

NAVAL POSTGRADUATE SCHOOL
Monterey, California

*Department of Electrical &
Computer Engineering*

4 May 1994

Electronic Systems Engineering (590)
Educational Skills Requirements

Mathematics: The officer will have a thorough knowledge of mathematical tools which are intrinsic to electrical and computer engineering, including, but not limited to differential equations, vector analysis, linear algebra, probability, numerical analysis, and Fourier and Laplace methods.

Engineering Science and Design: To acquire the requisite background needed to meet the other military education requirements, the officer will acquire proficiency in modern physics, electromagnetics, electronic devices and circuits, system theory, and modern electronic system design; also in other appropriate fields such as underwater acoustics, dynamics, fluid mechanics and thermodynamics which provide the requisite breadth to a military engineering education.

Computers: The officer will have a sound understanding of computer hardware, software, and their integration into military systems including programming in higher order languages, digital logic circuits, and microprocessor applications.

Electronic and Electrical Engineering: In order to provide officers skilled in the application of electronic systems to military needs, the officer will have competence in the broad area of electrical engineering including circuits, electronics, fiber optics, computer communications networks, and systems analysis. The officer will select elective courses to obtain breadth in his/her understanding of military electronic systems. Additionally, to achieve depth of understanding, the officer shall specialize in one of the following areas: (a) military communication systems as applied to electronic counter countermeasures, low probability of intercept systems, low probability of detection systems, and other military problems; (b) guidance, navigation, and control systems; (c) radar, electro-optic, and electronic warfare systems; (d) high performance computer systems including advanced integrated circuits, parallel and distributed systems, and reliable real-time military platforms; (e) signal processing systems as applied to surveillance, underwater acoustic data acquisition and processing, imaging and target location, and other military issues; (f) total ship systems power engineering; (g) joint services electronic warfare; (h) signals intelligence.

System Design and Synthesis: The officer will have a sound understanding of engineering principles utilized in engineering system design, particularly as they relate to military systems, including establishment of system-related objectives and criteria.

Conducting and Reporting Independent Investigation: The officer will demonstrate the ability to conduct an independent investigation on a Navy and/or DOD relevant electronic systems problem, to resolve the problem, and to present the results of the analysis in both written and oral form.

Joint and Maritime Strategic Planning: American and world military history and joint and maritime planning including the origins and evolution of national and allied strategy; current

American and allied military strategies which address the entire spectrum of conflict; the U.S. maritime component of the National Military Strategy; the organizational structure of the U.S. defense establishment; the role of the Commanders of the Unified and Specified Commands in strategic planning; the process of strategic planning; joint and service doctrine, and the roles and missions of each in meeting national strategy.