COURSE IMPLEMENTATION DATE: January 1995
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: November 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**

PHYSICS 311		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Statistical Physics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course introduces students to the advanced methods of statistical physics. Connections with thermodynamics are emphasized. Topics include canonical ensembles, partition functions, and quantum statistics.

PREREQUISITES: **Physics 231**
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: **24**
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): Rob Woodside
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Jackie Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: December 14, 2005

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

To introduce the student to the methods of statistical physics.
To enable the student to solve various problems in each of the topic areas listed in the Calendar Description section.

METHODS:

This course will be taught using lectures, demonstrations, seminars and student projects. Problems will be assigned and marked on a regular basis.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

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

METHODS OF OBTAINING PLAR:

Departmental Review and/or Course Challenge

TEXTBOOKS, REFERENCES, MATERIALS:

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

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

REFERENCES:
Fundamentals of Statistical and Thermal Physics, F. Reif, McGraw Hill (1965)

Thermal Physics, Kittel

Statistical Mechanics, Huang

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

Assignments	25%
Midterm Examination	30%
Final Examination	45%

COURSE CONTENT:

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

(An example taken from 'Reif':

Week	Topic	Reif Chapter
1 - 2	Introduction to statistical methods (Random Walk)	1
3 - 4	Statistical description of systems of particles	2
5 - 6	Brief review of thermodynamics	4 - 5

7 - 8	Basic methods - microcanonical and grand canonica ensembles and connection with thermodynamics	6
9 - 10	Applications - partition functions, ideal gases, conduction electron theory, equipartition theorem, paramagnetism, equilibrium of dilute gases	7 - 8
11 - 12	Quantum statistics	9

Legendre Transformation; Thermodynamic Potentials; Gibbs Phase Rule; Partition Function; Lagrange Multipliers; Boltzmann Statistics and Ensembles; Distributions (Boltzman, Fermi-Dirad and Bose-Einstein); Gases (Maxwell-Boltzmann, Fermi-Dirad and Bose-Einstein); Information theory.