



Space Systems Academics Overview





SSAG Background

- Interdisciplinary Academic Unit responsible for space-related curricula at NPS
 - Founded in 1983 as an Academic Committee
 - Designated in 1985 as an Academic Group
- Includes both SSAG-internal faculty and faculty from multiple NPS departments
 - Mechanical and Aerospace Engineering, Physics, Electrical Engineering, National Security Affairs, Computer Science, and Information Sciences.



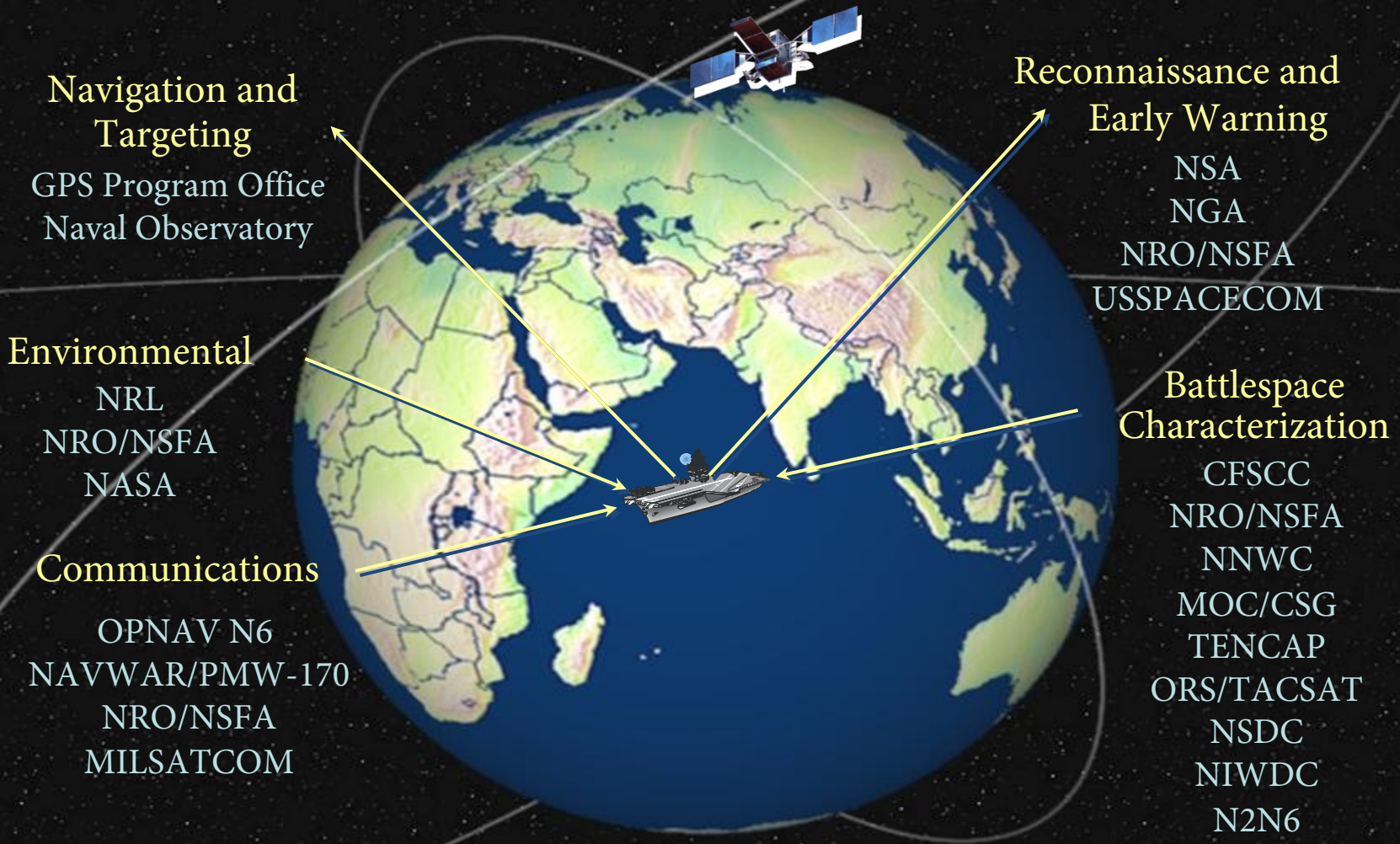


SSAG Mission

- Provide relevant and unique space-related education and research programs to enhance the security of the United States.
- Educate our students to be innovative space professionals who will lead the design, development, acquisition, and operational application of space systems.
- Drive the personal and professional development of our students, faculty, and staff.



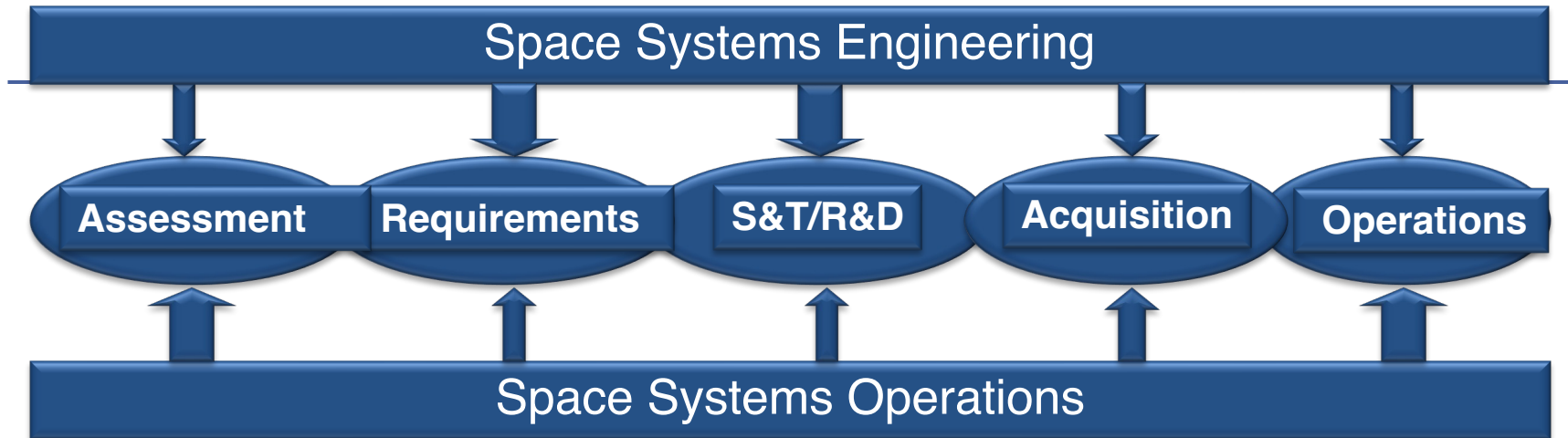
Space is Critical to the Naval Services' Global Presence



Our Advantage in Space Must be Protected and Extended



Naval Driven Curricula Focus



Two primary programs of study are offered:

Space Systems Engineering

- Systems design
- Technical requirements
- Acquisition in an operational context
- S&T/R&D
- Grants Subspecialty 5500P

Space Systems Operations

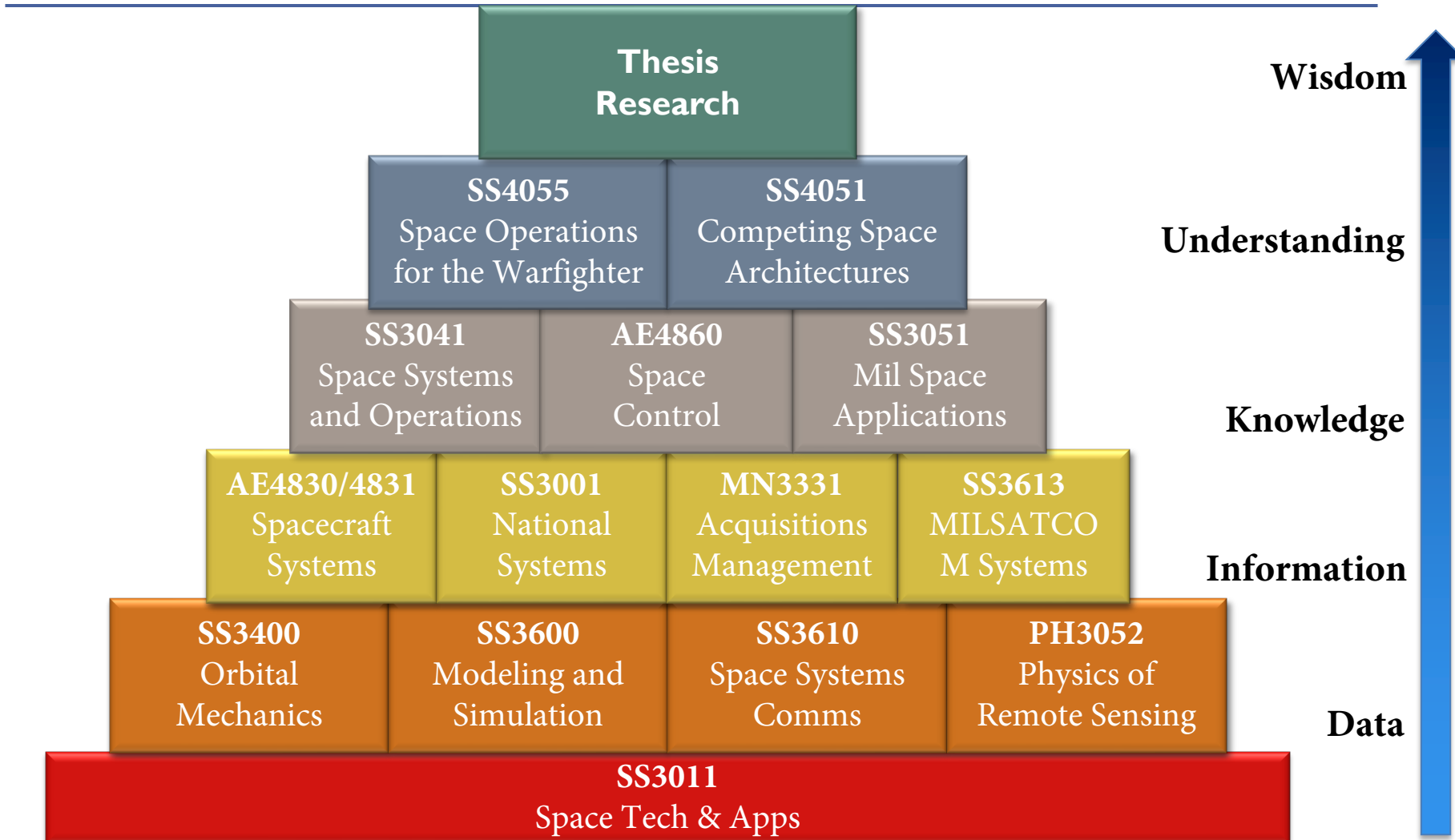
- Military systems and applications
- User requirements and operations
- Exploitation of space and information products
- Overview of S&T/R&D/Acquisition
- Grants Subspecialty 6206P

Offering Unique combination of classified course work

We are committed to personal and professional development of our students, faculty, and staff

Education, Not Training

example for Space Systems Operations





Space Systems Operations Navy 21 month + refresher

Red text indicate unique classified course work up to TS//SCI

0S	PH1121 Mechanics	MA1113 Single Var Calc	MA1114 Calc II + Matrix Algebra	NW3230 Strategy & War	
1F	SS1100 Programming for Space Applications	SS3011 Space Technologies & Applications	MN3301 (4-0) Acquisition of Defense Systems	PH1322 Electromagnetism	
2W	SS3610 Space Communications Systems	PH3052 Remote Sensing	SS3400 Orbital Mechanics, Launch and Space Operations	NS4677 Space & International Security	
3S	SS3600 Modeling & Simulation	SS3041 Space Systems & Ops 1	SS3051 Military Applications of DoD & Commercial Space Systems	SS3613 MILSATCOM Systems	SS1810 Thesis Prep
4S	AE4830 S/C Systems I	(AE4860) elective	PH2514 Space Environment	SS3001 Military Applications of Space	SS1810 Thesis Prep
5F	AE4831 S/C Systems 2	SS4051 Military Space Systems/Arch	SS0810 Thesis Research	NW3285 NSDM	
6W	SS0810 Thesis Research	SS0810 Thesis Research	Elective	NW3275 JMO Part 1	Preparatory
7S	SS4055 Space Operations for the Warfighter	SS0810 Thesis Research	IW3101 Military Ops in the Information Env.	NW3276 JMO Part 2	Required
					Elective
					JPME



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Qtr	Course	Course	Course	Course	Seminar	Course	
0 Su	MA1995 (5-1) Engineering Math I	MA1996 (5-1) Engineering Math II	PH1121 (4-2) Mechanics	PH1322 (4-2) Electromagnetism	SS4000 (0-1) Seminar		
1 F	MA2097 (4-0) Engineering Math III	SS1100 (2-2) Introduction to Programming for Space Apps	AE3840 (3-2) Introduction to Spacecraft Structures	ME2801 (3-2) Control Systems	SS4000 (0-1) Seminar		
2 W	SS3500 (4-2) Orbital Mechanics & Launch Systems	PH3052 (4-0) Remote Sensing	EO3510 (4-1) S/C Communications Engineering	AE3804 (3-0) Thermal Control of Spacecraft	SS4000 (0-1) Seminar	JPME - NW3230 (4-0) Strategy & War	
3 Sp	PH2514 (4-0) Space Environment	MN3331(5-1) Principles of Acquisition & Pgm Management	AE3818 (3-2) Spacecraft Attitude Determination & Control	Degree/Track Elective	SS4000 (0-1) Seminar	JPME - NW3285 (4-0) Theater Security Decision Making	SS1810 (0-1) Thesis Proposal Prep
4 Su	SS3861(2-4) Spacecraft Payload Design	EC3230 (3-1) Space Power	AE3851 (3-2) Spacecraft Propulsion	Degree/Track Elective	SS4000 (0-1) Seminar		
5 F	AE4870 (2-4) Spacecraft Design & Integration I	AE0810 (0-8) Thesis Research	Degree/Track Elective	Degree/Track Elective	SS4000 (0-1) Seminar	JPME - NW3275 (4-0) Joint Maritime Operations - Part 1	
6 W	AE4872 (2-4) Spacecraft Design & Integration II	SS3001 (4-1) Military Applications of Nat. Space TS//SCI	AE0810 (0-8) Thesis Research	Degree/Track Elective	SS4000 (0-1) Seminar	JPME - NW3276 (2-2) Joint Maritime Operations - Part 2	
7 Sp	SS3051 (4-0) Mil. DoD & Comm Space (S)	AE0810 (0-8) Thesis Research	AE0810 (0-8) Thesis Research	Degree/Track Elective		Legend	
						Preparatory Courses	
						591 Core	
						Track/Electives	
						JPME	



Unique Classified Course Offerings

SECRET-level Courses:

- SS3051: Military, DoD, and Commercial Space

Parts Up to TS//SCI-level:

- SS3861 Spacecraft Payload Design
- AE4870 Spacecraft Design and Integration I
- AE4872 Spacecraft Design and Integration II
- SS3041: Capabilities-based Space Systems and Operations
- AE4860: Space Control / Space Maneuvers
- SS4055: Space Operations for the Warfighter
- SS4856: Rendezvous and Proximity Operations

TS//SCI-level Full Courses:

- SS3001: Military Applications of National Space Systems
- SS4051: Competitor Space Systems
- AE4860: Space Control



Capstone Courses and Projects

Space Systems Engineering

- Satellite Design/Acquisition
- Design & Build Payloads
- High Altitude Balloons & CubeSats
- Functional Analysis & Requirement Allocation
- Classified Collection and Exploitation Systems

Space Systems Operations

- Mission/Architecture Design
- SATCOM EMI Resolution
- Imagery Architecture Analysis
- Protected SATCOM Architecture
- SATCOM Vulnerability and Mitigation Assessments
- Space Situational Awareness

Architecture Design



Certificate Programs

Resident Programs

Augment other NPS degree programs with a space graduate certificate

- Space Control Tactics and Operations

Distance Learning

Reach audiences outside of the traditional resident education setting

- Space Systems Fundamentals
- Space NC³ (Nuclear Command, Control, and Communications)