lecture:*


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**Week 2**

**Are Scientists Responsible for the Weapons they Create?**

This lecture will explore two senses of this moral question. What are the responsibilities of scientists doing research on weapons? Secondly, are scientists responsible for how those weapons are used? The lecture will explore how scientists have dealt with these issues during the 20th Century.

**Seminar Reading:**


**Additional Reading**


University Press) (Chapters 3-4) (E-book).


**EITHER**
(Haber stands in contrast to Oppenheimer in the ways they handled their vocation and violence)

**OR**


**Human Experiments and the Military**

(Argues that the material body parts from bomb victims, and the way they are (mis)treated, are a way of ‘instantiating’ (i.e. making concrete) abstract ideas such as victory in war).


**Week 3**

**Disarmament and Arms Control:**

**Can Chemical and Biological Weapons Be Controlled?**

What factors guide the proliferation of weapons of mass destruction (atomic, biological and chemical weapons)? How can we prevent the spread and use of weapons of mass destruction? What role do international treaties play? The lecture will focus on chemical and biological weapons control.

**Seminar Readings:**
The readings have been chosen to address three possible sources of biological weapons threat: nation states; so-called ‘dual use research of concern’, and bioterrorism.

Lentzos, F. (2013). *Hard to Prove: Compliance with the Biological Weapons Convention*. King's


### Additional Reading

**Arms Control Treaties:**


**Chemical Weapons**


**Biological Weapons:**


Guillemin, J (2005), *Biological Weapons: From State-Sponsored Programs to Contemporary Bioterrorism*, New York ; Chichester: Columbia University Press (Chapters 1, 8 and 9)


Dual-Use


Four STS articles all on pandemic flu and dual use:


Week 4
Tacit Knowledge and Security

The concept of ‘tacit knowledge’ has a long history within STS and has more recently been adopted by various scholars within and beyond STS in relation to security and arms control. The concept is now starting to be used in arms control discussions beyond academia. Yet, while undoubtedly a useful concept, there is surprisingly little literature that is critical or challenges ‘tacit knowledge’.

Seminar Reading


Additional Reading


Schmidt, K (2012), ‘The trouble with ‘tacit knowledge’’, *Computer Supported Cooperative Work* 21:163-225 [Not about security but one of the few critiques of ‘tacit knowledge’]


*Not about security but useful for digging into ‘tacit knowledge’:


(Chapter 3 on replicating the TEA laser)


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**Week 5**

**Non-Knowledge and Security: Secrecy, Ignorance, Absence**

Security is a field where uncertainty, secrecy and other forms of non-knowledge are ubiquitous. STS has recently turned from looking at the construction on knowledge to also look at these various forms of non-knowledge. If there can be a sociology of scientific knowledge, can there equally be a sociology of ignorance? With respect to secrecy, a combination of STS with the geography of knowledge has promised to re-think the dynamics of secrecy.

**Seminar Reading**

Additional Reading


Balmer, B (2012), *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare* (Farnham: Ashgate) (Chapter 1 for a review of literature on science and secrecy; Chapter 7 for the VX nerve gas case study) [E-book].


Not about security but relevant:


**Week 6**

**War Every Day?**

The securitzation and militarization of the mundane and everyday life

How does military science and technology creep into civilian life? Are uses of non-lethal weapons, or the merging of public health and biosecurity issues, for instance, to be welcomed or challenged?

**Seminar Reading:**


**Additional Reading**

*Preparedness and Emergencies*


*CCTV*


*Borders*


*Non-lethal weapons*


Davison, N (2009), *NonLethal Weapons* (Basingstoke: Palgrave)

*Securitization and Militarization*


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**Week 7**

**Security and Law: Forensic Science and Lie Detectors**

STS has built up a rich body of literature looking at science and the law. Although much of this work touches on broader criminological themes than security, much of it is relevant to thinking about how technology, crime and security inter-relate.

**Seminar Readings**


**Additional Reading**

Maschke, K (2008) ‘DNA and Law Enforcement’ in From Birth to Death and Bench to Clinic: The Hastings Center Bioethics Briefing Book


Skinner, D and Wienroth, M (2019), ‘Was this an ending? The destruction of samples and deletion of records from the UK Police National DNA Database’, *BJHS Themes* Vol. 4 pp. 99-121

https://www.cambridge.org/core/journals/bjhs-themes/article/was-this-an-ending-the-destruction-of-samples-and-deletion-of-records-from-the-uk-police-national-dna-database/B9454A08928AAE907FB0C8FF7103CFA3


(This is an introduction to a special edition of this journal, with all the articles dealing with DNA profiling – read this intro to see whether the other articles are going to be helpful)


Other crime technologies:


Facial recognition. There are plenty of journalistic articles on this topic, rather less STS analysis. This newspaper article digs below the surface and asks about the decisions and theories underpinning the algorithms:


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**Week 8**

**Automatic War**
The application of information technologies to warfare is not new. However, since the Vietnam War there has been an intensification of the trend, with talk of an ‘automated battlefield’, a ‘revolution in military affairs’ and the widespread deployment of apparently autonomous weapons – self-guiding missiles, drones and so on.

Seminar Reading

Sullins, P (2013), An Ethical Analysis of the Case for Robotic Weapons Arms Control, in 5th International Conference on Cyber Conflict K. Podins, J. Stinissen, M. Maybaum (Eds.)
https://ccdcoe.org/cycon/2013/proceedings/d2r1s9_sullins.pdf

Sharkey, N., Suchman, L (2013), Wishful mnemonics and autonomous killing machines
https://eprints.lancs.ac.uk/id/eprint/65657/1/Sharkey_Suchman_AISBQ_136.pdf

Additional Reading


Suchman, et al (2017), ‘Tracking and Targeting: Sociotechnologies of (In)security’, Science, Technology and Human Values Volume: 42 issue: 6, page(s): 983-1002 (This is an introduction to a special edition, so you might want to read this first and other articles in the special edition that interest you).


(Also see his new book Drone: Remote Control Warfare (Cambridge: MIT Press))


Cybersecurity

Myriam Dunn Cavelty (2018), Cybersecurity Research Meets Science and Technology Studies, Politics and Governance , Volume 6, Issue 2, Pages 22–30

Simulation and Gaming


You can also access a film based on the book, also called *Militainment, Inc.*, through UCL library – warning there are some scenes of war violence – the sections entitled Clean War and Techno-fetishism (17 mins 30s to 41 mins) are the most relevant for this course.

Useful Material not specifically from an STS perspective:


Rosa Brooks, ‘What’s not wrong with drones?’, and ‘Take two drones and call me in the morning’, in Foreign Policy September 5th and 12th 2012. [http://www.foreignpolicy.com/articles/2012/09/05/whats_not_wrong_with_drones](http://www.foreignpolicy.com/articles/2012/09/05/whats_not_wrong_with_drones) [http://www.foreignpolicy.com/articles/2012/09/12/take_two_drones_and_call_me_in_the_morning](http://www.foreignpolicy.com/articles/2012/09/12/take_two_drones_and_call_me_in_the_morning)

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**Week 9**  
**After War: Who Counts the Dead?**

After war, casualties must be counted (but how?), weapons such as land mines or unexploded cluster munitions must be cleared (but how, and could their use have been prevented or controlled?) and the infrastructure essential to civilian life must be repaired (but why was it attacked in the first place?). The breaks the topic into three strands: Who watches the dead? Who knows the dead? Who counts the dead?
Seminar Readings


Additional Reading


(About attacking infrastructure as a theme of modern warfare.)

(Argues that the material body parts from bomb victims, and the way they are (mis)treated, are a way of ’instantiating’ (i.e. making concrete) abstract ideas such as victory in war)).

*Bureaucratization and Killing*


OR


War and Media


You can also access a film based on the book, also called Militainment, Inc, through UCL library – warning there are some scenes of war violence – the sections entitled Clean War and Techno-fetishism (17 mins 30s to 41 mins) are the most relevant for this course.

Coursework Assignments

Assignment 1. Review

By this stage of the MSc course you should be able to read, understand and start to provide your own evaluation of research articles that draw on STS approaches when dealing with war and security.

First read the chapter:


This is an up to date review of the ‘state of the art’ of research in STS and security. Perhaps wait until at least week 2 (after the class) of the course to begin reading it.

Select one research article or chapter (or whole book if you’re feeling ambitious) from the chapter bibliography at the end of the Vogel et al chapter on a topic that you are not intending to choose for your long essay. Avoid any short news items or very descriptive background pieces as there will be less to agree or disagree with. You must make this a different topic to your essay two topic (you are permitted some overlap, but it should mainly link to a different topic).

Write a 1000 (+/-10%) word critical review of the article/chapter/book.

- The review should have a title of your choosing, and you should also clearly state which piece you are reviewing. [don’t add this to the word count]
- You should also read at least 3-4 pieces from the most relevant topic on the reading list or material cited in the Vogel chapter as contextual material. You can also search out your own contextual material.
- The review should describe and explain the main argument(s) presented in the article/chapter/book. Your review should also leave space for critical discussion of the material presented in the piece (e.g. strengths, weaknesses, comparison with other literature on the topic, or with other approaches on the course, does it really achieve what it claims to have done?). Hint: It helps here to have one main message that runs through your review.
- Once you have cited your main review article/chapter/book for the first time, after that you can simply refer to the page number(s) in brackets instead of citing each time. Other citations to contextual reading should be fully cited (see standard referencing conventions such as Harvard or Chicago for in text and in bibliography formats).

Assignment 2. Essay

You may choose your own title in discussion with me or use (or adapt) one of the indicative essay questions at the end of the syllabus

Essays should be 3600-4000 words long, with references cited in the main text and a list of references at the end. Do not cite material in the end references that you have not used in the
main text. Essay font should be no smaller than 12 point type, essays should have page numbers, be 1.5 line spaced and include a word count at the end.

Please read the guidelines on how to write an essay. If you are not used to writing essays then you should also read chapter 5 of A. Northedge’s *The Good Study Guide*.

Essays must be submitted via Moodle/Turnitin.
In order to be deemed ‘complete’ on this module students must attempt both of the written assignments.

**Essay Questions**

These are indicative questions for your essays. If there are topics that interest you or you want to adapt a question to take a direction that is more in line with your specific interests, then please discuss with me during office hours.

1. How, if at all, are military technologies socially shaped? What, if any, are the limitations of the ‘social shaping’ approach?

2. Are scientists responsible for the weapons they create?

3. Are there better ways to think about the so-called dual-use dilemma than in terms of ‘dual-use’?

4. Does ‘tacit knowledge’ present a serious barrier to the proliferation of Weapons of Mass Destruction? [or you might want to focus on one type of weapon]

5. Is secret military science simply open science done behind closed doors?

6. How do security technologies ‘spread’ into everyday life? Do these new security technologies make daily life more or less secure?

7. “Just as science can free the innocent, it can also identify the guilty” (Romney cited in Jasanoff 2006). To what extent can DNA profiling and/or lie detectors live up to this expectation?

8. Critically discuss Sullin’s contention that ‘If you are a politician in a liberal democracy, then the technology of unmanned weapons is the answer to your dreams’.

9. “Mathematics is and are inseparable from politics” (Nelson 2015, p4). Critically discuss this claim in relation to counting casualties during and after war.