

HPSC3002 Science, Warfare & Peace

Course Syllabus

2012-13 session | Dr Jon Agar, Dr Brian Balmer |
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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 century. The course is organised around a number of 'big questions' about science, warfare and peace:

Course Information

Basic course information

Course website:	See Moodle Site
Moodle Web site:	search 'HPSC3002'
Assessment:	One essay, 50%, One exam 50%
Timetable:	www.ucl.ac.uk/sts/hpsc
Prerequisites:	'no pre-requisites', 'course designed for year 3 students'
Required texts:	[
Course tutor:	Dr Jon Agar, Dr Brian Balmer
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Office location:	22 Gordon Square, Room and Room 2.2
Office hours:	Balmer: Mon 12-1, Thurs 11-12 Agar: Tues 1-2, Thurs 3-4

Schedule

UCL Week	Topic	Date	Lecturer
20	What are the relationships between science, technology and war?	3/10	JA
21	How does STS study military technology?	10/10	BB
22	What are the relationships between war, media and technologies?	17/10	JA
23	Are scientists responsible for the weapons they create?	24/10	BB
24	Can nuclear weapons be controlled?	31/10	JA
25	Essay Abstract deadline	7/11	
25	Reading Week	7/11	
26	Can chemical and biological weapons be controlled?	14/11	BB
27	Can war be automated?	21/11	JA
28	What is the militarisation of civil life?	28/11	BB
29	What happens after war?	5/12	JA
	How will future wars be fought?	12/12	BB/JA
30	Essay deadline	14/12	

Assessments

Summary

	Description	Deadline	Word limit
1	Essay Abstract	11.59 pm Wed 7/11	250
2	Essay	11.59pm Fri 14/12	3000

Assignments

ESSAY TOPICS FOR SCIENCE, WARFARE & PEACE

Part 1. Abstract

An abstract/overview of your essay is due by **Wednesday 7 November 2012**.

You will need to choose one of the questions posed by us as titles to each weeks lectures, which does not need to be one we have yet covered in the lectures.

Within this framework we want you to focus on one particular way of answering the question. At this stage you will therefore need to think about what you will NOT be covering as much as what you will be covering. The weekly topic questions are very broad. To answer the question well in the form of an essay you will have to choose AND JUSTIFY a specific approach to answering the broad question.

For example for topic one “What are the relationships between science, technology and war?”, you might decide that science determines military technologies, or the reverse that the technologies are shaped by war. You might want to challenge some of the assumptions in the question. Your essay will then be a justification of the angle chosen, and plenty of discussion of examples of this angle, based on your reading.

You will need to have done some *preliminary* reading – the seminar reading and the essential examinable reading.

You should write a **250 word abstract/overview** of the topic you intend to cover. This is your justification and a sketch of possible examples.

This part of the assignment does not carry a mark but:

- (a) you will be given recognition when we mark the assignment for thinking of an interesting question
- (b) you will receive feedback on the abstract so that you know you are heading in the right direction for your essay (and for your question)

Part 2. Essay

Essays should be 3,000 (+/- 10%) 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 double-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.

In order to be deemed ‘complete’ on this module students must attempt both parts of the written assignment and attempt the exam.

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 century. The course is organised around a number of 'big questions' about science, warfare and peace:

- What are the relationships between science, technology and war?
- What intellectual tools help us study military technology?
- What is the relationship between war and the media?
- Are scientists responsible for the weapons they create?
- Can nuclear, chemical and biological weapons be controlled?
- Can war be automated?
- What happens after war?
- What is the militarisation of civil life?
- How will future wars be fought?

As well as thinking about how science, technology and warfare have shaped each other, we will also consider the changing role of the scientist in relation to the state. The course will also consider broader themes such as arms control, ethics, popular culture and the body in relation to war.

By the end of this course you should:

- Be able to apply critical thinking to understanding issues around science, technology, war and peace.
- Possess an understanding of the duties and responsibilities of scientists in relation to military research
- Have developed detailed knowledge of the history and governance of modern military technologies.

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" 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. Material in the teaching collection is marked **[TC nnnn]** in this outline and is usually available on-line through the library or in a few cases you will need to get the material from the issue desk. All of the seminar readings, unless otherwise noted, can be accessed electronically through the library.

There is also useful material kept in **Senate House Library** which you can obtain a library with your UCL Identity Card. You can access journals electronically, including recent editions of *Science & Public Policy*, which appears on this reading list.

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

There will be either two lectures or one lecture and seminar each week. Attendance at **both** is a course requirement. Anyone who misses more than four lectures **or** seminars will be asked to provide an explanation via their tutor. Anyone who fails to provide an adequate documented explanation may be declared INCOMPLETE for the course.

Reading list

[insert reading list here. Ensure you clearly differentiate between ESSENTIAL reading (i.e. they will be assessed on content) and ADDITIONAL reading (recommended extra reading, e.g. for an essay on that topic). Divide the reading by week/topic/essay etc]

Important policy information

Below are listed some important points of policy. Further details of all these policies can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook

Late submission of coursework

Penalties for late coursework submission are as follows:

- loss of 5 marks for work submitted less than 24 hours late
- loss of 15 marks for work submitted between 1 and 7 days late
- loss of all marks (i.e. work is graded 0) if submitted more than 7 days late

These rules are statutory and non-negotiable.

Coursework word limits

Penalties for over-length coursework are as follows:

- Assessed work should not be more than 10% longer than the prescribed word count. Assessed work with a stated word count above this maximum cannot be accepted for submission, but will be immediately returned to the student with instructions to reduce the word length. The work may then be resubmitted, except insofar as penalties for late submission may apply.
- If submitted work is subsequently found to have an inaccurately stated word count, and to exceed the upper word limit by at least 10% and by less than 20%, the mark will be reduced by ten percentage marks, subject to a minimum mark of a minimum pass assuming that the work merited a pass.
- For work which exceeds the upper word limit by 20% or more, a mark of zero will be recorded.
- Footnotes and endnotes **do** count as part of the word limit
- Bibliography, tables, pictures and graphs **do not** count as part of the word limit.

Extensions

If unforeseeable circumstances prevent the completion of a piece of coursework, students may request an extension to the set deadline. Please consult the STS Student Handbook for further guidance on acceptable grounds for requesting an extension. Extensions must be negotiated in advance with the course tutor. Students to whom STS is parent department may also request an extension from their Personal Tutor. No extension is considered official without written approval.

The request for extension form can be found at: www.ucl.ac.uk/sts/study

Plagiarism

The *UCL Student Handbook* defines plagiarism as “the presentation of another person’s thoughts or words or artefacts or software as though they were [your] own”. Students are expected to know the College and Department policies in detail and to avoid even the appearance of inappropriate behaviour. In the first demonstrated instance of plagiarism or other irregularities in this course, students normally will receive a 0 F for the course and will be referred to the department and College officials for further action. All course work is subject to scrutiny against past papers and other materials for irregularities. Electronic and other checks

will be conducted; see the *STS student handbook* for additional information.

Attendance

Regular attendance is mandatory.

Requirements to complete modules

Students are required to be 'complete' in all modules. Normally all assignments must be attempted in order for students to be considered complete. This is different from 'passing' a module which requires a minimum overall module mark of 40%.

Assessment and additional examiners

Assessed materials are marked by the course tutors. These provisional marks will be distributed to students at the first opportunity. To ensure fairness, materials subsequently are scrutinised by a second examiner within the Department, and a consensus is reached on these separate assessments. All assessed materials and the consensus marks are made available for scrutiny by an examiner external to UCL. Marks are considered final only after the Board of Examiners for Science and Technology Studies has approved them in their annual meeting near the close of Term three.

Disputed marks

Students must endeavour to discuss any grievances over marks informally with the course tutor in the first instance. If informal discussion fails to resolve the matter satisfactorily and there appears to be genuine and substantive grounds for appeal, the student should submit a written explanation of their grievance to the chair of the board of examiners. A final formal written appeal can be made to the College Registrar.

Mechanisms for student feedback

Students have a variety of means for commenting on the module and module tutor. These include written module evaluations at the end of term, regular lecture assessments offered by the module tutor, and in-session opportunities. Students are welcome to bring comments and criticisms to the module tutor in the first instance, by anonymous note if necessary, then to their personal tutor or the STS undergraduate tutor. The department schedules regular meetings of the Undergraduate Student Staff Consultative Committee to which all students are invited.

General Background Reading

These are readings that you would not necessarily expect to learn for the essay and exam, but may be worth reading quickly as they contain useful background material - particularly if you feel there is a gap in your knowledge.

John Lewis Gaddis, *The Cold War*, London: Penguin, 2007

A.W. Purdue, *The Second World War*, Basingstoke: Palgrave, 1999

Gerard de Groot, *The Bomb: A History of Hell on Earth*, London: Pimlico, 2005.

Jeanne Guillemin, *Biological Weapons: From State-Sponsored Programs to Contemporary Bioterrorism*, New York: Columbia University Press, 2005.

Kim Coleman, *A History of Chemical Warfare*, Basingstoke: Palgrave Macmillan, 2005

Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations*, New York: Basic Books, revised 2006

Jonathan Glover, *Humanity: a Moral History of the Twentieth Century*, London: Jonathan Cape, 1999

Week 1 3 October

What are the relationships between science, technology and war?

Introduction to course (BB).

Lecture (JA) will review some of the broad ways science has been seen to be a peaceful, aggressive or neutral activity. He will also review the main lines of argument concerning the relationships between technologies and warfare. Examples will include the stirrup, firearms, machine gun, aircraft and the atomic bomb. Some themes addressed include mass killing, impersonalisation, bureaucratization, and “decisive weapons”.

Seminar Reading:

None

Essential Examinable Reading

Alex Roland, ‘Science, technology, and war’, in Mary Jo Nye (ed.), *The Cambridge History of Science. Volume 5: The Modern Physical and Mathematical Sciences*, Cambridge: Cambridge University Press, 2003, pp.561-578.

Very useful, if compressed, summary of relationships between science, technology and war

Everett Mendelsohn, ‘Science, scientists and the military’ in John Krige and Dominique Pestre (eds.), *Science in the Twentieth Century*, Amsterdam: Harwood, 1997

Another overview.

David Edgerton, ‘Science and War’, in Olby et al (eds.), *The Companion to the History of Modern Science*, London, Routledge, 1990, pp.935 – 945.

Some useful insights on relationships between science and war.

Martin van Creveld, ‘The rise and fall of military technology’, *Science in Context* (1994) 7, pp.327-351.

Argues that low-tech, “low-intensity” warfare is returning to prominence [available electronically as electronic reading list at:
<http://ls-tlss.ucl.ac.uk/cgi-bin/displaylist?module=09HPSC3002>]

David Edgerton, ‘Significance’, ‘War’, and ‘Killing’ in *The Shock of the Old: Technology and Global History since 1900*, London: Profile Books, 2006.

Sceptical look at innovation

Additional Reading for Essays

Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution*, San Francisco: Harper & Row, 1980

For the argument that the version of the scientific method successful in the scientific revolution was masculine and destructive

Lynn White, *Medieval Technology and Social Change*, London: Oxford University Press, 1976.

For the stirrup case.

Zygmunt Bauman, 'Chapter 4: the Uniqueness and Normality of the Holocaust', in *Modernity and the Holocaust*, Cambridge: Polity Press, 1989.

Makes the challenging argument that the holocaust arose not from aberrations in German culture and society, but from normal and pervasive features of modern society, especially bureaucracy and scientific-technical rationality (If you're brave, dip into chapter 7 for a theoretical development of this argument.)

Anthony Giddens, "Capitalist Development and the Industrialization of War," in Giddens, *The Nation State and Violence*, Cambridge: Polity Press, 1985. TC 6207.

Sociological analysis of nature of modern warfare and its relationship to the development of capitalism and the state.

Elaine Scarry, *The Body in Pain: the Making and Unmaking of the World*, Oxford: Oxford University Press, 1985.

See chapter two for a discussion of the war images are sanitized.

John Ellis, *The Social History of the Machine Gun*, London: Pimlico, 1993

The machine gun exemplifies the industrialisation and depersonalisation of warfare.

Daniel Pick, *War Machine: The Rationalisation of Slaughter in the Modern Age*, New Haven: Yale University Press, 1993

On metaphors of war as a machine, and the lineage of mass produced killing to industrialized warfare.

Michael Adas, 'The Great War and the assault on scientific and technological measures of human worth', in *Machines as the Measure of Men: Science, Technology and Ideologies of Western Domination*, Ithaca: Cornell University Press, 1989, pp.345-401

First World War as cultural shock.

William H. McNeill, 'Chapter Nine: World Wars of the Twentieth Century', in *The Pursuit of Power: Technology, Armed force, and Society since A.D.1000*, Oxford: Blackwell, 1983, pp.307-345.

Tehnology just one of the factors behind the severity and nature of 20th century warfare.

Week 2 10th October

How Does STS Study Military Technology?

Lecture (BB): 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:

Weber, Rachel (1997) "Manufacturing Gender in Commercial and Military Cockpit Design," *Science, Technology and Human Values* 23: 235-53.

Essential Examinable Reading

Donald MacKenzie and Judy Wajcman, (eds.) *The Social Shaping of Technology* (2nd Edition). 'Military Technology. Introduction', 1999, pp.343-350.

If you have not taken the first year course: Introduction to Science Policy Studies, you should also read the introductory essay in the book (pp.3-27).

Additional Reading for Essays

B. Buzan and E. Herring, *The Arms Dynamic In World Politics*, Rienner, 1998 Chapters 2, 5-7.

Not specifically about social shaping, but general and accessible introduction to theories of the arms race.

Brian Rappert, Brian Balmer and J. Stone, 'Science, Technology and the Military: Priorities, Preoccupations and Possibilities', in E. Hackett et al (Eds), *The New Handbook of Science and Technology Studies*, Cambridge Mass: MIT Press, 2007.

Specific Case Studies Discussed in the Lecture:

Janet Abbate, 'Cold war and white heat: the origins and meanings of packet switching' in MacKenzie and Wajcman (eds.) *The Social Shaping of Technology* (2nd Edition), 1999, Chapter 25

On the origins of the Internet.

M. Armacost, 'The Thor-Jupiter Controversy' in MacKenzie and Wajcman (eds.), *The Social Shaping of Technology* (2nd Edition), 1999 Chapter 28.

Paul Forman, 'Behind Quantum Electronics: National security as basis for physical research in the United States, 1940-1960', *Historical Studies in the Physical and Biological Sciences* (1987) 18(1) pp.149-229

This seems like a huge article, most of it is footnotes though – skim it through to get the general message.

Harry Collins and Trevor Pinch, 'A clean kill?: the role of Patriot in the Gulf War', in *The Golem at Large: What you should know about technology*, Cambridge University Press, 1998

Ford, M (2009) 'Battlefield interpretations and the role of the imagination in the development of British infantry weapons, from the 1880s to the present day', in Gertsz, M (ed) *War Fronts: Interdisciplinary Perspectives on War, Virtual War and Human Security* available at: *Interdisciplinary.net*

<http://inter-disciplinary.net/ptb/www/www5/ford%20paper.pdf>

Bourne, M (2012), 'Guns don't kill people, cyborgs do: a Latourian provocation for transformatory arms control and disarmament', *Global Change, Peace & Security* Vol. 24, No. 1, February 2012, 141–163.

(Draws on actor-network theory in STS to analyse debates about disarmament)

Week 3 17 October

What are the relationships between war, media and technologies?

Lecture (JA): This session looks at the relationships between war and the media, and the technologies that form those media. We will consider the ways in which journalists have brought news of war back to the 'home front', enabling citizens both to 'do their bit for the war effort', and to criticise the conduct of war, making war an issue in the public sphere and a matter for public opinion. Three case studies will be examined: the Crimean War, the Vietnam War and the recent wars in Iraq.

Seminar Reading

Phillip Knightley, 1975/200, 'The deadly video game', in *The First Casualty: the war correspondent as hero and mythmaker from the Crimea to Kosovo* (London: Prion), chapter 19.

Additional Reading for Essays

Stephanie Markovits, 2008, Rushing into print: 'participatory journalism' during the Crimean War. *Victorian Studies* **50** (4), 559-586

Exploring the impact of the reporting of the Crimean War on public opinion on the home front

Daniel C. Hallin, 'The media, the war in Vietnam, and political support: A critique of the thesis of an oppositional media', *Journal of Politics* (1984) 46(1), pp 1-24.

Daniel C. Hallin, *The "Uncensored War": The Media and Vietnam*, UCP Press, 1989
By

Jane Chapman, 2005, *Comparative Media History, an introduction: 1789 to the present* (London: Polity), chapters 2, 5 and 6

Contextualises war reporting in media history more generally

Phillip Knightley, 1975/200, *The First Casualty: the war correspondent as hero and mythmaker from the Crimea to Kosovo* (London: Prion), chapters 1, and 18 onwards

A history of war reporting. The title refers to the saying that the first casualty of war is truth.

Martin Bell, 2008, The death of news. *Media, War and Conflict* **1** (2), 221-231

This former war reporter and MP laments the demise of war journalism, attributing the 'death of news' to the management of battlefield journalists by the military and the self-censorship by media organisations

Week 4 24th October

Are Scientists Responsible for the Weapons they Create?

Lecture (BB). 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:

Steven Shapin, 'Don't let that crybaby in here again', London Review of Books, 7 September 2000, online at: <http://www.lrb.co.uk/v22/n17/shap01.html>

Daniel Charles, 'Chapter 9: "The greatest period of his life"', in *Between Genius and Genocide: the Tragedy of Fritz Haber, Father of Chemical Warfare*, London: Jonathan Cape, 2005

Essential Examinable Reading

Charles Thorpe, *Oppenheimer: The Tragic Intellect*, Chicago: University of Chicago Press, 2007, chapters 6 and 7.

Analyses physicist J. Robert Oppenheimer's views on the moral responsibility of the scientist, his initial opposition to the development of the hydrogen bomb, and the political backlash he faced during the McCarthy era.

Additional Reading/Watching for Essays

John Rubin Productions (2007), 'The Living Weapon' – Emmy-winning documentary on the history of biological warfare: <http://www.pbs.org/wgbh/amex/weapon/program/index.html>

Kai Bird and Martin J. Sherwin, *American Prometheus: the Triumph and Tragedy of J. Robert Oppenheimer*, London: Atlantic, 2005.

Big biography. Check out Chapter 24: "I feel I have blood on my hands"

Brian Balmer, 'Killing "Without the Distressing Preliminaries": Scientists' Defence of the British Biological Warfare Programme', *Minerva* (2002) 40, pp57-75

Hugh Gusterson, *Nuclear Rites: A Weapons Laboratory at the End of the Cold War* Berkeley: University of California Press, 1998 (See Chapter 3).

Anthropological investigation of nuclear weapons laboratories.

Silvan S. Schweber, *In the Shadow of the Bomb: Oppenheimer, Bethe and the Moral Responsibility of the Scientist*, Princeton University Press, 2000.

This book is reviewed in the Shapin reading

R.R. Colwell and R. Zilinskas, 'Bioethics and the Prevention of Biological Warfare', in Zilinskas (ed.) *Biological Warfare: Modern Offense and Defense*, Rienner, 2000.

M. Somerville and R. Atlas, 'Ethics: A Weapon to Counter Bioterrorism', *Science* (2005) 307: 1881-1882

Looks at responsibilities of civilian rather than defence scientists.

B. Paskins, 'The Responsibilities of Defence Scientists', in Freedman, L (ed.) *War* Oxford: Oxford University Press, 1994

Lawrence Badash, *Scientists and the Development of Nuclear Weapons: from Fission to the Limited Test Ban Treaty, 1939-1963*, Atlantic Highlands: Humanities Press, 1995

Kempener, S et al "Forbidden Knowledge: Public Controversy and the Production of Non-Knowledge", *Sociological Forum*, 26(3), 2011, 475-500.

More General Framework for thinking about whether individuals or their context lead them into creating weapons:

Cropley, D (et al) (eds) (2010), *The Dark Side of Creativity* (Cambridge: CUP)

Zimbardo, P (2008), *The Lucifer Effect: How Good People Turn Evil* (Rider) (Gives an account of the 'Stanford Prison' experiment)

Guillemin, J (2011), *American Anthrax: Fear, Crime, and the Investigation of the Nation's Deadliest Bioterror Attack* (Written with a popular audience in mind but by an academic sociologist – focus on the character of the FBI's main suspect Bruce Ivins).

Human Experiments and the Military

Tal Bolton, "“Never Volunteer for Anything”: The Concept of the “Volunteer” in Human Experimentation During the Cold War", *University of Sussex Journal of Contemporary History* (2005) 9, available at http://www.sussex.ac.uk/history/documents/9_bolton_never_volunteer_for_anything.pdf

Susan Lindee, 'The Repatriation of Atomic Bomb Victim Body Parts to Japan: Natural Objects and Diplomacy,' *Osiris* (1999) 13, pp.376-409.

Jonathan D. Moreno, *Undue Risk: Secret State Experiments on Humans*, London: Routledge, 2001. (All useful, but esp Chapters 3, 5, 6, 7)

Week 5 31st October

Can Nuclear Weapons be Controlled?

Lecture (JA): the lecture will look at the forces driving the proliferation of nuclear weapons since the Manhattan Project, and will ask whether nuclear weapons can be controlled.

For the seminar we hope to be joined by Sandy Butcher (Pugwash UK)

Seminar Reading:

Browse the following websites. Take notes on the activities, past and present of the Pugwash movement. What are the advantages and disadvantages of Pugwash's approach to peacemaking? On the basis of your notes, compose three questions you would like answered about Pugwash.

<http://www.pugwash.org/>

<http://www.pugwash.org/uk/>

[Additional Reading for Essays

Henry T. Nash, "The Bureaucratization of Homicide," in E. P. Thompson ed., *Protest and Survive* (Harmondsworth, Penguin: 1980), 62-74. [TC 6262] (An insider's account of the worldview of the nuclear strategy bureaucrat.

Lawrence S. Wittner, "Gender Roles and Nuclear Disarmament Activism, 1954-1965," *Gender and History* 12 (1) (April 2000), 197-222. Available via Athens.

Richard Taylor, *Against the Bomb: the British Peace Movement, 1958-1965*, Oxford: Clarendon Press, 1988.

Ian Welsh, *Mobilising Modernity: the Nuclear Moment*, London: Routledge, 2000.

For anti-nuclear movements in the UK.

Lawrence S. Wittner, *The Struggle against the Bomb*, three volumes, Stanford: Stanford University Press.

Lawrence Freedman, *The Evolution of Nuclear Strategy*, Basingstoke: Palgrave Macmillan, 2003.

Scott D. Sagan, Kenneth N. Waltz, *The Spread of Nuclear Weapons: a Debate Renewed*, with new sections on India and Pakistan, terrorism, and missile defense, New York: W.W. Norton & Company, 2003.

Carol Cohn, 'Sex and death in the rational world of defense intellectuals', *Signs* (1987) 124, pp.687-718

An excellent discussion of the way that language shapes how nuclear weapons are dealt with

Lynn Eden, *Whole World on Fire: Organizations, Knowledge and Nuclear Weapons Destruction*, Ithaca: Cornell University Press, 2006.

N. Tannenwald, 'The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use', *International Organisation* (1999) 43(3), pp.433-468.

Week 6 November 7th

READING WEEK

Week 7 14th November

Can Chemical and Biological Weapons Be Controlled?

Lecture (BB): 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?

Seminar Readings:

Vogel, Kathleen M. (2008), 'Framing biosecurity: an alternative to the biotech revolution model?', *Science and Public Policy*, Volume 35, Number 1, February 2008 , pp. 45-54(10).

Essential Examinable Reading

I. Kenyon, 'Chemical Weapons in the Twentieth Century: their Use and their Control', *The CBW Conventions Bulletin* No.48 (June 2000) pp.1-15. Available at <http://www.fas.harvard.edu/~hsp/bulletin/>

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

Additional Reading for Essays

Tucker, J (2012), *Innovation, Dual-Use and Security: Managing the Risks of Emerging Biological and Chemical Technologies* (Cambridge MA: MIT Press) (Chapters 1 and 2).(E-book ordered for the library).

Kelle, A (2009) 'Synthetic Biology and Biosecurity. From low levels of awareness to a comprehensive strategy', *EMBO Reports*, Vol.10, Special Issue, S23-S27

Anon. (2009), 'Hacking goes Squishy', *The Economist* (3 September) Vol 392 no.8647 pp.30-31 [available online] – on the potential of 'biohackers'.

Donald MacKenzie and Graham Spinardi, 'Tacit knowledge, weapons design, and the uninvention of nuclear weapons' *American Journal of Sociology* 101(1) (1995), pp.44-99. [Not about CBW but a seminal STS discussion of 'tacit knowledge' and arms control]

C. McCleish, 'Science and Censorship in an Age of Bioweapons Threat', *Science as Culture* (2006) 15(3), pp.215-36. Examines the way in which threat is 'framed' in terms of dual-use.

Jez Littlewood, 'Managing biological disarmament: the UK experience' *Science and Public Policy* 35(1) (2008), pp.13-20. [UCL and Senate House Library]

Balmer, B (2006), 'A Secret Formula, A Rogue Patent and Public Knowledge about Nerve Gas: Secrecy as a Spatial-Epistemic Tool', *Social Studies of Science* 35(5) (2006) 691-722. [Case study and discussion of what makes something dangerous, from an STS perspective]

McLeish, c and Balmer, B (2012) 'Discovery of the V-series nerve agents during pesticide research', in Tucker, J (ed) Tucker, J (2012), *Innovation, Dual-Use and Security: Managing the Risks of Emerging Biological and Chemical Technologies* (Cambridge MA: MIT Press) (Chapters 1 and 2).(E-book ordered for the library).

Julian Perry Robinson, 'Chemical-weapons proliferation in the Middle East', in Efraim Karsh, Martin S Navias and Philip Sabin (editors), *Non-Conventional-Weapons Proliferation in the Middle East*, Oxford: Clarendon Press, 1993, pp 69-98.

On the military and political circumstances under which CW weapons might be employed) [TC 2359]

Tucker JB (1994), 'Dilemmas of a Dual-Use Technology: Toxins in Medicine and Warfare', *Politics and the Life Sciences* Vol.13 No.1 pp51-62. (Wellcome Library)

Week 8 21st November

Can War Be Automated?

Lecture (JA): 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:

Robert Sparrow, 'Predators or Plowshares? Arms control of robotic weapons', *IEEE Technology and Society* (Spring 2009) pp. 25-29. Available via:

<http://www.sevenhorizons.org/docs/SparrowPredatorsorPlowshares.pdf>

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/2012/09/12/take_two_drones_and_call_me_in_the_morning

Essential Examinable Reading

Paul Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, Cambridge MA: MIT Press, 1994, pp. 3-15.

Additional Reading for Essays

Armand Mattelart, *The Information Society: an Introduction*, London: Sage, 2003.

Information Warfare: Its Application in Military and Civilian Contexts

Authors: Blaise Cronin; Holly Crawford *The Information Society*, Volume 15, Issue 4

November 1999 , pages 257 - 263

T Yoshihara, 'Chinese information warfare: a phantom menace or emerging threat?' (2001).

Available via: [http://www.dtic.mil/cgi-](http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA397266)

[bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA397266](http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA397266)

Robert Sparrow, 'Building a Better WarBot: Ethical Issues in the Design of Unmanned Systems for Military Applications', *Science and Engineering Ethics*

15(2), pp. 169-187

Dorothy Denning, *Information Warfare and Security*, Harlow: Addison-Wesley, 1999.

Week 9 28th November

What is the militarisation of civil 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:

Neyland, D (2010), 'Mundane terror and the threat of everyday objects', in Aas, KF *et al* (eds), *Technologies of Insecurity: The Surveillance of Everyday Life* (London: Routledge) (On Moodle)

Additional Reading for Essays

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

Malcolm Dando, *A New Form of Warfare: the Rise of Non-lethal Weapons*, London: Brassey's, 1996.

Rappert, B. 2001. "Scenarios on the Future of Non-lethal Weapons" *Contemporary Security Policy* 22(1): 50-74

Rappert, B. 2001. "The Distribution and the Resolution of the Ambiguities of Technology; or Why Bobby can't Spray" *Social Studies of Science* August: 557-592.

Kelle, A (2007) 'The Securitization of International Public Health. Implications for Global Health Governance and the Biological Weapons Prohibition Regime', in *Global Governance*, Vol.13, No.2, pp.217-235

Cooper, M (2006), 'Preempting Emergence: The Biological Turn of the War on Terror', *Theory, Culture and Society*, Volume 23.4, July 2006, pp. 113-135.

Dannreuther, R (2007) *International Security the Contemporary Agenda* – chapter 3 is a good, short and clear tour of International Relations theory and post-Cold war security. [.pdf of this chapter on Moodle]

James der Derian, *Virtuous War: Mapping the Military-Industrial-Media-Entertainment Network*, Boulder, CO: Westview, 2001 Engaging academic travelogue through the world of military simulation and its links to the entertainment industry

Week 10 5th December

What Happens After War?

Lecture (JA): 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?)

Seminar Reading/ Essential Examinable Reading:

Stephen Graham (2005), 'Switching cities off', *City* 9(2): 169-84

About attacking infrastructure as a theme of modern warfare.

Additional Reading for Essays

Richard Price, 'Reversing the Gun Sights: Transnational Civil Society Targets Land Mines', *International Organization* 52(3) (1998), pp. 613-644.

<http://www.jstor.org/stable/2601403>

Brian Rappert and Richard Moyes, 'The prohibition of cluster munitions: setting international precedents for defining inhumanity', *The Nonproliferation Review* 16(2) (2009), pp. 237-256

John Stone, 'Technology and the problem of civilian casualties in war', in Brian Rappert (ed.), *Technology and Security: Governing Threats in the New Millennium*, Basingstoke: Palgrave Macmillan, 2007, pp.133-151

Looks at how different organisational factors resulted in very different assessments by groups of defence planners of the damage that would be caused by a nuclear attack.

Week 11 12th December

How Will Future Wars Be Fought?

Lecture (JA and BB): in the last lecture/seminar we will review trends in science, warfare and pace in the 21st century

Seminar Reading:

Scan recent newspapers and journals and bring along to class three articles relating to the changing character of twenty-first century warfare.

Essential Examinable Reading

We will watch in class: 'PW Singer on military robots and the future of war', TED talk.
http://www.ted.com/talks/pw_singer_on_robots_of_war.html

Additional Reading for Essays

If you want to see how US Air Force recruits are being trained in thinking about future wars, have a browse of:

<http://www.au.af.mil/au/awc/awcgate/awc-futr.htm>

P.W. Singer, 'Corporate Warriors: The Rise of the Privatized Military Industry and Its Ramifications for International Security', *International Security* (2001/02) 26(3), pp.186-220

Susan L. Carruthers, 'New media, new war', *International Affairs* 77 (July 2001), pp. 673-681.

This is an essay review of three books that identify changing trends in 21st century war

Kenneth R. Timmerman, *The Death Lobby: How the West Armed Iraq*, Boston: Houghton Mifflin, 1991

Where did Saddam acquire the products and know-how necessary to build his war machine?

Richard P. Hallion, *Storm over Iraq: Air Power and the Gulf War*, Washington : Smithsonian Institution Press, 1992

Rather gung-ho analysis of new technologies in the First Gulf War.

Special Issue of *History and Technology* (2003) 19(1)

Historians of technology reflect on 9/11.

<http://www.guardian.co.uk/technology/2007/sep/05/hacking.internet>

A useful place to start for thoughts and examples of cyber-warfare.

B. Durodie, 'Facing the Possibility of Bioterrorism', *Current Opinion in Biotechnology* (2004) 15: 264-268

Good, provocative and short assessment of the threat from bioterrorism

Andrew Mack, 'Why Big Nations Lose Small Wars: The Politics of Asymmetric Conflict', *World Politics* (1975) 27(2), pp.175-200.

An article about why big nations lose small wars.

Wolf-Meyer, M (2009), 'Fantasies of Extremes: Sports, War and the Science of Sleep', *BioSocieties* 4:257-271.

Chris Hables Gray, 'Posthuman Soldiers in Postmodern War', *Body and Society* (December 2003) 9(4), pp. 215-226.

ESSAY TOPICS FOR SCIENCE, WARFARE & PEACE

Part 1. Abstract

An abstract/overview of your essay is due by **Wednesday 7 November 2012**.

You will need to choose one of the questions posed by us as titles to each weeks lectures, which does not need to be one we have yet covered in the lectures.

Within this framework we want you to focus on one particular way of answering the question. At this stage you will therefore need to think about what you will NOT be covering as much as what you will be covering. The weekly topic questions are very broad. To answer the question well in the form of an essay you will have to choose AND JUSTIFY a specific approach to answering the broad question.

For example for topic one “What are the relationships between science, technology and war?”, you might decide that science determines military technologies, or the reverse that the technologies are shaped by war. You might want to challenge some of the assumptions in the question. Your essay will then be a justification of the angle chosen, and plenty of discussion of examples of this angle, based on your reading.

You will need to have done some *preliminary* reading – the seminar reading and the essential examinable reading.

You should write a **250 word abstract/overview** of the topic you intend to cover. This is your justification and a sketch of possible examples.

This part of the assignment does not carry a mark but:

- (a) you will be given recognition when we mark the assignment for thinking of an interesting question
- (b) you will receive feedback on the abstract so that you know you are heading in the right direction for your essay (and for your question)

Part 2. Essay

Essays should be 3,000 (+/- 10%) 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 double-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*.