

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: APPLIED PHYSICS II

CODE NO, : PHY 118-3 SEMESTER;

PROGRAM WATER RESOURCES/ENVIRONMENTAL/PULP & PAPER
ENGINEERING TECH

AUTHOR SUBHASH VERMA P.ENG

DATE MAR. 9 4 PREVIOUS OUTLINE DATED: JAN 93

APPROVED: DEAN, SCHOOL OF SCIENCES &
NATURAL RESOURCES

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TOTAL CREDIT HOURS: 48

PREREQUISITE(S): PHY 100 OR EQUIVALENT

I. PHILOSOPHY/GOALS:

This course is a continuation of **PHY 100** with the aim to provide the student with the knowledge of the basic principles of Physics which are applied in other courses of the technology program. The material is taught mainly by using practical examples and problem solving skills are emphasized.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will be able to:

1. Have an understanding of pressure, fluid flow, the gas laws, thermodynamics.
2. Analyze simple electric circuits and wave motion and solve questions related to above topics,
3. Will have the mathematical skills to manipulate formulae and convert units with proper dimensional analysis.
4. Apply the knowledge of fluid flow, heat transfer and electricity to solve problems in the various areas of technology.

III. TOPICS TO BE COVERED:

**Approximate Time Frames
(Optional)**

- | | |
|---|---------|
| 1. Properties of Solids | 1 week |
| 2. Pressure and Fluids | 3 weeks |
| 3. Temperature and Expansion | 2 weeks |
| 4. Quantity of Heat and Heat Transfer | 2 weeks |
| 5. Gas Laws and Thermodynamics | 2 weeks |
| 6. Electrostatics | 1 week |
| 7. Direct Electric Current | 2 weeks |
| 8. Magnetism and Electrical Instruments | 1 week |
| 9. Induced and Alternating Currents | 1 week |
| 10. Wave Motion, Sound and Light | 1 week |

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IV, LEARNING ACTIVITIES**REQUIRED RESOURCES****1. Properties of Solids**

Elasticity, Hook's Law
 Stress Strain Diagram
 Young's Modules
 Elastic Limit, Ultimate
 Strength

Chapter 11

Exercise 11 - 1 to 10
 Worksheet on Elasticity

Fluids

Mass and Weight Density
 Specific Gravity
 Pressure, Measuring Pressure
 Hydraulic Press,
 Buoyancy
 Pressure and Elevation
 Fluids in Motion
 Continuity Equation
 Bernoulli's Equation

Chapter 12

Exercise 12 - 1 to 4
 Worksheet on Density
 Exercise 12 - 5 to 10
 Exercise 12 - 11 to 15
 Worksheet on Hydraulic Press
 Exercise 12 - 16 to 23
 Exercise 12 - 12 to 28
 Worksheet on Flows

Temperature and Expansion

Temperature and Thermal
 Energy
 Temperature Scales
 Linear, Area and Volume
 Expansion

Chapter 13

Exercise 13 - I to 10
 Exercise 13 - II to 26

**Quantity of Heat and Heat
 Transfer**

Quantity of Heat
 Specific Heat Capacity
 Change of Phase
 Thermal Equilibrium
 Heat of Combustion
 Heat Transfer

Chapter 14

Exercise 14 - 1 to 12

 Exercise 14 - 13 to 23

Worksheet on specific heat and
 change of phase.

5, Gas Laws and Thermodynamics

Gas Laws
 General Gas Law
 First Law of Thermodynamics
 Heat and Work Equivalence
 Second Law of Thermodynamics
 The Ideal Engine
 Internal Combustion Engine
 Refrigeration

Chapter 15

Exercises 15 - 1 to 12
 Worksheet on general Gas Law
 Exercise 15 - 13 to 23

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IV. LEARNING ACTIVITIES

REQUIRED RESOURCESElectrostatics

Electric Charge and Electron
 Insulators and Conductors
 Coulomb's Law
 Electrical Field
 Potential Energy-
 Capacitors
 Safety Concerns

Chapter 16

Question 16 - 1 to 10
 Problem 16 - 1 to 10

Direct Electric Current

Electric Current
 Electromotive Force
 Ohm's Law
 Electric Power
 Series and Parallel Circuits
 Internal Resistance of

Chapter 17

Exercise 17 - 1 to 30
 Worksheets on circuits.

8. Magnetism and Electric
 Instrximents

Batteries
 Magnetic Fields
 Magnetic Field and
 Electrical Current
 Galvanometer
 DC Ammeter and Voltmeter
 DC-Motor

Chapter 18

Selected exercises and problems
 set.

10. Wave Motion and Sound and Light

Types of Waves
 Wavelength, Frequency
 Sound
 Resonance
 Electromagnetic Spectrum
 Light Intensity

Chapter 20

Question 20 - 1 to 10

Chapter 21

Question 21 selected exercises

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V. EVALUATION METHODS:

Final grade is based on the total score. Distribution is as follows:

Quizz Tests (unannounced)	= 20%
Mid-term test	= 30%
End-term test	= 50%

A+ = 90 - 100%

B = 70 - 79%

A = 80 - 89%

C = 60 - 69%

Students who have achieved less than 60% but more than 55% on all of the tests have the opportunity to write a supplemental test covering all of the course material. This is only granted where all of the tests have been written and attendance is satisfactory..

VI. REQUIRED STUDENT RESOURCES:

Tippens, P.E. Basic Technical Physics, 2nd Edition, McGraw-Hill.

II. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

Other College Physics Textbooks from the Library.

VIII, SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

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