



# Growing ORs at USNA

OMORS Education Colloquium  
March 2008

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# Current State of OR

- 161 midshipmen studying in areas related to Operations Research (Applied Mathematics and Quantitative Economics)
- 22 members of the class of 2007 earned the education code for OR
  - Includes both Navy and Marine Corps
- Three “Honors” students
- Three internships in OR fields
- Six midshipmen attending the Colloquium



# Student Projects

- Modeling an Integrated Air Defense System
- Does having a support network improve USNA graduation rates?
- Promises and Compromises: Multiobjective optimization for Kidney Paired Donation
- Mathematical Applications of Physics Principles to Swing Dance
- Lattice Point Counting with Applications to Integer Programming.



# Graduate Level

- Class of 2007
  - Masters Degree from George Mason Jan 2008
  - Working on Masters Degree from Univ of Delaware
- Class of 2008
  - Immediate Graduate Education programs reduced.
  - Opportunities limited to Bowman Scholars and External programs (Rhodes, Marshall, ...)



# OR in the Math Department

- Optimization
  - Linear Programming
  - Dynamic and Stochastic Models
- Probability
- Statistics I and II
- Search and Detection
- Simulation
- Math Modeling
- Intro to Applied Math (programming in Matlab)
- Recent additions
  - Wargaming
  - Mixed Integer Programming
  - Design of Experiments
  - Logistics



# The Future

- Actively pursuing a Major in Operations Research.
  - Supported by the Academic Dean
  - Comparable to other Service Academies
  - More non-military OR instructors
    - Currently there are 3 civilians teaching OR related courses
- Anticipated new courses
  - Spreadsheet Modeling
  - Networks
  - Math Stats



Major Matrix									
Major: SMR Operations Research									
Total Credit Hours: 138									
	4th Class year		3rd Class year		2nd Class year		1st Class year		
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	
	NS101, 2	NN101, 2	NN200, 2	NE203, 3	NS300, 1	NL310, 3		NS42X, 1	14
	CHEM1, 4	CHEM2, 4	SP211, 4	SP212, 4				NL400, 2	21
	CALC1, 4	CALC2, 4	SM223, 4		EE301, 4	EE302, 4	ES300, 3	EAVN4XY, 4	31
	HE111, 3	HE112, 3	SM239,3		ES360, 1		EM300, 4		14
	HH104, 3	FP130, 3		HH2XY, 3	HH216, 3	HM SS1, 3	HM SS2, 3	Free Elect, 3	21
		NL110, 2							3
			SM261, 3	SM233, 3	SA410, 3	SA421, 3		SA412,3	15
				SM339,3					3
				SA401, 3		MATH EL, 3	SA402, 3		9
			SA200, 3		EL1, 3	EL2, 3	EL3,3	EL4, 3	15
Semester Credit Hours	16	18	19	19	15	19	16	16	138

<b>Potential new courses:</b>	<b>SM435</b>	3-0-3	<b>Math Statistics</b>
These would be added to the	<b>SM437</b>	3-0-3	<b>Design of Experiments</b>
Track Electives when approved.	<b>SA403</b>	2-2-3	<b>Adv LP/IP</b>
	<b>SA405</b>	3-0-3	<b>Networks</b>



# Today

- OR is being taught and used at USNA
- Actively seeking new tenured track academics
- PMPs
  - Two in Monterey
- Rotational Officers
  - Short rotations due to GWOT
  - Skills underutilized in the fleet