Understanding Military Technology 2002

Syllabus

SAIS 660.774, Thursday 0800-1000, Rome 200

Purpose

This course aims to develop students’ ability to analyze military technology, that is: to identify and comprehend the central technical facts; to discern patterns in the evolution of such technologies; to understand how component technologies become parts of larger systems; to explore how military organizations vary in their exploitation of the same basic technologies; and finally, to appreciate the nature of technological interaction among competing organizations. The course also aims to teach students how to present technical matters to a lay audience clearly and concisely, orally and in writing, and to develop various group work skills. Strategy & Policy is not a prerequisite, but strongly recommended. No technical background required.

Course requirements and grading

Student work will center on a Defense Science Board task force simulation. Students will be divided into groups of four: each group will have a combination of collective and individual assignments. Grading will be as follows: 25% class participation; 25% individual assignments (one briefing and one memorandum); 50% collective work. There will also be one pass/fail quiz in week #5. There will be no final exam, but depending upon student interest there may be a field trip.

1. Concepts (24 January)

General readings


2. Design philosophy (31 January)

General readings


Case: tank design 1940-43
3. Tradeoffs  (7 February)

General readings


Exercise: designing an aircraft carrier; to be distributed

4. Innovation  (14 February)

General readings


Cases: the laser guided bomb; "Window"


5. Measure/countermeasure  (21 February)

General readings


Case: Antisubmarine Warfare in the North Atlantic
6. Obsolescence & technological surprise  (28 February)

General readings

Martin van Creveld, Technology and War, Chapter 5, "Irrational Technology," pp. 67-78. 12 pages.

Cases: The 75 and Jutland


7. Invisible technologies  (7 March)

General readings

Find a description of radar, being prepared to identify the basic concept, plus the following terms: frequency, beam width, bands, Doppler effect, pulse, continuous wave, synthetic aperture, sidelobe. In addition to various sources on the Web, see P. S. Hall et al., Radar (London: Brassey’s, 1991) or the entries in Trevor N. Dupuy, International Military and Defense Encyclopedia (Washington: Brassey’s, 1993), or best of all, Rebecca Grant, “The Radar Game: Understanding Stealth and Aircraft Survivability.”

Case: training superiority and training surprise

8. Systems engineering  (14 March)

General readings

Thomas P. Hughes, Rescuing Prometheus (New York: Pantheon Books, 1998), Chapters 1, 3, 7, pp. 3-14, 69-140, 301-306.

Briefings: DSB progress reports

9. The unromantic stuff: logistics, command, control, and communications  (28 March)

General readings


Note: no class on April 4th

10. Low tech vs. high tech  (11 April)

General readings

Case: electronic warfare in Vietnam


12. DSB briefings (18 April)

13. DSB briefings (25 April)