Government and Public Administration Cluster
Naval Science II: Nautical Science
Course Number 28.02400

Course Description:
The purpose of this course is to introduce the various nautical sciences through classroom work and some laboratory time. The development of core skills that students should master is integrated throughout the course and includes geography, oceanography, astronomy, physical science, meteorology, and weather. Minimum performance requirements of this course are in accordance with current Chief of Naval Education Training Instruction, NAVEDTRA 37128. The performance standards in this course are based on the performance standards identified in the curriculum for the United States Navy Junior Reserve Officer Training Corps. Successful completion of three courses of credit will qualify the student for advanced placement in a college ROTC program or accelerated promotion in the military service.

Course Standard 1

GPA-NSIINS-1
The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.
The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

Person-to-Person Etiquette	Telephone and Email Etiquette	Cell Phone and Internet Etiquette	Communicating At Work	Listening
Interacting with Your Boss	Telephone Conversations	Using Blogs	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Using Social Media	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls		Effective Written Communication	Ways We Filter What We Hear
Interacting with Suppliers	Making Cold Calls		Effective Nonverbal Skills	Developing a Listening Attitude
	Handling Conference Calls		Effective Word Use	Show You Are Listening
	Handling Unsolicited Calls		Giving and Receiving Feedback	Asking Questions
				Obtaining Feedback
				Getting Others to Listen

Nonverbal Communication	Written Communication	Speaking	Applications and Effective Résumés
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and Mixed Messages	Constructive Criticism in Writing	One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Selling Yourself in a Résumé
Nonverbal Feedback		Making Speeches	Terms to Use in a Résumé

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Showing Confidence Nonverbally		Involving the Audience	Describing Your Job Strengths
Showing Assertiveness		Answering Questions	Organizing Your Résumé
		Visual and Media Aids	Writing an Electronic Résumé
		Errors in Presentation	Dressing Up Your Résumé

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

Teamwork and Problem Solving	Meeting Etiquette
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Facilitating Discussions and Closing
	Preparing Visual Aids
	Virtual Meetings

1.3 Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.

Problem Solving	Customer Service	The Application Process	Interviewing Skills	Finding the Right Job
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Participation in Job Fairs
Managing	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	Searching the Classified Ads
	Handling Customer Complaints	When a Résumé Should be Used		Using Employment Agencies
	Strategies for Customer Service			Landing an Internship
				Staying Motivated to Search

1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

Workplace Ethics	Personal Characteristics	Employer Expectations	Business Etiquette	Communicating at Work
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	

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Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			
Leaving a Job Ethically				

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.

Expected Work Traits	Teamwork	Time Management
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
	Expressing Yourself on a Team	Staying Organized
	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior and language.

On-the-Job Etiquette	Person-to-Person Etiquette	Communication Etiquette	Presenting Yourself
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Business Meal Functions		Proper Use of Cell Phone	Using Good Posture
Behavior at Work Parties		Proper Use in Texting	Presenting Yourself to Associates
Behavior at Conventions			Accepting Criticism
International Etiquette			Demonstrating Leadership
Cross-Cultural Etiquette			
Working in a Cubicle			

Support of CTAE Foundation Course Standards and Georgia Standards of Excellence L9-10RST 1-10 and L9-10WHST 1-10:

Georgia Standards of Excellence ELA/Literacy standards have been written specifically for technical subjects and have been adopted as part of the official standards for all CTAE courses.

Leadership

Course Standard 2

GPA-NSIINS-2

Students will demonstrate an understanding of the basic principles of effective leadership.

2.1 Cite two advantages of unit leadership.
2.2 Explain the three things required for leadership positions to exist.
2.3 Explain the relationship between good followership and good leadership.
2.4 Explain that personal relationships determine a leader's overall effectiveness.
2.5 Describe at least ten essential qualities of an effective leader.

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Course Standard 3

GPA-NSIINS-3

Student will demonstrate an understanding of the importance of discipline in an organization and the different approaches to leadership.

3.1 Describe the importance of authority in the Navy.
3.2 Cite the differences between authority in civilian life and authority in the military.
3.3 Explain the importance of self-discipline in both military and civilian life.
3.4 Describe the requirements for discipline in unit drill ceremonies.
3.5 Cite the major differences between a democratic style of leadership and an autocratic style of leadership.
3.6 Cite five significant approaches to leadership.
3.7 Describe four critical skills necessary for a leader to communicate effectively.

Course Standard 4

GPA-NSIINS-4

Students will demonstrate an understanding of Maslow's Hierarchy of Needs and the importance of morale in an organization.

4.1 Describe Maslow's theory as it relates to leadership.
4.2 Describe those methods Navy leaders use to increase the motivational levels of naval personnel.
4.3 Describe those elements that contribute to good moral.
4.4 Cite eight of the general rules for building morale.
4.5 Describe three skills an effective leader uses when holding a conversation with subordinates.
4.6 Explain five important factors an effective leader must remember about leadership.

Maritime Geography of the Western and Eastern Seas

Course Standard 5

GPA-NSIINS-5

Students will demonstrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military, and geopolitics of the Western Seas.

5.1 Explain three important reasons for the study of geography.
5.2 Describe the subdivisions of the World Ocean.
5.3 Cite the importance of geography in military planning and operations.
5.4 Describe the Atlantic Ocean in terms of the economic and strategic importance to the United States and its allies.
5.5 Explain the importance of the Caribbean Sea and Gulf of Mexico to the United States.
5.6 Describe the Arctic Ocean in terms of its economic and strategic importance to the United States and its allies.
5.7 Describe the Mediterranean Sea in terms of its economic and strategic importance to the United States and its allies.

Course Standard 6

GPA-NSIINS-6

Students will demonstrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military, and geopolitics of the Eastern Seas.

6.1 Cite the importance of the Red Sea and the Gulf of Aden to American interests.
6.2 Explain the role of the United States and its allies in the Persian Gulf and the Gulf of Oman.
6.3 Describe the Indian Ocean in terms of its economic and strategic value to the United States and its allies.
6.4 Describe the value of the Pacific Ocean to the United States and its allies.
6.5 Show the special features of the Southern Ocean.

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Oceanography

Course Standard 7

GPA-NSIINS-7

Students will demonstrate an understanding of how the oceans were created and continue to transform.

7.1 Explain four reasons for the great interests now being shown in the world's oceans.
7.2 Describe those historical events that created great bodies of water.
7.3 Describe the continental drift theory.
7.4 Describe those great geological phenomena that occur today as a result of our changing Earth.

Course Standard 8

GPA-NSIINS-8

Students will demonstrate an understanding of the significance of oceanographic study as it relates to undersea landscapes.

8.1 Explain methods used to explore the ocean floor.
8.2 Describe the benefits of the continental shelf.
8.3 Discuss the makeup of the continental slope.
8.4 Derive the features of the deep ocean basin.
8.5 State the sediments found on the ocean floor.

Course Standard 9

GPA-NSIINS-9

Students will demonstrate an understanding of the significance of oceanographic study as it relates to the makeup and movement of sea water.

9.1 Describe the chemical makeup
9.2 Explain the physical properties of water.
9.3 State the composition of seawater.
9.4 Describe how water temperature is measured.
9.5 Describe environmental effects on the color of water.
9.6 Describe the causes of waves.
9.7 Describe how wave movement is measured.
9.8 Cite the causes of beach and coastline erosion.
9.9 Describe the effects of wave power.
9.10 Cite the causes of ocean currents and gyres.
9.11 Describe the current movements in the Pacific Ocean.
9.12 Explain three effects of subsurface or countercurrents.
9.13 Explain the effects of the Moon on our tides.
9.14 Describe the effects of tides on coastal areas.
9.15 Describe the theory of tidal energy.

Course Standard 10

GPA-NSIINS-10

Students will demonstrate an understanding of the significance of oceanographic study as it relates to life in the seas.

10.1 Describe how microscopic plant life is involved in the ecological system of the oceans.
10.2 Cite the chain of natural events that occur in the food cycle in the seas.
10.3 Describe life-sustaining characteristics of marine life at the edge of the sea.
10.4 Describe the abundance of life in the shallow sea.
10.5 Describe two major divisions of marine animals and their characteristics.
10.6 Discuss the laws of conservation.
10.7 Describe the effects of the open sea on man.
10.8 Cite methods used to increase stocks of commercial fish.

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10.9 Explain the marine “farming” method called aquaculture.
10.10 Describe the bioluminescence of the sea at night and its characteristics.
10.11 Describe how biological fouling and deterioration affect the Navy’s annual budget.
10.12 Describe four categories of harmful marine animals that pose a threat to man.
10.13 Describe the types of equipment used to improve man’s capability to penetrate the sea.
10.14 Describe seven major groups of pollutants and their effects on marine life.

Meteorology

Course Standard 11

GPA-NSIINS-11
Students will demonstrate a working knowledge of meteorology and how it affects us.

11.1 Investigate the aspects of the science of weather.
11.2 Express the significance of weather in history.
11.3 Describe the aspects of the Earth’s atmosphere.
11.4 Describe the meaning and characteristics of the troposphere.
11.5 Describe the meaning and characteristics of the tropopause.
11.6 Describe the meaning and characteristics of the stratosphere.
11.7 Describe the meaning and characteristics of the ionosphere.
11.8 Describe the meaning and characteristics of the exosphere and magnetosphere.
11.9 Describe the aspects of atmospheric pressure.
11.10 Describe the fundamentals in making the weather.
11.11 Describe the aspects in measuring temperature.
11.12 Describe the aspects in measuring relative humidity and dew point.

Course Standard 12

GPA-NSIINS-12
Students will demonstrate a working knowledge of meteorology as it relates to clouds and fog and how it affects us.

12.1 Describe the factors associated with cloud formation.
12.2 Draw cloud classifications as they relate to cloud types, altitudes, classes, and overall appearance.
12.3 Describe the three types of low clouds and their characteristics.
12.4 Describe the two types of middle clouds.
12.5 Describe the three types of high clouds found in our atmosphere.
12.6 Describe the factors associated when clouds are at sea.
12.7 Explain the formation of rain.
12.8 Describe modern rainmaking techniques.
12.9 Describe the cloud factors associated with the formation of snow, sleet, hail, frost, and dew.
12.10 Describe the process of how fog is formed on the Earth’s surface as well as hazards in relation to fog formation.

Course Standard 13

GPA-NSIINS-13
Students will demonstrate a working knowledge of meteorology as it relates to wind and weather and how it affects us.

13.1 Describe the characteristics of prevailing winds around the Earth.
13.2 Describe the effects of the Earth’s revolution and inclination movement on our weather patterns.
13.3 Describe the characteristics of high-pressure areas.
13.4 Describe the characteristics of low-pressure areas.
13.5 Describe the characteristics of mountain winds
13.6 Describe the characteristics of valley – wind systems.
13.7 Describe the type of monsoons in Southeast Asia.
13.8 Describe the Beaufort scale and how it is used.

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Course Standard 14

GPA-NSIINS-14

Students will demonstrate a working knowledge of meteorology as it relates to fronts and storms and how it affects us.

14.1 Describe the development of weather fronts.
14.2 Describe the primary frontal zones: Inter-tropical Convergence Zone, Arctic Frontal Zone, and Polar Frontal Zone.
14.3 Describe the characteristics of a cold front.
14.4 Describe the characteristics of a warm front.
14.5 Describe the characteristics of an occluded front.
14.6 Describe the formations, characteristics, and developmental stages of a thunderstorm.
14.7 Describe the weather phenomena within the thunderstorm.
14.8 Describe the characteristics and formation of the tornado.
14.9 Describe the characteristics and categories associated with tropical cyclones.
14.10 Describe the birth and characteristics of the hurricane.
14.11 Describe the characteristics of hurricanes, typhoons, and their tracks.
14.12 Describe the signs of an approaching tropical cyclone.
14.13 Describe the purpose and function of Storm Warning Signals.
14.14 Describe the purpose and function of the Hurricane Warning System.

Course Standard 15

GPA-NSIINS-15

Students will demonstrate a working knowledge of meteorology as it relates to weather forecasting and how it affects us.

15.1 Describe the function and structure of the National Weather Service.
15.2 Describe the function of the Navy Weather Service.
15.3 Describe the forecasting services the National Weather Service provides.
15.4 Describe the purpose of weather satellites.
15.5 Describe the service weather maps and charts provided to navigators.

Astronomy

Course Standard 16

GPA-NSIINS-16

Students will demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars, and planets.

16.1 Explain the theories of the creation of the universe.
16.2 List the methods for astronomical observation.
16.3 Describe the methods for using the telescope.
16.4 Identify the types of telescopes.
16.5 Describe examples of satellites and other exploratory spacecraft.
16.6 Explain the efforts in exploring the Solar System.
16.7 Predict important events in the field of astronomy and space exploration in the next 20 years.
16.8 Explain the discovery and development of the radio telescope.
16.9 Explain the special uses of the radio telescope and give its purpose.
16.10 Identify the methods for using balloon observatories.
16.11 Describe examples of satellites and other exploratory spacecraft.
16.12 Explain the efforts in exploring the Solar System.

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Course Standard 17

GPA-NSIINS-17

Students will demonstrate an understanding of the moon and how it pertains to our solar system and its related bodies: Sun, stars, and planets.

17.1 Recognize basic facts about the Moon such as size, distance from Earth, and atmosphere.
17.2 Describe the geological structure of the Moon.
17.3 Describe the surface features of the Moon.
17.4 Explain those theories that describe Moon craters and their formations.
17.5 Describe the mountain ranges and riles on the surface of the Moon.
17.6 Explain the effect moonquakes have on the Moon.
17.7 Describe how the Moon's motion causes its phases.
17.8 Explain the basic reasons for Moon exploration.

Course Standard 18

GPA-NSIINS-18

Students will demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars, and planets.

18.1 Explain basic facts about the Sun, and its relationship to the Earth.
18.2 Describe the composition of the Sun.
18.3 Explain sunspots and the effects they have on the Earth's atmosphere.
18.4 Explain the effects the Sun has on the Earth's magnetic field.
18.5 Describe the effects the Sun's energy has on the Earth.
18.6 Explain the importance of developing solar energy systems.
18.7 Explain the missions for further observations of the sun that has been launched in recent years.

Course Standard 19

GPA-NSIINS-19

Students will demonstrate an understanding of astronomy, and how they pertain to our solar system and its related bodies: Moon, Sun, stars, and planets.

19.1 Describe the solar system in which we live.
19.2 Identify the major characteristics of the planet Mercury.
19.3 Describe the special features of Venus as it relates to our solar system.
19.4 Describe the major features of Mars.
19.5 Identify the principal characteristics of Jupiter.
19.6 Describe the prime features of Saturn and explain how it differs from other planets in our solar system.
19.7 Describe the chief characteristics of Uranus.
19.8 Describe the relationship of Neptune and Uranus.
19.9 Identify the unique features of Pluto.
19.10 Describe the Nice Theory of Early Planetary Migration.

Asteroids, Comets, and Meteors

Course Standard 20

GPA-NSIINS-20

Students will demonstrate an understanding of asteroids, comets, and meteors and how they pertain to our solar system and its related bodies: Moon, Sun, stars, and planets.

20.1 Identify the asteroid belt as it relates to our solar system.
20.2 Describe the composition of comets and their movement.
20.3 Contrast the difference between meteoroids, meteors, and meteorites.

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Course Standard 21

GPA-NSIINS-21

Students will demonstrate an understanding astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars, and planets.

21.1 Explain the theory adopted as the common unit of astronomical distances.
21.2 Explain the system used to classify stars.
21.3 Describe the method used for determining a star's brightness.
21.4 Explain the life cycle of a star.
21.5 Explain the terms used to identify temporary stars from 134 B.C. to the present.
21.6 Describe three Nebulae stars and their makeup.
21.7 Describe the binaries and star clusters.
21.8 Determine the characteristics of our galaxy and the three ways other galaxies are classified according to their shape.

Physical Science

Course Standard 22

GPA-NSIINS-22

Students will demonstrate an understanding of Physical Science as it relates to Motion, Force, and Aerodynamics.

22.1 Describe the two main topics in the field of physical science.
22.2 List the six steps in the scientific method approach.
22.3 Describe the differences in a theory and a law.
22.4 Describe Newton's three laws of motion.
22.5 Discuss Bernoulli's theorem.
22.6 Explain how Mach numbers are derived.

Course Standard 23

GPA-NSIINS-23

Students will demonstrate an understanding of Physical Science as it relates to buoyancy.

23.1 Describe Archimedes Law.
23.2 Explain how objects float.
23.3 Explain how a submarine floats and submerges.
23.4 Explain stability in a ship and its importance.

Course Standard 24

GPA-NSIINS-24

Students will demonstrate an understanding of Physical Science as it relates to basic electricity.

24.1 Describe the fundamental theory of electricity.
24.2 Describe the properties of conductors and insulators.
24.3 Describe the six common methods of producing voltage.
24.4 Describe battery construction and significant characteristics.
24.5 Explain the principle of electrical circuits.
24.6 Describe Ohm's Law as it relates to current, voltage and resistance.
24.7 Discuss electrical power theory.

Course Standard 25

GPA-NSIINS-25

Students will demonstrate an understanding of Physical Science as it relates to electronics.

25.1 Discuss the two kinds of waves by types: Mechanical and Electromagnetic.
25.2 Discuss the four Propagation effects: Refraction, Reflection, Diffraction and Trapping.
25.3 Discuss the principles of radio-frequency wave transmission.
25.4 Describe the principals of radar.

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25.5 Describe the use of radar as a navigational aid.
25.6 Describe the use of radar in combat.

Course Standard 26

GPA-NSIINS-26
Demonstrate an understanding of Physical Science as it relates to computers and the internet.

26.1 Define the concept of a computer.
26.2 Discuss how modern computers evolved.
26.3 Explain the basics of computer architecture.
26.4 Describe the evolution of the modern internet.
26.5 Describe the attributes of a computer server.
26.6 Explain how the internet is organized, controlled, and accessed.
26.7 Explain the concepts of cyberspace and the importance of internet security.

Course Standard 27

GPA-NSIINS-27
Students will demonstrate an understanding of Physical Science as it relates to sound and sonar.

27.1 Explain the effects that density and temperature have on sound.
27.2 Explain how the ear detects sound.
27.3 Describe the Doppler shift.
27.4 Explain the characteristics of sound in seawater.
27.5 Describe sonar and its characteristics.

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