

DOC. #26

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: APPLIED PHYSICS II

CODE NO.: PHY118-3

SEMESTER: II

PROGRAM: WATER RESOURCES/ENVIRONMENTAL/PULP & PAPER
ENGINEERING TECHNICIAN

AUTHOR: BRAD KIRK

DATE: JANUARY 1995

PREVIOUS OUTLINE DATED: MARCH 1994

APPROVED:

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DATE

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TOTAL CREDITS 4£

PREREQUISITE(S): PHY100 OR EQUIVALENT

L PHILOSOPHY/GOALS:

This course is a continuation of PHY100 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.

M. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

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. 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:

1. Properties of Materials
2. Temperature and Matter
3. Heat Energy and its Effects
4. Introduction to Thermodynamics
5. Heat Transfer and Refrigeration
6. Waves
7. Sound
8. Electrostatics
9. Circuit Elements
10. Magnetism
11. Light Waves

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IV. LEARNING ACTIVITIES/REQUIRED RESOURCES

1. Properties of Materials (Chapter 11)

- classification of materials
- Hooke's Law
- stress and strain
- modulus of elasticity
- density
- pressure
- pressure in a fluid
- measurement of pressure
- Pascal's Law
- buoyancy and Archimedes' Principle
- fluids in motion

2. Temperature and Matter (Chapter 12)

- temperature
- Avogadro's number and the mole
- Ideal Gas Law
- kinetic theory of gases
- speed distribution in gases
- thermal expansion

3. Heat Energy and its Effects (Chapter 13)

- the meaning of heat
- units of heat energy
- specific heat capacity
- melting and freezing
- vaporization and vapor pressure
- heat of vaporization
- boiling
- heat of combustion

4. Introduction to Thermodynamics (Chapter 14)

- the first law of thermodynamics
- expansion work
- isochoric, isothermal and adiabatic processes
- heat engines
- cyclic processes
- work per cycle
- the Carnot cycle
- internal combustion engines
- the second law of thermodynamics

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5. Heat Transfer and Refrigeration (Chapter 15)

- conduction
- convection
- radiation
- refrigeration

6. Waves (Chapter 17)

- transverse vs. longitudinal waves
- wavelength and frequency
- resonance

7. Sound (Chapter 18)

- nature of sound waves
- speed of sound waves
- sound Intensity

8. Electrostatics (Chapter 19)

- electric charge
- insulators and conductors
- Coulomb's law
- electric field
- potential energy

9. Circuit Elements (Chapter 20)

- electric current
- electromotive force
- Ohm's law
- capacitors
- electric power
- series and parallel circuits

10. Magnetism (Chapter 22)

- magnetic fields
- magnetic field and electric current
- galvanometer
- DC ammeter and voltmeter
- DC motor

11. Light Waves (Chapter 22)

- nature of electromagnetic waves
- electromagnetic spectrum
- light intensity

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V. EVALUATION METHODS:

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

Quizzes (announced)	30%
Mid-term test	35%
End-term test	35%

A+ = 90 - 100%

A = 80 - 89%

B = 70 - 79%

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. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor.

VII. REQUIRED STUDENT RESOURCES

Bueche, F. and Wallach, D.: Technical Physics. 4th edition, John Wiley & Sons, Inc.

VIII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:

Other college physics textbooks from the library.

IX. SPECIAL NOTES

Students with special needs (eg. 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.