THE ACADEMY EDUCATES, TRAINS AND INSPIRES MEN AND WOMEN TO BECOME OFFICERS OF CHARACTER.

OPERATIONS RESEARCH MAJOR

Suggested Course Sequence

3rd-Class Year	2nd-Class Year	1st-Class Year
Chem 200	Beh Sci 310	Academy Opt
Comp Sci 212	Biology 315	Aero Engr 315
Econ 201	Comp Sci 362	Astro Engr 310
English 211	ECE 315	Econ 465
Engr Mech 220	Econ 365	English 411
Law 220	History 300	Mgt 400
Math 243	Math 377	MSS 415/416
Math 344	Math 378	Ops Rsch 405/406
MSS 200	Ops Rsch 311	Ops Rsch 421
Physics 215	Ops Rsch 312	Ops Rsch 422
Pol Sci 211	Ops Rsch 331	Ops Rsch Opt
Sys Opt Ops Rsch 310	Philos 310	Ops Rsch Opt
		Soc Sci 412

OPERATIONS RESEARCH (Ops Rsch)

Offered by the Departments of Computer Science (DFCS), Economics and Geosciences (DFEG), Management (DFM) and Mathematical Sciences (DFMS).

Ops Rsch 310. Systems Analysis. Provides an introduction to quantitative modeling methods that have broad application. Focuses on computer implementation of models and application of these models to practical decision-making scenarios. By demonstrating the application of these techniques to problems in a wide range of disciplines, the course is relevant to technical and non-technical majors at the Academy. Covers OR tools such as optimization, queuing, simulation, and decision analysis.

Ops Rsch 311. Deterministic Models. Topics include linear programming (with sensitivity analysis and applications) and non-linear programming. Both the theory and the computer implementation of these techniques are addressed. Administered by the Department of Mathematical Sciences.

Ops Rsch 312. Probabilistic Models. Selected probabilistic models (such as random walks, Markov Chains, queues, and reliability models) are analyzed as stochastic processes. Administered by the Department of Mathematical Sciences.

Ops Rsch 331. Optimization Theory with Microeconomic Principles. Calculus-based study of optimization theory for constrained and unconstrained problems focusing on first and second order conditions, comparative statics, envelope theorem, and duality. Optimization tools are used to develop traditional microeconomic theory: consumer behavior, product and factor pricing, allocation and employment of resources, and the implications of various market structures. Course includes an introduction to game theory.

Ops Rsch 405. Operations Research Seminar I. A course for OR majors that provides for presentation of student andfaculty research, guest lectures, field trips, seminars on career and graduate school opportunities for scientific analysts in theAir Force, goal setting exercises and applications of OR.

Ops Rsch 406. Operations Research Seminar II. A course for Operations Research majors that provides for presentation of cadet and faculty research; guest lecturers; field trips; seminars on career and graduate school opportunities for scientific analysts in the Air Force; goal setting exercises; and applications of Operations Research.

Ops Rsch 417. Quick-Turn Analysis. The pace of decisions in modern warfare requires analytic results within very limited time constraints and using only commonly available tool sets. Course focuses on rapid data analysis by writing software to integrate standard office productivity software and geographical information systems to provide visibility and illumination to decision making. Specific skills and abilities taught include data manipulation and analysis, database design and usage, visualization techniques, and high impact – short duration presentation skills.

Ops Rsch 421. Capstone in Operations Research I. Study of methodologies associated with business and operations management. Project-based course intended to provide the proper foundation needed to conduct effective analyses supporting a variety of scenarios. Students evaluate various project scenarios, develop plans for and conduct analyses and create effective written and oral presentations. Develop capstone project proposal and milestones supporting Ops Rsch 422.

Ops Rsch 422. Capstone in Operations Research II. Project development and implementation for real-world clients using advanced operations research techniques with emphasis on problem recognition, model formulation and Air Force applications.

Ops Rsch 495. Special Topics. Selected advanced topics in OR.

Ops Rsch 499. Independent Study. Individual study and/or research in OR under the supervision of a faculty member.