

Subj: REPORT OF CURRICULUM REVIEW OF RESIDENT CURRICULUM COMPUTER SCIENCE (368)

2017-19 EDUCATIONAL SKILLS REQUIREMENTS FOR RESIDENTIAL CURRICULUM 368

Computer Science and System Design (CS)

Subspecialty: 6203

Curriculum# 368

1. Curriculum Number: 368
2. Curriculum taught by NPS.
3. Curriculum Length in Months: 24 with or without JPME
4. APC Required: 323
5. The officer must understand the fundamental concepts and be familiar with the basic functional areas of Computer Science and System Design within the Department of the Navy (DON) and the DoD including:
 - a. ESR-1: Fundamental Computer Science. Architectures, virtualization, operating systems, computer networks; high- and low-level languages and their translation, software systems, human-computer system interaction, and supporting mathematical foundations of Computer Science.
 - b. ESR-2: Software Development. Planning and development of large software projects to include specification of requirements, design, technical documentation, implementation, risk analysis, testing, quality assurance, maintenance, process metrics, and measure of effectiveness through the use of modern software engineering techniques and tools.
 - c. ESR-3: Analysis. Application of scientific method to determine reliability, efficiency and performance of computer systems; modeling, simulation, and analysis of algorithms, processes, and systems in support of military operations.
 - d. ESR-4: Data Systems and Management. Devices, interfaces and interconnects; storage architectures and data organizations, addressing and indexing; continuity, backup and recovery; resilience; models, and analytics, and visualization: large data sets, and data mining.
 - e. ESR-5: Autonomous Systems. Design, construction, and operation of autonomous systems including unmanned vehicles; analysis tools for security, forensics and intelligence. Basic skills include artificial intelligence, knowledge management and representation, machine learning, heuristic search, and data mining.
 - f. ESR-6: Cyber-Security and Cyber Operations. Development, implementation and management of security provisions, information assurance and situational awareness for computer systems, networks and control systems, and their integration with Defensive Cyber Operations, Offensive Cyber Operations, and DoD Information Network (DODIN) Operations.
 - g. ESR-7: Networking & Distributed Computing. Modeling, design and implementation of network infrastructures for distributed and mobile systems. Application of distributed multi-core and

Enclosure (6)

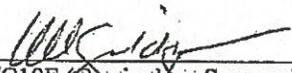
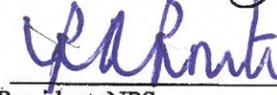
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multi-processor systems in High Performance Computing (HPC) and cloud computing configurations to support analysis, forensics, engineering, management, and other "big data" applications that apply to military operations.

h. ESR-8: Specialization. In addition to the breadth obtained from the collection of previous items, the officer will complete a series of advanced courses that integrate computer science in DoD systems, software, and operations. This in-depth study conveys essential real-world complexities and details that are required to make informed decisions during every stage of computer systems' lifecycles. Knowledge is deepened through the completion of thesis research in a framework that exercises the practices of innovation, problem solving, systems-thinking, and real-world application.

- (1) Track 1: Autonomous Systems and Data Science
- (2) Track 2: Cyber Security and Defense
- (3) Track 3: Cyber Operations
- (4) Track 4: Modeling, Virtual Environments and Simulation (MOVES)
- (5) Track 5: Network and Mobility
- (6) Track 6: Software Engineering

i. ESR-9: Joint Professional Military Education (JPME). Per community requirements, the officer will have an understanding of warfighting within the context of operational art to include: strategy and war, theater security and decision-making, and joint maritime operations. Completing the Naval War College four-course series leading to Intermediate Level Professional Military Education and JPME phase I certification fulfills this requirement.

APPROVED:	 _____ FCC/CIOF (Curriculum Sponsor)	<u>11.21.17</u> Date
APPROVED:	 _____ Major Area Sponsor	<u>12 Dec 17</u> Date
APPROVED:	 _____ President, NPS	<u>DEC 13 2017</u> Date
APPROVED:	 _____ Director, OPNAV NI2	<u>12 FEB 2018</u> Date