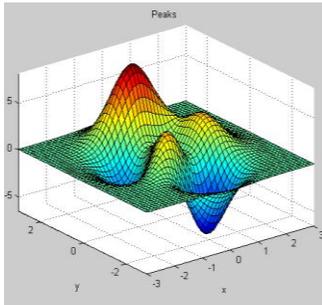


Major: Operations Research and Computer Analysis (ORCA)



Operations Research and Computer Analysis, or ORCA, “is the application of advanced analytical methods to help make better decisions.”¹ The study of Operations Research, or OR, originated during WWII. Since its inception, it has been crossing boundaries from military application into numerous fields, such as grocery store inventory and airline scheduling, in order to determine the most efficient approach to manage resources while achieving mission objectives.

As an ORCA Major you will be exposed to numerous fields of study, emphasizing “the practical application of mathematics, statistics, and computer techniques to ‘real world’ problems.”² Cadets are exposed to a breadth of courses in mathematics which provide the fundamentals to create mathematical models, simulations, and algorithms used in problem solving. ORCA majors also have the opportunity to take elective courses that delve deeper into the fundamentals of mathematical reasoning and analysis. Computer technology is a cornerstone of the ORCA major, and cadets are exposed to frontline software that is currently applied in industry. Graduates develop a strong background in computer programming, becoming proficient in numerous software packages, including Excel, Minitab, ProModel, and Mathematica.

Capstone Senior Design Projects allow students to gain real world experience during their final semester. Each student group takes on a Coast Guard operations research problem and provides solutions that will have a substantial effect on the service. Some examples of Capstone Projects are:

- Fast Response Cutter Home Port Analysis
- Analyzing U-boat detection methods during WWII to simulate and make recommendations to improve the Coast Guard’s search for self-propelled semi-submersible vessels carrying narcotics.
- Using optimization techniques to create aircraft patrol patterns for fisheries enforcement in the New England area

As a US Coast Guard Officer, you will have the ability to make a direct impact on the efficiency of your unit. Graduates have been able to immediately apply an ORCA education at their cutter, sector, or air station. One graduate was involved in developing a more efficient method for targeting fishing vessels for inspection, reducing costs and saving resources while improving the quality of the inspection service provided to the public. The Coast Guard recognizes the need for officers trained in the ORCA discipline, and continually supports graduate school opportunities for ORCA majors citing “the service need for graduates of this challenging, career-enhancing skill set with universal application to a broad spectrum of specialties has grown significantly in recent years and continues to grow.”³

¹ Informs, About Operations Research, on the Internet at <http://informs.org/About-Informs/About-Operations-Research> (visited March 27, 2012)

² U.S. Coast Guard Academy, Operations Research and Computer Analysis, on the Internet at <http://www.cga.edu/academics2.aspx?id=285> (visited March 27, 2012).

³ U.S. Coast Guard ALCOAST MSG 252/10, on the Internet at http://www.uscg.mil/announcements/alcoast/252-10_alcoast.txt (visited March 27, 2012)