2011-2013 EDUCATIONAL SKILLS REQUIREMENTS
ELECTRICAL SYSTEMS AND ENGINEERING
5300P
590

1. Curriculum Number: 590

2. Curriculum taught at NPS

3. Students are Fully Funded

4. Curriculum Length in Months: 24

5. Months the program starts: Jan, Mar, Jun, Sep

6. APC Required: 323

7. Community Managers have agreed to allow billets to be coded for 590 and Officers to be educated for this curriculum.

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

9. 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, electromagnetic, electronic devices and circuits, system theory, modern electronic system design, and integrated electrical power systems and their controls. In addition, proficiency will be gained in other appropriate fields, such as underwater acoustics, dynamics, fluid mechanics or thermodynamics that provide the requisite breadth to a military engineering education.

10. Cyber Networks and Physical Infrastructures: The officer will have a sound understanding of cyber infrastructure systems and technologies of interest to the military. Knowledge will include but not be limited to cover copper and fiber media networks, telecommunication networks and signaling, the Internet and enterprise networks, wireless and cellular networks, and spaced based networks. Additionally, officers will gain an understanding of control and overlay networks such as Supervisory Control and Data Acquisition (SCADA) systems and the National power grid. In addition, the officer will have introductory knowledge of computer hardware and their integration into military systems.

Enclosure (3)
11. **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, computer and communications networks, and systems engineering. To achieve depth and breadth of understanding, the officer shall specialize in a minimum of two from the following areas: (a) Communication Systems (including electronic counter-counter measures, low probability of intercept systems, low probability of detection systems, and other military issues) (b) Guidance, Navigation, and Control Systems (c) Microelectronics and Power Systems (d) Signal Processing Systems (as applied to surveillance, underwater acoustic data acquisition and processing, imaging and target location, and other military issues) (e) Computer Systems (including advanced integrated circuits, networking and data communications, parallel and distributed systems, reliable real time military platforms) (f) Sensors (including radar, electro-optical, electronic and information warfare systems) (g) Network Engineering (including wireless networks, sensor networks, high speed data networking, and telecommunication systems) (h) Cyber Systems (including a rigorous treatment of the cyber network and physical infrastructure, cyber system vulnerabilities and risk assessment, telecommunications systems engineering, trustworthy hardware, and Internet engineering)

12. **System Engineering**: The officer will have a sound understanding of engineering principles utilized in the systems engineering process, particularly as they relate to military systems, including establishment of system related operational requirements and criteria.

13. **Conducting and Reporting Independent Investigation**: The officer will demonstrate the ability to conduct independent investigation of 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.