

PHYS 124: THERMODYNAMICS AND STATISTICAL MECHANICS

In Workflow

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Approval Path

1. Wed, 30 Nov 2022 18:32:41 GMT
Mikkel Jensen (mikkel.jensen): Approved for PHYS Committee Chair
2. Mon, 05 Dec 2022 21:47:40 GMT
Chris Taylor (ctaylor): Approved for PHYS Chair
3. Thu, 08 Dec 2022 03:50:25 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Thu, 08 Dec 2022 17:42:38 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

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Viewing: PHYS 124 : Thermodynamics and Statistical Mechanics

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Changes proposed by: Mikkel Jensen (218650862)

Contact(s):

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Catalog Title:

Thermodynamics and Statistical Mechanics

Class Schedule Title:

Thermodynamics+Stat Mech

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Physics and Astronomy

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Fall 2023 (2023/2024 Catalog)

Subject Area: (prefix)

PHYS - Physics

Catalog Number: (course number)

124

Course ID: (For administrative use only.)

158411

Units:

3

Is the only purpose of this change to update the term typically offered or the enforcement of existing prerequisites at registration?

No

In what term(s) will this course typically be offered?

Spring term only

Does this course require a room for its final exam?

Yes, final exam requires a room

This course complies with the credit hour policy:

Yes

Justification for course proposal:

This course has been taught in the Physics and Astronomy Department, and is one of the key upper-division courses required by all our programs. However, no official learning outcomes were on the record in the new workflow system. This course change proposal does not introduce any changes to the course, but simply introduces the agreed-upon learning outcomes to this workflow system.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

Basic concepts and laws of thermodynamics and thermal properties of matter; kinetic theory of gases; use of distribution functions and ensembles in statistical mechanics; connection of probability and entropy; quantum statistics; applications to various systems.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Is this course designated as Curricular Community Engaged Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

Yes

Prerequisite:

MATH 45, PHYS 11A, PHYS 11B, PHYS 11C.

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Discussion

Discussion Classification

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

Discussion Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre- and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Understand the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, chemical potential, free energies, partition functions, and thermodynamic driving forces.	Quizzes, midterms, homework, final exam.
2	Analyze thermodynamic problems using the concepts of state properties such as temperature, pressure, entropy, and volume, and process variables such as heat and work.	Quizzes, midterms, homework, final exam.
3	Apply thermodynamic concepts such as quasistatic, reversible, adiabatic, intensive, extensive, and isothermal to solve problems in thermodynamics.	Quizzes, midterms, homework, final exam.
4	Apply the concepts and laws of thermodynamics to solve problems in thermodynamic systems, such as gases, heat engines, refrigerators, and system phase transitions.	Quizzes, midterms, homework, final exam.
5	Explain how a given partial derivative relation relates to a particular experimental measurement.	Quizzes, midterms, homework, final exam.
6	Use the methods of statistical mechanics (in particular, the Boltzmann ratio and summation over probabilities) to solve for thermal properties in equilibrium.	Quizzes, midterms, homework, final exam.

Attach a list of the required/recommended course readings and activities:

Syllabus PHYS 124 2019-S.docx

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:**Programs:**

BA in Physics

BS in Physics

BS in Physics (Applied Physics)

BA in Physics (Teacher Preparation)

BS in Physics (Biophysics)

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines

Knowledge of human cultures and the physical and natural world

Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

No

Key: 3910