



Lombos Avenue, San Isidro, Parañaque City
www.patts.edu.ph

VISION

To become the Centre of Excellence in aviation education

MISSION

- a. To provide quality aviation education and
- b. To assist our graduates in the labor market

| BASIC STUDIES EDUCATIONAL OBJECTIVES | Mission | |
|---|---------|---|
| | a | b |
| 1. . To provide students with a good and solid foundation in mathematics, basic engineering sciences, engineering drawing, physics, general chemistry and other branches of natural sciences and to apply knowledge to aviation and other related discipline. | √ | √ |
| 2 To develop communicative skills in listening, speaking, reading, writing and graphics communication pertaining to technical drawing interpretation. | √ | √ |
| 3. To teach and train students the importance of humanistic values and respect of cultural differences through humanities and social sciences. | √ | √ |
| 4. To impart high ethical standards to the students through assimilation and incorporation in the learning activities. | √ | √ |
| 5. To infuse students with enhanced computer concepts and expertise through incorporating competent applications and disciplines. | √ | √ |
| 6. . To acquire the total human development according to its physical, mental, emotional, social aspects in promoting a healthy lifestyle. | √ | √ |

COURSE SYLLABUS

1. **Course Code:** NSCI 221
2. **Course Title:**College Physics 2Lecture
3. **Pre-requisite/s:** General Chemistry, College Algebra, Trigonometry, Physics 1
4. **Co-requisites:**NSCI 221L
5. **Credit:** 3 units: 3 units lecture

| | | | | | |
|--|--|--|---|--|------------------------|
| Course Title: College Physics 2 | Date Effective: A.Y.2012-2013 | Prepared by: Editha E. Domingo Carlos Seguido Isaac Enriquez Mary Grace Facundo | Reviewed by: Engr.Editha E. Domingo | Approved by: Engr. Lorenzo L. naval, Jr. VP for Academic Affairs | Page 1of 7 |
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6. Course Description: This is a continuation of Physics One. It included the following topics: Properties of matter, heat and temperature, pressure, gas laws, magnetism, electromagnetism, resistance, electricity, direct current and alternating current motor, direct current and alternating current generators, capacitance, light and sound.

7. Program Outcomes and Relationship to Basic Studies Educational Objectives

| PROGRAM OUTCOMES | Basic Studies Educational Objectives | | | | | |
|---|--------------------------------------|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| a. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of better aviation and aviation related program. | √ | √ | | √ | | √ |
| b. An ability to design and conduct experiments to test hypotheses and verify assumptions, as well as to analyse and interpret data and to simulate processes. | | √ | | √ | √ | √ |
| c. An ability to design, improve, innovate, and to supervise systems or processes to meet desired needs within realistic constraints. | | | √ | √ | | √ |
| d. An ability to work effectively in multi-disciplinary and multi-cultural teams in diverse fields of practice. | | √ | √ | √ | | √ |
| e. An ability to identify, formulate, and solve aviation and aviation related program. | √ | | | | | √ |
| f. An understanding of the effects and impact of the aviation and aviation related program profession on the environment and the society, as well as the social and ethical responsibilities of the profession. | √ | | √ | √ | | √ |
| g. Specialized knowledge in at least one field of aviation and aviation related program practice, and the ability to apply such knowledge to provide solutions to actual problems. | √ | | | | | √ |
| h. An ability for effective oral and written communications particularly in the English language. | | √ | | | | √ |
| i. An ability to engage in life-long learning and to keep current of the development in a specific field of specialization. | | | √ | √ | | √ |
| j. An ability to use the appropriate techniques, skills and tools necessary for the practice of aviation and aviation related program. | √ | √ | | √ | √ | √ |
| k. A knowledge of contemporary issues. | √ | | √ | √ | | √ |
| l. An ability to apply acquired aviation and aviation related program aviation and aviation related program.knowledge and skills for national development. | √ | | √ | √ | | √ |

8. Course Objectives and Relationship to Program Outcomes:

| Course Objectives The students should be able: | PROGRAM OUTCOMES | | | | | | | | | | | |
|---|------------------|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k | l |
| 1. To explain the importance of the study of the concepts of elasticity, pressure, heat, electricity and magnetism in relation with aviation related program. | √ | √ | √ | | √ | | √ | √ | | √ | | √ |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. To enhance scientific and conceptual ideas and mathematical skills for independent critical thinking necessary to solve Physics related problems | √ | √ | √ | | √ | | √ | | √ | | √ | √ | √ |
| 3.To provide complete understanding of the concepts of mechanical and electromagnetic waves such as sound and light waves and link its applications to aircraft industry. | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

9.Course Coverage

| WEEK | TOPIC/ACTIVITY | METHODOLOGY AND STRATEGY | ASSESSMENT TOOLS |
|------|--|---|---|
| 1 | Orientation and Introduction to the Course PATTS Vision and Mission Course Objectives, Policies, Guidelines, Nature and Scope of the course Physics in Aviation | Peer discussion on Vision Mission and Course Objectives, Policies, Guidelines, Nature and Scope Physics in Aviation | |
| | Elastic Properties of Solids and Liquids Hooke's Law Stress Strain | Lecture and Discussion | Seat work |
| 2 | Elastic Moduli Young's Modulus Bulk Modulus Shear Modulus Poisson's Ratio | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork |
| | Quiz No. 1 | | Quiz Discussion |
| 3 | Vibration Motion Simple Harmonic Motion Acceleration Speed and SHM Period and Frequency in SHM Energy in Simple Harmonic Motion | Lecture and Discussion | Seatwork |
| 4 | Simple Pendulum Compound Pendulum Simple Angular Harmonic Motion Resonance | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Homework Problem Set |
| | Quiz No. 2 | | Quiz Discussion |

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| 5 | Temperature; Thermal Expansion of Solids, Liquids and Gasses Linear and Volume Expansion | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Homework |
| 6 | Heat Phenomena Specific Heat/ Sensible Heat Latent Heat of Fusion Latent Heat of Vaporization Change of Phase Method of Mixture | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Homework |
| FIRST PERIODICAL EXAM | | | |
| 7 | Heat Transfer Conduction Convection Radiation | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Homework Problem Set |
| | Quiz No. 1 | | Quiz Discussion |
| 8 | Fluid Mechanics Pressure Produced by a Fluid Pascal's Law Bernoulli's Principle Buoyancy; Archimedes Principle | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Homework |
| 9 | Wave Motion Transverse Waves Longitudinal Waves Transmission of Energy Superposition of Waves Refraction and Dispersion | Lecture and Discussion | Seatwork |
| 10 | Periodic Waves Stationary Waves Modes and Vibration Reflection of Waves | Lecture and Discussion Cooperative Learning Class Interaction | Seat work Home work |
| | Quiz No. 2 | | Quiz Discussion |
| 11 | Sound Sound Intensity Speed of Sound Doppler Effect Interference Effect; Beats Refraction of Sound Refraction of Sound Waves Sonic Booms Ultrasonic vs. Supersonic | Lecture and Discussion Cooperative Learning Class Interaction | Problem Set Seat work Home work |
| | Quiz No. 3 | | Quiz Discussion |

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| 12 | Light Natural Light Characteristics of Light Snell's Law Quantum Theory Luminous Intensity of a Point of Source Illuminance Refraction of Light | Lecture and Discussion Cooperative Learning Class Interaction | |
| | SECOND PERIODICAL EXAM | | |
| 13 | Electricity Type of Electricity Production of Electricity | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork |
| 14 | Direct Current Electricity Direct Current Circuits Alternating Current Electricity Production and User of Alternating Current Electricity | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork |
| | Quiz No. 1 | | Quiz Discussion |
| 15 | Electric Circuit Components Conductors Resistors Capacitors Inductors Transformers Rectifiers | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Home work |
| 16 | Magnetism Permanent Magnets Electromagnets | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Home work |
| | Quiz No. 2 | | Quiz Discussion |
| 17 | Electrical Motor Electrical Generators | Lecture and Discussion Cooperative Learning Class Interaction | Seatwork Oral and Written Report |
| 18 | THIRD PERIODICAL EXAMINATION | | |

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10. Course Outcomes and Relationship to Course Objectives / Program Outcomes

| Course Outcomes | Course objectives | | | Program Outcomes | | | | | | | | | | | | |
|--|-------------------|---|---|------------------|---|---|---|---|---|---|---|---|---|---|---|--|
| | 1 | 2 | 3 | a | b | c | d | e | f | g | h | I | j | k | l | |
| A Student completing this course should be at the minimum be able to: | | | | | | | | | | | | | | | | |
| 1. Explain the relationship between the stress applied to the resulting deformation | √ | √ | √ | √ | √ | | | | | √ | √ | | | | | |
| 2. Analyze situations in which a body is deformed by tension, compression, pressure or shear | √ | √ | √ | √ | | | | | | √ | | | √ | | | |
| 3. Describe oscillations in terms of amplitude, period, frequency and angular frequency | √ | √ | | √ | | | | | | | | | | | | |
| 4. Analyze motions of physical and simple pendulum | √ | √ | √ | √ | √ | | | | | √ | | | √ | | | |
| 5. Explain how the dimension of an object change as the result of temperature change | √ | √ | √ | √ | | | | | | √ | √ | | | | | |
| 6. Solve problem involving calorimetry, phase change and heat flow | √ | √ | | √ | √ | | | √ | | √ | | | √ | | | |
| 7. Site applications of Pascal's Law Archimedes Principle and Bernuolli's Principle | √ | √ | √ | √ | | | | | √ | √ | | | √ | √ | √ | |
| 8. Relate speed, frequency and wavelength of a periodic wave | √ | √ | | √ | | | | | | | | | | | | |
| 9. Interpret and use the mathematical expression for sinusoidal periodic wave | √ | √ | | √ | | | | | | √ | | | √ | | | |
| 10. Describe sound wave in terms of either particle displacements or pressure fluctuations | √ | √ | | √ | | | | | | | √ | | | | | |
| 11. Solve problems involving speed and intensity of sound waves and Doppler effect. | √ | √ | √ | √ | | | | √ | | √ | | | √ | | | |
| 12. Describe the nature and propagation of light | √ | √ | | √ | | | | | | | √ | | | | | |
| 13. Use Coulomb's Law to calculate the electric force between charges | √ | √ | | √ | | | | √ | | √ | | | √ | | | |
| 14. Differentiate direct current and alternating current | √ | √ | | √ | | √ | | | | | | | | | | |

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|---|---|---|--|---|--|---|--|---|--|---|--|--|---|---|
| 15. Apply Ohm's Law to calculate for the voltage, resistance and current in electric circuits | √ | √ | | √ | | √ | | √ | | √ | | | √ | |
| 16. Analyze magnetic forces on current carrying conductors | √ | √ | | √ | | √ | | | | √ | | | | √ |

11. Contribution to Course to Meeting the Professional Component:

General Education: 5%
 Basic Sciences and Mathematics: 95%

12. References:

- a. Giancoli, Physics, 6th Edition (2007), Pearson
- b. Young, Hugh, Freedman, Roger and Ford, Lewis, University Physics, 12th Edition (2007)
- c. Cutnell and Johnson, Physics, 8th edition (2010)

13. Website

- a. www.physicscalsroom.com
- b. www.malcolmgin.com/blog/2008/10/07/caltech-the-mechanical-universe-series-on-google-video/

14. Course Evaluation

The Final Course Grade = $\frac{\text{Prelim Grade} + \text{Midterm Grade} + \text{Final Grade}}{3}$

The Periodical Grade is computed as follows:

Classwork 60%
 Periodical Exam 40%

Total 100%

The Classwork is computed as follows:

Homeworks, Seatworks, recitations, Problem Set 40%
 Quizzes 60%
 Total 100%

Grading Scale:

| Final Average | Grade | Final Average | Grade |
|---------------|-------|---------------|-------|
| Below 70 | 5.0 | 84-86 | 2.0 |
| 70-73 | 3.0 | 87-90 | 1.75 |
| 74- 76 | 2.75 | 91-93 | 1.5 |
| 77- 80 | 2.5 | 94-97 | 1.25 |
| 81-83 | 2.25 | 98-100 | 1.0 |

15. Committee Members:

- Engr. Editha Domingo-Head
- Mr. Carlos Seguido
- Mr. Isaac Enriquez
- Ms. Mary Grace Facundo

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- a. To provide quality and affordable aviation education and
- b. To help our graduates in the labor market

| BASIC STUDIES EDUCATIONAL OBJECTIVES | Mission | |
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| | a | b |
| 1. . To provide students with a good and solid foundation in mathematics, basic engineering sciences, engineering drawing, physics, general chemistry and other branches of natural sciences and to apply knowledge to aviation and other related discipline. | √ | √ |
| 2 To develop communicative skills in listening, speaking, reading, writing and graphics communication pertaining to technical drawing interpretation. | √ | √ |
| 3. To teach and train students the importance of humanistic values and respect of cultural differences through humanities and social sciences. | √ | √ |
| 4. To impart high ethical standards to the students through assimilation and incorporation in the learning activities. | √ | √ |
| 5. To infuse students with enhanced computer concepts and expertise through incorporating competent applications and disciplines. | √ | √ |
| 6. . To acquire the total human development according to its physical, mental, emotional, social aspects in promoting a healthy lifestyle. | √ | √ |

COURSE SYLLABUS

- 1. **Course Code** : NSCI 111Lab
- 2. **Course Title** : General Chemistry 1(Laboratory)
- 3. **Pre-Requisite** : None
- 4. **Co-Requisite** : None

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5. **Credit/Class Schedule** : combined with lecture/ 3 hours per week
6. **Course Description** : A laboratory course to accompany NSCI 111. This covers experiments and exercises designed to enrich students' understanding of the topics discussed in the lecture.

7. Program Outcomes and Relationship to Basic Studies Educational Objectives

| PROGRAM OUTCOMES | Basic Studies Educational Objectives | | | | | |
|--|--------------------------------------|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| a. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of aeronautical engineering. | √ | √ | | √ | √ | |
| b. An ability to design and conduct experiments to test hypotheses and verify assumptions, as well as to analyse and interpret data and to simulate processes. | √ | √ | | √ | √ | √ |
| c. An ability to design, improve, innovate, and to supervise systems or processes to meet desired needs within realistic constraints. | √ | √ | | √ | | √ |
| d. An ability to work effectively in multi-disciplinary and multi-cultural teams in diverse fields of practice. | √ | √ | √ | √ | √ | √ |
| e. An ability to identify, formulate, and solve aeronautical engineering problems. | √ | √ | | √ | √ | √ |
| f. An understanding of the effects and impact of the aeronautical engineering profession on the environment and the society, as well as the social and ethical responsibilities of the profession. | | √ | √ | √ | | √ |
| g. Specialized knowledge in at least one field of aeronautical engineering practice, and the ability to apply such knowledge to provide solutions to actual problems. | √ | √ | | √ | √ | |
| h. An ability for effective oral and written communications particularly in the English language. | √ | √ | √ | √ | | √ |
| i. An ability to engage in life-long learning and to keep current of the development in a specific field of specialization. | √ | √ | | √ | √ | √ |
| j. An ability to use the appropriate techniques, skills and tools necessary for the practice of aeronautical engineering. | √ | √ | √ | √ | √ | |
| k. A knowledge of contemporary issues. | √ | √ | √ | √ | | √ |
| l. An ability to apply acquired aeronautical engineering knowledge and skills for national development. | √ | √ | √ | √ | √ | √ |

8. Course Objectives and Relationship to Program Outcomes:

| | | | | | |
|--|---|--|---|--|-------------------------|
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| Course Objectives The students should be able: | PROGRAM OUTCOMES | | | | | | | | | | | |
|--|------------------|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k | l |
| 1. To carry out common laboratory techniques and operations. | √ | | | | √ | | | √ | √ | √ | | |
| 2. To accustom oneself with the physical and chemical properties of matter. | √ | √ | √ | | √ | √ | | √ | √ | √ | √ | |
| 3. To evaluate analytically and objectively through careful analysis using the results of experimentation. | | √ | | √ | | √ | | √ | √ | √ | | |

9. Course Coverage:

| WEEK | TOPIC | METHODOLOGY | ASSESSMENT |
|------|--|--|----------------------------------|
| 1 | Orientation Common Laboratory Apparatus | Discussion | Graded exercise |
| 2 | Experiment 1: Basic Laboratory Techniques | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 3 | Experiment 2: Measurement | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report Homework |
| 4 | Exercise 1: Significant Figures | Discussion, Problem solving | Homework |
| 5 | PRELIM EXAM | | |
| 6 | Experiment 3: Changes of Matter | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 7 | Experiment 4: Classes of Matter | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 8 | Experiment 5: Flame Spectra | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 9 | Exercise 2: Periodic Law | Discussion, Illustration | Homework |
| 10 | MIDTERM EXAM | | |
| 11 | Experiment 6: Chemical Periodicity | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 12 | Exercise 3: Naming of Compounds | Discussion | Seatwork |
| 13 | Experiment 7: Stoichiometry | Pre lab Discussion Laboratory Experiment Post lab Discussion | Written Final Report |
| 14 | Exercise 4: Mole Concept | Discussion, Problem | Homework |

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| | | solving | |
| 15 | Exercise 5: Stoichiometry problems | Discussion, solving | Problem Seatwork |
| 16 | FINAL EXAM | | |

10. Course Outcomes and Relationship to Course Objectives / Program Outcomes

| Course Outcomes | Course objectives | | | Program Outcomes | | | | | | | | | | | |
|---|-------------------|---|---|------------------|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | a | b | c | d | e | f | g | h | I | j | k | l |
| A Student completing this course should be at the minimum be able to: | | | | | | | | | | | | | | | |
| 1. carry out basic laboratory techniques and operations. | √ | √ | √ | √ | √ | √ | | √ | | √ | | √ | | | |
| 2. acquire an understanding of the importance of measurements in Chemistry. | √ | √ | √ | √ | √ | √ | | √ | | √ | | √ | | | |
| 3. distinguish chemical change from physical change. | √ | √ | √ | √ | √ | √ | | √ | | √ | | √ | | | |
| 4. classify matter as element, compound, or mixture. | √ | √ | | √ | √ | √ | | | | | | √ | | | |
| 5. identify elements through flame spectra. | √ | √ | | √ | √ | √ | | | | | | √ | | | |
| 6. relate the periodic table to chemical periodicity | √ | √ | | √ | √ | √ | | | | | | √ | | | |
| 7. Write chemical formulas and name chemical compounds | √ | √ | | √ | √ | √ | | | | | | √ | | | |
| 8. determine the mass relationship in chemical reactions. | √ | √ | | √ | √ | √ | | | | | | √ | | | |

11. Contribution to Course to Meeting the Professional Component:

General Education: 5%
Basic Sciences and Mathematics: 95%

13. References:

- Samonte, Figueroa, General Chemistry Laboratory Manual, 3rd ed
- De Borja, Laboratory Manual in Chemistry
- The Committee on General Chemistry, Laboratory Manual and Workbook for General Chemistry

14. Course Evaluation

$$\text{The Final Course Grade} = \frac{\text{Prelim Grade} + \text{Midterm Grade} + \text{Final Grade}}{3}$$

The Periodical Grade is computed as follows:

Exercises 20%
Experiments(Reports) 40%
Periodical Exam 40%

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Total 100%

Grading Scale:

| Final Average | Grade | Final Average | Grade |
|---------------|-------|---------------|-------|
| Below 70 | 5.0 | 84-86 | 2.0 |
| 70-73 | 3.0 | 87-90 | 1.75 |
| 74- 76 | 2.75 | 91-93 | 1.5 |
| 77- 80 | 2.5 | 94-97 | 1.25 |
| 81-83 | 2.25 | 98-100 | 1.0 |

15. Laboratory Safety Guidelines:

- a. Eating, drinking, and smoking are strictly prohibited inside the Laboratory.
- b. Working areas should be kept clean and orderly.
- c. Procedures should be read , discussed and understood thoroughly before performing the experiments.
- d. Any kind of accident should be reported at once to the Laboratory Instructor.
- e. All data and observations obtained from the experiment should be recorded honestly.
- f. Only experiments approved by the Instructor must be performed.
- g. No chemicals and equipment must be taken outside the laboratory.
- h. Flammable liquids must be kept away from burners and gas inlets.
- i. Corrosive substances , spilled on the skin, must be washed off promptly with plenty of water.
Clothes spilled with chemicals must be removed immediately.
- j. Never flush your liquid wastes down the sinks, instead, dispose them in designated waste bins.
- k. Clean up working tables before leaving the laboratory. Make sure that all gas valves and faucets are firmly closed.

16. Committee Members:

Engr. Editha Domingo-Head
Mr. Albert Soriano
Ms. Heide Sanchez
Mr. Ferdinand Paguirigan

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