

# Class of 2016



# Academic Program

Associate Dean  
for  
Academic Affairs  
(ADAA)

Professor Frederic I. Davis  
(fid)

## A quick mathematics lesson ...

Prime integers are positive integers greater than 1 that are exactly divisible only by themselves and 1.

Examples: 2, 3, 5, 7, 11, ..., 67, ...

Integers factor uniquely into primes.

$$\text{Example: } 60 = 2 \cdot 2 \cdot 3 \cdot 5$$

As integers get larger, primes  
become more scarce ...

Here are the only prime class numbers  
that have been at the Naval Academy

1847, 1861, 1867, 1871, 1873, 1877,  
1879, 1889, 1901, 1907, 1913, 1931,  
1933, 1949, 1951, 1973, 1979, 1987,  
1993, 1997, 1999, 2003, 2011.

# More examples of prime factoring

- $2013 = 3 \cdot 11 \cdot 61$
- $2014 = 2 \cdot 19 \cdot 53$
- $2015 = 5 \cdot 403$

Here is the most important example . . .

$$2016 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 7$$

or

$$2016 = 2^5 \cdot 3^2 \cdot 7$$

This is a composite number. Perhaps, as in the case of *composite materials*, it corresponds to a Class that is strong and versatile.

# Outline of this briefing

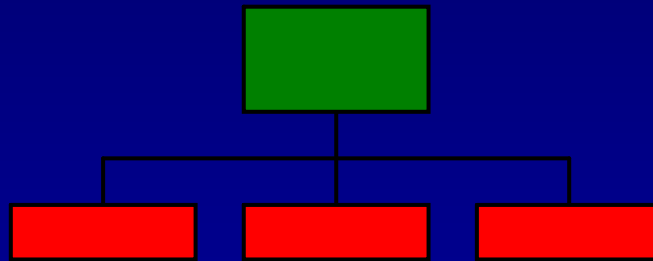
- Academic Organization
  - Chain of Command
  - Divisions and Departments
  - Majors and Minors
  - Faculty
- Graduation Requirements
  - Commission and Degree
  - Academic Requirements
  - Grades and Credits

# Outline of this briefing (cont'd)

- Academic Calendar
  - A tour from I-Day to Christmas
- Miscellany
  - Calculator
  - Computer
  - Validation
  - The academic adventure ahead
- Questions and Answers



# Academic Organization



# Superintendent

VADM Michael H. Miller, USN  
USNA, '74

## Academic Dean and Provost

Dr. Andrew T. Phillips  
Penn State U., B.S. CompSci, '84  
U. Minnesota, Ph.D., CompSci, '88

## Commandant of Midshipmen

CAPT Robert E. Clark II, USN  
USNA, B.S., GenEng, '84  
USNPS, M.S., NatlSecAffrs, '91

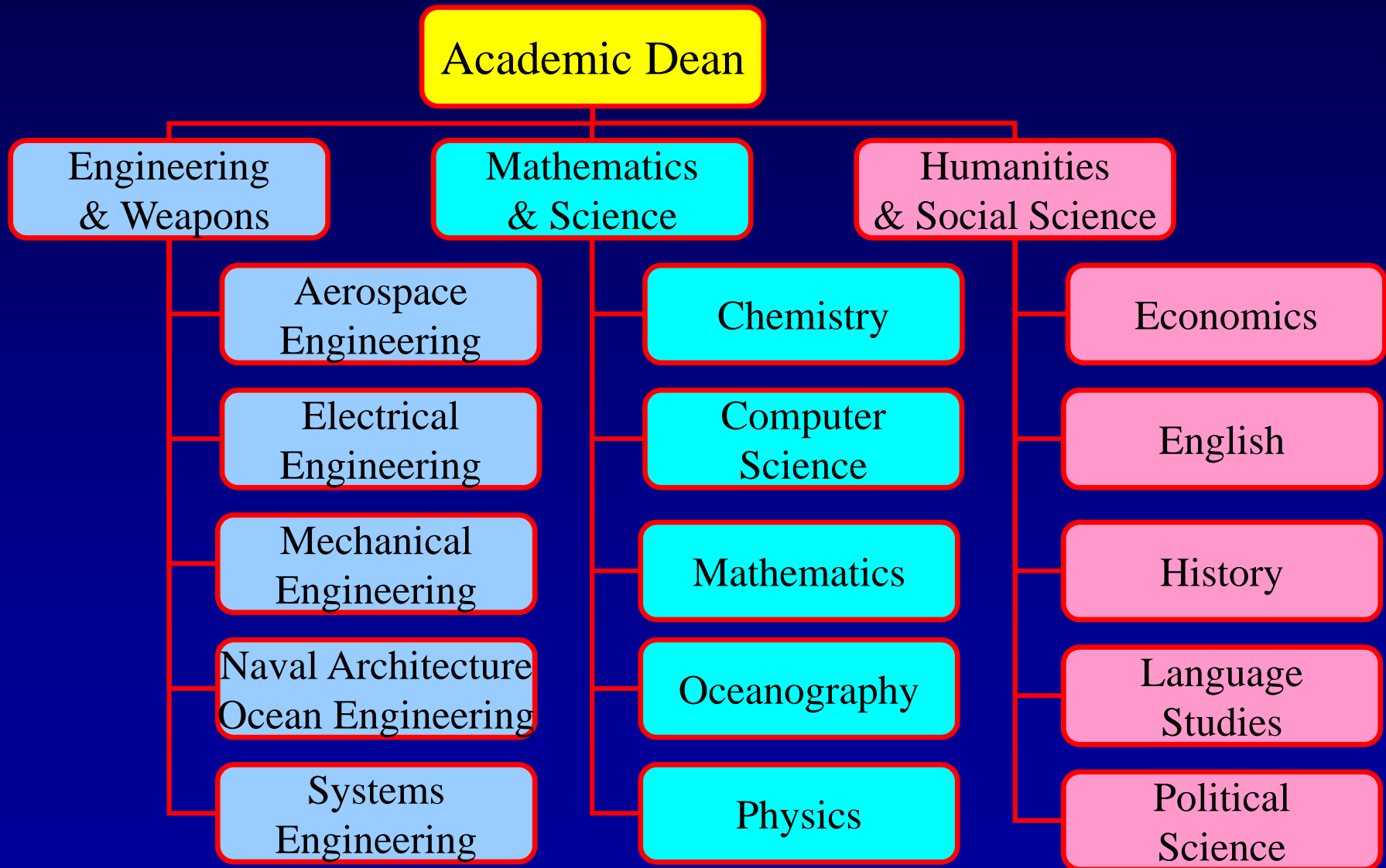
**Academic Dean  
and Provost**  
Dr. Andrew T. Phillips

**Vice Academic Dean**  
Dr. Boyd A. Waite

**Associate Dean  
Finance & Mil Affrs**  
CAPT Peter Nardi, USN  
(Ret)

**Associate Dean  
Academic Affairs**  
Dr. Frederic I. Davis

# Divisions and Departments



# Divisions and Departments

Commandant

```
graph TD; Commandant[Commandant] --> Professional[Professional Development]; Commandant --> Leadership[Leadership Education & Development]; Professional --> Seamanship[Seamanship & Navigation]; Leadership --> Ethics[Leadership, Ethics, & Law];
```

Professional  
Development

Ldrship Education  
& Development

Seamanship  
& Navigation

Leadership,  
Ethics, & Law

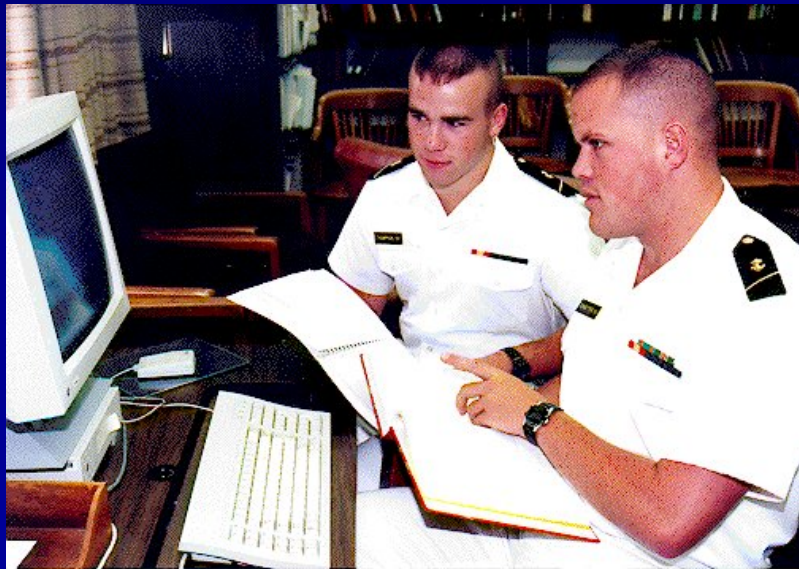
# I. Division of Engineering and Weapons



# I. Division of Engineering & Weapons

<b>Departments</b>	<b>Majors</b>
Aerospace Engineering	Aeronautical Engineering
	Astronautical Engineering
Electrical and Computer Engineering	Computer Engineering
	Electrical Engineering
Mechanical Engineering	General Engineering
	Mechanical Engineering
Naval Architecture and Ocean Engineering	Naval Architecture
	Ocean Engineering
Weapons and Systems Engineering	Systems Engineering

## II. Division of Mathematics and Science





## II. Division of Mathematics & Science

Departments	Majors
Chemistry	Chemistry
Computer Science	Computer Science
	Information Technology
Mathematics	General Science
	Mathematics, Applied Mathematics
	Operations Research
	Quantitative Economics
Oceanography	Oceanography
Physics	Physics, Astrophysics, Applied Physics

### III. Division of Humanities and Social Sciences



# III. Division of Humanities and Social Sciences

Department	Major
Economics	Economics
English	English
History	History
Political Science	Political Science
Language and Cultures	Arabic, Chinese
	Minors: Arabic, Chinese, French, German, Japanese, Russian, Spanish

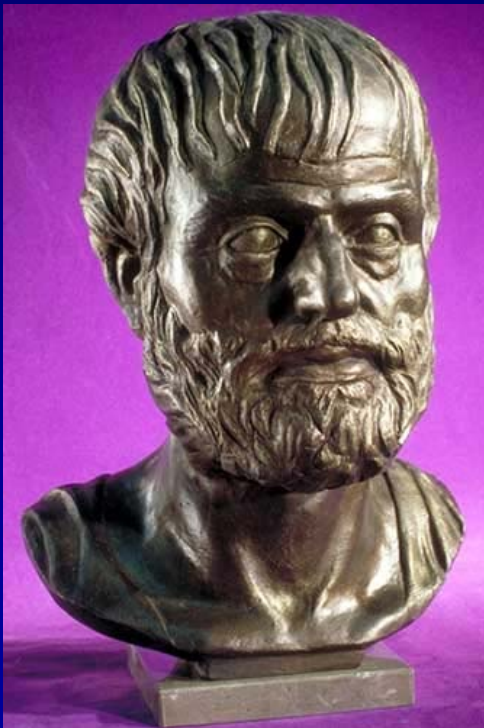
# IV. Division of Professional Development



# IV. Division of Professional Development

Department	Activities
Seamanship and Navigation	Maritime and professional skills
Professional Programs	Career information

# V. Division of Leadership Education and Development



# V. Division of Leadership Education and Development

<b>Department</b>	<b>Activities</b>
Leadership, Ethics and Law  (and Philosophy, Psychology, Sociology, Anthropology)	Leadership education and preparation for officership.

# Majors

Aeronautical Eng.	Applied Mathematics *	Arabic
Astronautical Eng.	Applied Physics	Chinese
Computer Eng.	Astrophysics	Economics *
Electrical Eng.	Chemistry	English *
General Eng.	Computer Science	History *
Mechanical Eng.	General Science	Political Science *
Naval Architecture *	Information Technology	* Honors
Ocean Eng. *	Mathematics *	
Systems Eng. *	Oceanography *	
	Operations Research	
	Physics	
	Quantitative Economics	



# Majors

- Of those USNA graduates commissioned into the US Navy, 65% shall be from majors in Science, Technology, Engineering or Mathematics (STEM).
- Needs of the Naval Service and resource constraints at the Naval Academy may constrain midshipman choices of major.

# Languages, Regional Expertise and Cultural Awareness

- It is a Department of Defense priority to increase the education and skills of the officer corps in foreign languages, regional knowledge and cultural awareness.
- The Naval Academy offers a wide array of opportunities within its regular and summer academic programs for enhancement of these skills and knowledge areas.

# Cyber Warfare

- The rapidly growing importance of cyber security to the Department of Defense and the Department of the Navy, has given rise to the introduction of two new courses in the core curriculum of the Naval Academy. The Class of 2016 is the second to which this new curriculum applies.

# Naval Academy Faculty

- Military and civilian
- Scholars and experts in their disciplines
- Connect classroom with operational experience in Fleet and Marine Corps
- Diverse
- Dedicated to the learning of midshipmen and their preparation for service

# Faculty

Since 1845: about 1/2 officer, 1/2 civilian.

Officer  
faculty:  
military role  
model,  
recent  
operational  
experience,  
masters  
degree +



Civilian  
faculty:  
academic  
expertise,  
program  
continuity,  
doctoral  
degree



# Midshipman study abroad ...



Canada, Chile, China, Colombia, Egypt, France,  
Germany, Japan, Jordan, Korea, Mexico, Morocco,  
Russia, Qatar, Senegal, Singapore, Spain, Taiwan

# Requirements





# Commission and Degree

- Academic
  - Complete core courses.
  - Complete required courses in a major.
  - Achieve an overall GPA of 2.00.
  - Complete 138 credit hours.
  - Achieve a 2.00 in major to earn *designated* degree.
- Physical education
  - Complete all PE courses and PRTs.

- Achieve standards in summer training each year.
- Achieve standards in
  - Military performance,
  - Honor, and
  - Conduct.
- Accept a commission, if offered.

meet these requirements and  
you will get to do this ...



on Friday, 27 May 2016

and you, too, may lead and serve ...



# Academic Requirements

- Core courses
  - Plebe year
  - Upper class years
- Majors program

# “Standard” plebe year

Fall	Spring
<b>Calculus I</b>	<b>Calculus II</b>
<b>Chemistry I</b>	<b>Chemistry II</b>
<b>English I</b>	<b>English II</b>
<b>Naval History</b>	<b>Government</b>
<b>Seamanship</b>	<b>Cyber Security</b>
<b>Leadership I</b>	

# Early start - “critical” language

Fall	Spring
<b>Calculus I</b>	<b>Calculus II</b>
<b>Chemistry I</b>	<b>Chemistry II</b>
<b>English I</b>	<b>English II</b>
<i>Language I</i>	<i>Language II</i>
<b>Seamanship</b>	<b>Cyber Security</b>
<b>Leadership I</b>	

# A “typical” schedule

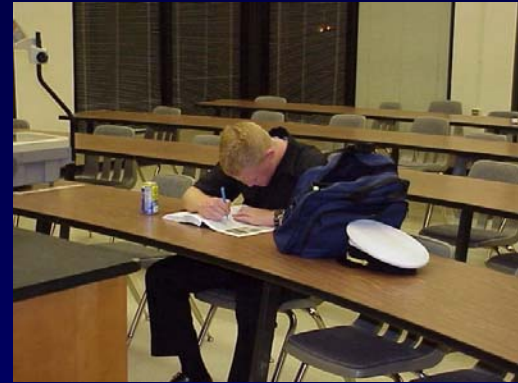




# Daily Periods

Pd	Duration	Pd	Duration
1	0755-0845	8	0755-0910
2	0855-0945		
3	0955-1045	9	0955-1110
4	1055-1145		
5	1330-1420	10	1330-1445
6	1430-1520		
7	<i>1530-1620</i>	periods: 50 or 75 min	

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>
<b>1</b>	<b>Chem I</b>		<b>Chem I</b>	<b>Chem I</b>	<b>Chem I</b>
<b>2</b>	<b>Gov't</b>	<b>PE</b>	<b>Gov't</b>	<b>Chem I</b>	<b>Gov't</b>
<b>3</b>				<b>Smnshp</b>	
<b>4</b>	<b>English</b>	<b>Smnshp</b>	<b>English</b>	<b>Smnshp</b>	<b>English</b>
<b>5</b>	<b>Ldrshp</b>		<b>Ldrshp</b>		
<b>6</b>	<b>Calc I</b>	<b>Calc I</b>	<b>Calc I</b>		<b>Calc I</b>



# Common Courses – Core (2/3)

Calculus [3]	English [2]	Leadership [2]
Mathematics-4 [1]	Gov't [1]	Ethics [1]
Cyber Warfare [2] *	History [3]	Law [1]
Chemistry [2] *	Electives [2]	Seamanship [1] *
Physics [2] *		Navigation [2] *
Electrical E [1] *	Language [4]	JO Practicum [1] *
Wpns Syst E [1] *		
Warfare E [1] *		Physical Ed [8]
Ship Propuls E [1] *	* <i>with lab</i>	

# An Engineering Major

Third Class		Second Class		First Class	
Fall	Spring	Fall	Spring	Fall	Spring
Nav I	Ethics	Nav II	Leadership	Law	JO Practic
Calculus	Diff Eqns	EE	Cyber II	Wpns	Control Sys
Physics	Physics				
W Civiliz	W Civiliz		H&SS Elec		H&SS Elec
Major	Major	Major	Major	Major	Major
	Major	Major	Major	Major	Major
		Major	Major	Major	Major
				Major	

# A Mathematics-Science Major

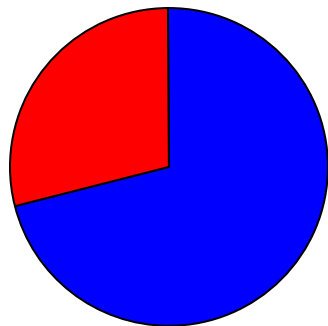
Third Class		Second Class		First Class	
Fall	Spring	Fall	Spring	Fall	Spring
Nav I	Ethics	Nav II	Leadership	Law	JO Practic
Calculus	Diff Eqns	EE	Cyber II	Wpns	Wpns Lab
Physics	Physics				Elective
W Civiliz	W Civiliz		H&SS Elec		H&SS Elec
			Ship Propul	Warfare E	
Major	Major	Major	Major	Major	Major
	Major	Major	Major	Major	Major
		Major		Major	Major

# A Humanities-Social Science Major

Third Class		Second Class		First Class	
Fall	Spring	Fall	Spring	Fall	Spring
Nav I	Ethics	Nav II	Leadership	Law	JO Practic
Calculus	Prob & Stat	EE	Cyber II	Wpns	Wpns Lab
Physics	Physics				Elective
W Civiliz	W Civiliz	H&SS Elec			H&SS Elec
			Ship Propul	Warfare E	
Language	Language	Language	Language		
Major	Major	Major	Major	Major	Major
		Major	Major	Major	Major

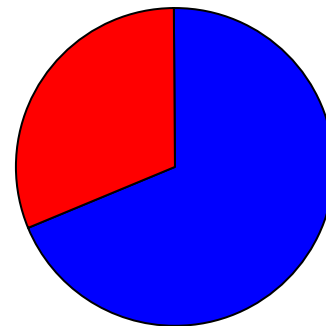
# Core and Major Courses

Courses



■ Core  
■ Major

Credits



■ Core  
■ Major



# Grades and Credits

Grade	Value or meaning
<i>A</i>	4
<i>B</i>	3
<i>C</i>	2
<i>D</i>	1
<i>F</i>	0
<i>I</i>	Incomplete
<i>V</i>	Validated

# Credits

<b>R</b>	Recitation, lecture, discussion class hours/week
<b>L</b>	Laboratory class hours/week
<b>C</b>	Credits

$$\text{Generally, } \mathbf{C} = \mathbf{R} + \mathbf{L} / 2$$

For example, Chemistry I has three recitations per week plus a single double-period laboratory while English I has three recitations per week. So, Chemistry I carries  $3 + 2/2 = 4$  credits and English I carries  $3 + 0/2 = 3$  credits.

# Plebe Course Credits

Course	R	L	C
Calculus I or II	4	0	4
Chemistry I or II	3	2	4
Cyber Security	2	2	3
English I or II	3	0	3
US Gov't and Constitution	3	0	3
Leadership I	2	0	2
Seamanship	1	2	2
Physical Education I	0	1	0

# Quality Point Ratio (QPR)

Known elsewhere as the Grade Point Average (GPA)

$$\text{QPR} = \frac{G_1 C_1 + \dots + G_N C_N}{C_1 + \dots + C_N}$$

# Academic Calendar

A plebe's eye-view from  
Induction Day to Christmas.

# Induction Day '16 – 28 June 2012



<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
			<b>Jun 28</b> Induction Day 2015	29	30
<b>Jul 02</b>	03	<b>04</b> Independence Day	05	06	07 Today
09	10	11	12	13	14
16 ACR	17 ACR	18 ACR	19 ACR	20 ACR	21
23 ACR	24	25	26	27	28
30	31	<b>Aug 01</b> AcAdviser	02 AcAdviser	03 AcAdviser	04
06	07	08	09	10 Parents Weekend	11
13	14	15	16 Brigade Reform	17 End Plebe Summer	18

<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
20 Classes begin	21	22	23	24	25
27	28	29	30	31	Sept 1 Notre Dame
03 Labor Day	04 Monday schedule	05	06	07	08
10	11	12	13	14 Prereg	15
17 Prereg	18 Prereg	19 Prereg	21 Prereg	22 Prereg	23
24 ARP	25 ARP	26 ARP	27 ARP	28 ARP	29
<b>Oct 01</b>	02 Grades	03	04	05	06 USAFA
08 Columbus Day	09	10 USN Birthday	11	12	13
15	16	17	18	19	20





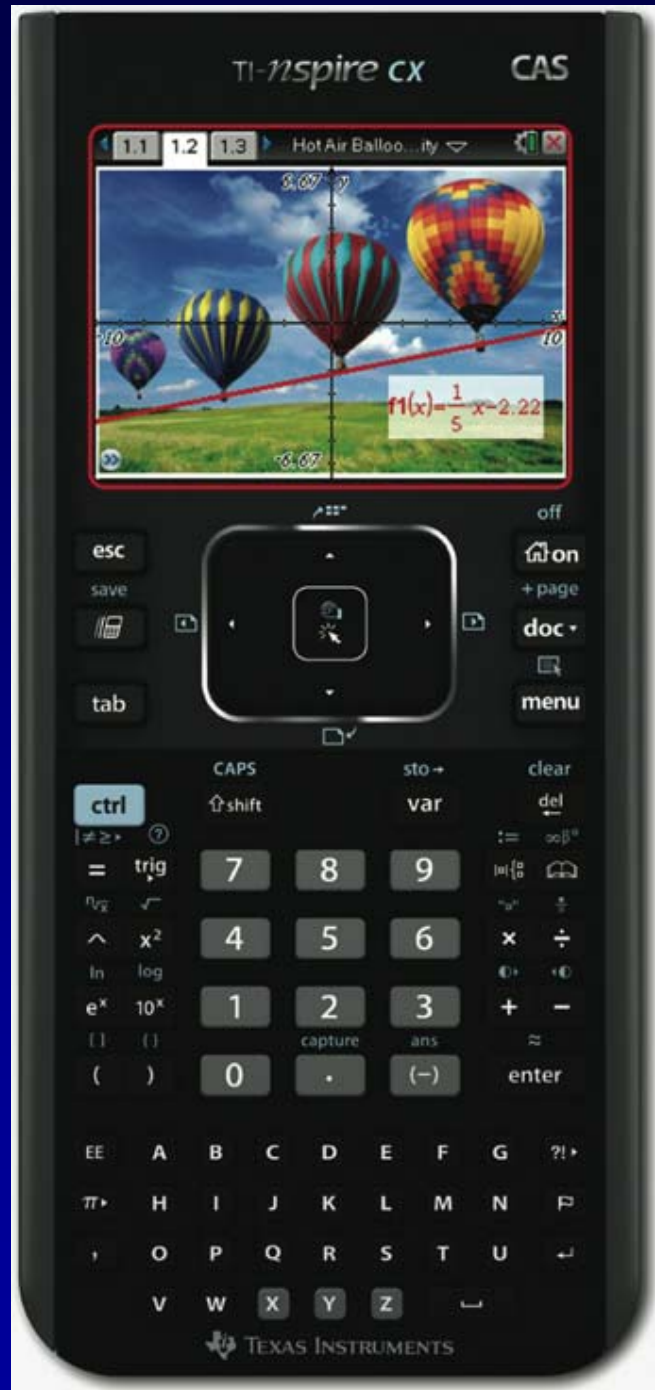
<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
22	23	24	25	26	27
29 ARP	30 ARP	31 ARP	<b>Nov 01</b> ARP	02 ARP	03
05	06 Grades	07	08	09	10 USMC Birthday
12 Veterans Day	13	14	15 Registration	16 Registration	17
19 Registration	20 Registration	Early Schedule 21 Registration	22	23 Thanksgiving	24
26 Registration	27 Registration	28 Registration	29 Registration	30 Registration	<b>Dec 01</b>
03 Registration	04 Registration	05 Registration	06 Registration	Classes end 07 Registration	08 USMA
10 Review and Study	11 Exams	12 Exams	13 Exams	14 Exams	15 Exams
17 Exams	18 Exams	19	20	21	22
24	25 Christmas Day	26	27	28	29



# Miscellaneous

Computational  
Technology

# Calculator



*TI nspire*  
CX CAS

# Computer



Lenovo Thinkpad T430 Laptop and Docking Station

# Validation

Subjects	# Validations
Engineering	5
Economics	20
Languages	1500
Political Science	120
English	130
History	40
Leadership, Ethics, Law, Psychology	60
Seamanship, Navigation	0
Biology	10
Chemistry	170
Computer Science	5
Mathematics	650
Physics	100

# The Academic Adventure Ahead

- What would you like to learn about?
  - forces that make things move
  - history of civilization
  - forms of government
  - great authors
  - how the economy works
  - military strategy and tactics
  - philosophy



- navigation by the stars
- leadership
- the composition of things
- how people think
- the environment
- robots
- computers
- religion
- logic
- decision-making
- net-centric warfare

- Chinese
- abstract algebra
- Civil War
- Islam
- principles of flight
- foreign cultures
- group behaviors
- building ships
- asteroids
- stock market
- rockets

- communications
- justification for warfare
- Russian
- artificial intelligence
- chaos
- flight
- probability and risk
- nuclear power
- terrorism
- asymmetrical warfare
- Arabic

- biometric identification
- Russian
- American Revolution
- Japanese
- General Relativity
- environmental politics
- poetry
- AIDS
- tracking near-Earth asteroids
- 
-

# What kind of educational opportunities interest you?

- original research with a faculty mentor
- attend graduate school in 1/C, finish Master's degree by December after USNA graduation
- intern at the Maryland legislature
- complete two or more majors
- achieve a minor in a language
- earn honors in a major
- spend summer cruise aboard ship of an ally

- summer internship at a Navy or Defense Department laboratory
- study in a foreign country during the summer
- spend a semester abroad
- prepare for Rhodes, Marshall, Gates, or Truman Scholarships
- develop engineering solutions to naval problems
- 
-

- All these subjects and all these educational opportunities and more are made available to you by an absolutely outstanding faculty committed to your academic success.
- Take advantage of these next four years.
- Let the adventure begin ...

# *Ex Scientia Tridens*





Questions ?