

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: Applied Physics I

CODE NO. : PHY100-4

SEMESTER: I

PROGRAM: Civil, Electrical-Power, Environmental Engineering Technology

AUTHOR: *Subhash Verma P.Eng*

DATE: May, 08

PREVIOUS OUTLINE DATED: SEP, 01

APPROVED:

**“Brian Punch”
Chair**

**Sep 16 08
DATE**

TOTAL CREDITS: 4

PREREQUISITE: None

HOURS/WEEK: 4

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For additional information, please contact Brian Punch, Chair
School of The Environment, Technology, & Skilled Trades
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I. COURSE DESCRIPTION:

This course introduces the student to a number of fundamental concepts of physics, which should prove useful to students in the Architectural, Civil, Construction, Environmental, Pulp & Paper and Water Resources Engineering programs. Topics to be covered include: units of measurement, vectors, forces, accelerated motion, Newton's laws of motion, momentum, work, energy and power, simple machines, force systems, and moments and torques. The assumption is that many of the students will be seeing these concepts for the first time. Because of the number of topics and the potential for difficulties in some of the more complicated areas, the emphasis will be placed on *introducing* the student to the *concepts* rather than a *rigorous mathematical analysis* of the topics.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Write definitions for the concepts introduced, preferably in the student's own words
2. Answer questions requiring knowledge of concepts presented in class
3. Respond to questions requiring extrapolation of the course content.
4. Solve mathematical based problems requiring an understanding of the course theory.
5. Apply the knowledge learned in this course to other courses which are 'physics based'.

III. TOPICS:

1. Units of Measurement
 - System of units
 - Base quantities and base units
 - Derived units
 - Prefixes and abbreviations
 - Unit cancellation procedure
 - Significant digits and scientific notation

2. Vectors
 - Definition
 - Vector operations
 - Trigonometry
3. Motion
 - Vector and scalar quantities
 - Distance and displacement
 - Speed and velocity
 - Uniform Acceleration
 - Equations of uniform acceleration
 - Free fall
4. Force and Acceleration
 - Newton's first law of motion
 - Newton's second law of motion
 - Newton's third law of motion
5. Momentum and Impulse
 - Definition
 - Mathematical equation
 - Law of conservation of momentum
 - Collisions
6. Torque and Parallel Forces
 - Moments and torques
 - Parallel force systems
7. Work and Energy
 - Definitions and units
 - Power
 - Kinetic energy
 - Potential energy
 - Law of conservation of energy
8. Simple Machines
 - Definition
 - Lever
 - Pulley
 - Inclined plane
 - Mechanical advantage and efficiency
9. Properties of Matter
 - Solids, liquids and gases
 - Density and specific gravity
 - Hook's law

10. Fluids

- Pressure and fluid density
- Pressure and height relationship
- Buoyancy
- Fluid flow
- Continuity equation
- Bernoulli's equation

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Ewen, Nelson and Schurter, **APPLIED PHYSICS**, Eighth edition.
Pearson Canada, 2007. ISBN 0-13-110353-9

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade will be derived from the results of the tests and lab work and assignments, weighted as follows:

| | |
|----------------|-------|
| Tests | - 50% |
| Home work/quiz | - 25% |
| Tutorial | - 25% |

To pass the course a minimum of 50% score is required.
The following semester grades will be assigned to students in postsecondary courses:

| <u>Grade</u> | <u>Definition</u> | <u>Grade Point Equivalent</u> |
|--------------|---|-------------------------------|
| A+ | 90 - 100% | 4.00 |
| A | 80 - 89% | 4.00 |
| B | 70 - 79% | 3.00 |
| C | 60 - 69% | 2.00 |
| D | 50 - 59% | 1.00 |
| F (Fail) | 49% and below | 0.00 |
| CR (Credit) | Credit for diploma requirements has been awarded. | |
| S | Satisfactory achievement in field /clinical placement or non-graded subject area. | |
| U | Unsatisfactory achievement in field/clinical placement or non-graded subject area. | |
| X | A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the | |

| | |
|----|---|
| | requirements for a course. |
| NR | Grade not reported to Registrar's office. |
| W | Student has withdrawn from the course without academic penalty. |

VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources. Substitute course information is available in the Registrar's office.

Assignments/Laboratory Work:

Home assignments are due one week after they are assigned. Late submissions will be penalized. Laboratory work is an important component of this course. Performing laboratory experiments will reinforce the concepts discussed in the theory class. If required, changes will be made. However, students will be notified prior to any changes.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.