UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE: September 1992
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: December 2009
(Four years after UPAC final approval date) (MONTH YEAR)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Faculty of Science, Health & Human Services/Physics**

PHYS 231		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Thermodynamics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is designed for students who wish to pursue a career in engineering or physical science. This is an introductory course designed to study the fundamentals of heat, energy, and thermodynamics. Topics include temperature, heat, and the first and second law of thermodynamics, phase change, and the kinetic theory of gases.

NOTE: Beginning September 2007 PHYS 112 will be the new prerequisite for this course.

PREREQUISITES: **PHYS 111 and MATH 111 (Beginning September 2007 PHYS 112 will be the new prerequisite for this course)**

COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: **n/a** *(Course #)*
(b) Cannot take: **n/a** *(Course #)* for further credit.

SERVICE COURSE TO:
(Department/Program)
(Department/Program)

TOTAL HOURS PER TERM: **75**
STRUCTURE OF HOURS:

Lectures:	**75**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT: **36**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **Once every two years**

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☒ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☐ No

AUTHORIZATION SIGNATURES:

Course Designer(s): George McGuire; revised Rob Woodside
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Jackie Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: May 26, 2006

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

This course will attempt to broaden, and to deepen the students' present knowledge of thermodynamics. The emphasis will be on applications and problem solving, as this course is designed for students who plan to continue their studies in the applied sciences. After finishing this course, the students should be able to:

1. Demonstrate their understanding of thermodynamics by solving problems in heating and refrigeration;
2. Appreciate the uses of thermodynamics for other sciences;
3. Understand the importance and beauty of science to all of mankind.
4. Solve various problems in each of the topic areas listed in the Calendar Description section.

METHODS:

This course will be presented using lectures, tutorials and demonstrations. Problems will be assigned and marked weekly. Problem solving will emphasize the use of calculus methods and computers (numerical techniques).

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Please see the Physics PLAR policy on the department's webpage

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Carter, A.H., Classical and Statistical Thermodynamics, Prentice Hall (2001)

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments	20%
Mid-term	30%
Final Exam	50%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

1. Temperature: measuring, temp. and internal energy, temperature scales, thermal expansion.
2. Heat and the First Law of Thermodynamics: measuring heat capacity, specific heats, absorption and transfer of heat, the First Law of Thermodynamics.
3. Kinetic Theory of Gases: an ideal gas, Avogadro's constant, pressure and temperature, kinetic energy, equipartition of energy.
4. Second Law of Thermodynamics: engines, ideal engines, the Carnot Cycle, efficiencies, entropy.
5. Statistical Thermodynamics: probability distributions, Maxwell-Bottzmann law.