The Hebrew University of Jerusalem

Syllabus

Science technology and war - 58323

Last update 27-07-2021

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: International Relations

Academic year: 0

Semester: Yearly

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Or Rabinowitz

Coordinator Email: or.rabinowitz-batz@huji.ac.il

Coordinator Office Hours: Wednesdays, 11:30-12:30, room 5309.

Teaching Staff:

Dr. Or Rabinowitz

Course/Module description:

The course 'Science, Technology and War' will examine how developments in science, technology and human knowledge in general effect war in human civilization, starting with the ancient mounted warriors to today's cyber warfare. From a theoretical perspective the course will focus on technological determinism and its various approaches and the philosophical questions which arise from it to discuss questions such as: what is war and is technology necessary for the conduct of war? Does technology determine the motions of war? How have scientific developments such as the invention of gun powder, the scientific revolution, the industrial revolution, the nuclear revolution, etc. affected the conduct of war? How will developments in communications, satellite technology and 'cyber' effect the future of warfare, and what is the role of technology in Israel's strategic thought?

Course/Module aims:

The course aims to examine how science and technology have influenced the evolution of war in human civilization, and how they are affected by the social context in turn.

Learning outcomes - On successful completion of this module, students should be able to:

- Interpret the effects of the scientific-technological revolutions on warfare in different settings.
- Categorize and compare the major scientific developments which shaped warfare in recent centuries.
- Define the relevant terms used in the academic discourse in this field.
- Critically discuss the examined theoretical approaches in general, and technological determinism specifically.
- Understand the distinction between the two approaches which comprise of 'technological determinism'.

Attendance requirements(%):

100

Teaching arrangement and method of instruction: In class lectures.

Course/Module Content:

1. What is war and is it an inseparable part of human nature?

2. What is technological determinism? Soft versus hard approach.

3. Applying technological determinism on the phenomenon of war and when does a revolution in military affairs take place?

4. Early days of civilization, antiquity, and early middle ages.

5. Science and war in the middle ages, the gun powder revolution and the rise of professionalism.

6. Science and war in the 18th century: Copernicus, the age of enlightenment and the Napoleonic wars.

7. Science and war in 19th century: the rise of nationality, the industrial revolution and the American civil war.

8. Science and technology in WW1, part I. (Conventional weapons)

9. Science and technology in WW1, part II. (Conventional weapons)

10. Science and technology in WW2. (Conventional weapons)

11. The ballistic missile and nuclear revolution

12. Chemical and Biological warfare in the 20th century.

13. the information revolution and the RMA

14. Cyber warfare.

15. The technological dimension in Israel's strategic thinking.

16. Missile warfare – game changing technology?

17. In technology's captivity: issues arising from technological reliance.

18. The West and the rest: Technological determinism and competing explanations.

<u>Required Reading:</u>
1. What is war and is it an inseparable part of human nature?
- Efraim Inbar, 'Basic concepts in IR – War', Open University, 1998. Pp 5-50.
- Thomas Hobbs, Leviathan, [in Hebrew], Magness publishing, 1978, chapter 13.

- Marvin Harris, 'Cannibals and Kings', in Hebrew, Vapoalim press, 1980, 00 38-51.
- Azar Gat, "Chapter 2: Peaceful or War like; did Hunter Gatherers fight?", pp. 11-36 in: 'War in human Civilization', UK: Oxford University Press, 2006

2. What is technological determinism? Soft versus hard approach.
- Leo Marx and Merrit Roe Smith, Introduction, pp ix-xiv, in: Merritt Roe Smith and Leo Marx, eds., Does Technology Drive History? The Dilemma of Technological Determinism (Cambridge, Mass., 1994).
- Robert L. Heilbroner, 'Do machines make history?' 53-65, in: Merritt Roe Smith and Leo Marx, eds., Does Technology Drive History? The Dilemma of Technological Determinism (Cambridge, Mass., 1994).

3. Applying technological determinism on the phenomenon of war and when does a revolution in military affairs take place?
- Yehoshaphat Harkavy, 'War and Strategy', (Hebrew), Ma'arachot 1990, pp. 467-472.
- Martin van Creveld, 'Technology and War', New York: the free press, 1989. Pp 1-6. The Dynamics of Military Revolution, 1300-2050, MacGregor Knox, Williamson Murray (Eds), UK: CUP, 2001. Chapter 1.
- Alvin Toffler and Heidi Adelaide Toffler, 'War and Anti-War: Making Sense of Today's Global Chaos' , Grand Central Publishing (1995), pp 41-104.

4. Early days of civilization, antiquity, and early middle ages.
- John Keegan, 'the history of warfare', (Hebrew), Dvir, 1996, pp 116-134. 171-151. Van Crefeld, pp 9-24, 25-35.
- Michael Howard, War in European History, Maarchot, 1985. (Hebrew), chapter 2, 9-29.

5. Science and war in the middle ages, the gun powder revolution and the rise of professionalism.
Van Crefeld, pp 81-98, 137-152.
Henry Vaserman, 'People, Nation, Patria', Open University, 2008 (Hebrew), pp. 230-269.

6. Science and war in the 18th century: Copernicus, the age of enlightenment and the Napoleonic wars.
Michael Howard, pp 88-106, 153-156
Ben Ami Sharpstein, 'the history of philosophy from the renaissance to Kant', Open University Press, 1978 (Hebrew), pp 12-18, 25-31.

7. Science and war in 19th century: the rise of nationality, the industrial revolution and the American civil war.

-Michael Howard, 107-128.
Van crefeld, 155-160,
Knox and Murray, 89-107.

8. Science and technology in WW1, part I. (Conventional weapons)
Paul Kenndy, the rise and fall of the great powers (Hebrew), Dvir, 1992, pp 246-261.

Van Creveld, pp 153-179

9. Science and technology in WW1, part II. (Conventional weapons)
Michael Howard, 129-149.
Van Creveld, 183-211.

10. Science and technology in WW2. (Conventional weapons)
Van Creveld, chapters 12, 13, 14 (on WW1).
Stuart Cohen, the diplomatic history of the 20th century, Open University,Vol 3, pp 175-178.
Azar Gat, 'the development of military thought in the 20th century' (Hebrew), Misrad Habitachon, 49-57.

11. The ballistic missile and nuclear revolution
- Shimon Yitach, 'missiles and atomic weaponry' (Hebrew), Maarchot, 1959, pp 4-22.
- Meir Pail, the bombing of Hiroshima and Bagasaki, Zmanim 19, 1985.
-Avner Cohen, humanity in the shadow of the atom (Hebrew), Zmanim 19, 1985.
- Azriel Lorber, the road to nuclear weapons, Maarchot 440, 88-90.

12. Chemical and Biological warfare in the 20th century.
- Joseph Cirincione, Jon B. Wolfsthal, Miriam Rajkumar. Deadly Arsenals: Nuclear, Biological, and Chemical Threats (second edition), Carnegie Endowment, New-York, 2005. "Chapter 4: Biological and Chemical Weapons, Agents, and Proliferation", pp 57-67.
- Shai hazkani, 'When the Us had chemistry with Saddam', Maarchot 424.

13. the information revolution and the RMA
- Isaac ben Israel, 'the RMa and the Iraq war' in: After the War in Iraq: Defining the New Strategic Balance, Edited by Shai Feldman and Moshe Grundman, Sussex University Press, 2003.
- Isaac Ben Israel, 'Security, technology and the future battlefield', in: the texture of security, ed. Haggai Golan, Maarchot, 2001, (Hebrew),pp 269-237.
- Avi Kober, 'war and the battlefield in the future', in: the texture of security, ed. Haggai Golan, Maarchot, 2001, (Hebrew), 237-268.
- Isaac Ben Israel, 'back to the future', (Hebrew), Maarchot 329, 1993.

14. Cyber warfare.
- Lior Tabensky, 'warfare in cyber space: basic concepts', (Hebrew), Military and Strategy, Vol 3:1, May 2011, 65-80.
- Isaac Ben Israel, information warfare, Maarchot 369, 2000, pp 18-25.
Paikowsky, D., and Baram, G., "Space Wars: Why our space systems need an upgrade?", Foreign Affairs, (January 7, 2015), Available at: http://www.foreignaffairs.com/articles/142690/deganit-paikowsky-and-gil-baram/space-wars
- Thomas Rid, Cyber War Will Not Take Place, The Journal of Strategic Studies, Vol. 35, No. 1, 5–32, February 2012

15. The technological dimension in Israel's strategic thinking.
- Isaac Ben Israel, 'Israel's security conception', Misrad Habitachon, 2013. Pp 19-58
- Ari Bar-El, the leader, the scientists and the war, Ben Gurion and the establishment of the science corp', Israel 15, 2009. 67-92.
Zaki Shalom, Between Dimona and Washington, Ben Gurion University Press, 2004.

16. Missile warfare – game changing technology?
- Isaac Ben Israel, pp 116-124
- Meir Finkel, 'Irom dome – the new Maginot line? Maarchot 461, 2015.
- David Ivri, Eli Levite, 'surface to surface ballistic tactical missiles – the threat the response from the Israeli perspective, Maarchot 356-357, 1998, pp 5-11.

17. In technology's captivity: issues arising from technological reliance.
- Dotan Drok, 'in technology's captivity', Maarchot 422, pp 40-43.
- Nir Solomon, 'When the robot will think for us', Maarchot 433, pp 78-83.
- Uri Bar Yosef, 'The special means that were not used and the intelligence failure of the Yom Kippur War', Maarchot 448, pp 46-53.
- Ed Pilkington, 'US nearly detonated atomic bomb over North Carolina – secret document', The Guardian, 20 September 2013, available at: http://www.theguardian.com/world/2013/sep/20/usaf-atomic-bomb-north-carolina-1961

18. The West and the rest: Technological determinism and competing explanations.

- Niall Ferguson, Civilization: the west and the rest, Penguin Books, 2012.

- Jared M. Diamond, Guns, Germs, and Steel: The Fates of Human Societies, W. W. Norton & Company, 1999.

Additional Reading Material:
The Dynamics of Military Revolution, 1300-2050, MacGregor Knox, Williamson Murray (Eds), UK: CUP, 2001.

Course/Module evaluation:

End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 70 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 30 %
paper

Additional information:

The final grade of this course is composed of two papers, one handed in at the end of each semester. The paper of the first term will reflect 30% of the final grade, the paper at the end of the year will reflect 70% of the final grade.