

## Faculty Senate Course Form

Effective Date:

Submission Date:

Department:

College of: Course

Contact Person:

Prefix:

Create New, Revise, Inactivate, or Reactivate:

Course #:

### Course Form:

- Used to create new course numbers or new prefixes.
- Used to change Name, Grading, Hours, Description, Reactivate
- Used to inactivate a course from the current catalog. Courses are never deleted. They are made inactive and can be legislated to become active again.

1. Purpose/Justification for the Changes:

2. Is this related to, and/or affect, any other department/college/unit curricula or programs at Pittsburg State University? *If "Yes", please provide an explanation. Provide documentation of any discussions (e.g. copies of emails, memos, etc.) that have occurred.*

Yes

No

3. Is this course to be considered for General Education?

*If "yes" this requirement will need approval of the General Education Committee after the revisions have been approved by Faculty Senate. The General Education Course Approval form will also need to be submitted.*

Yes

No

4. Will this course be required of any education majors?

*If "yes," this requirement will need approval of the Council for Teacher Education before upload to " College Curriculum Legislation" in SharePoint.*

Yes

No

5. Will additional resources or costs be required?

Yes

No

If so, what will be needed?

PSU Faculty Senate 24-25

6. Will any additional course fees be required (e.g. equipment, clothing, travel, licensing, etc.)?  
*If "yes," complete the Course Fee Form on the Faculty Senate website, it will need to gain approval of the President's Council.*

Yes                      No

7. Objectives/Student Learning Outcomes for NEW courses only, as it will appear in the syllabus:  
**Attach with upload.**

8. Assessment Strategies (e.g. exams, projects, university rubric, etc.), as it will appear in the syllabus:  
**Attach with upload.**

**Course Numbers cannot be changed, only created.**

	Existing	New/Proposed
Title:		
Course Number:		
Credits:		
Grading System:		
Pre/Co-Requisite(s):		
Course Description:		

## Authorization Sign-Off

**Checklist: Check once verified.**

- Required fields completed.
- Syllabus attached for new courses
- Assignment Strategies Attached

-Approved: Department Chair/Director

Date: \_\_\_\_\_

Signature, Chair/Director: \_\_\_\_\_



-Approved: College Curriculum Committee

Date: 1/13/25

Signature, Committee Chair: \_\_\_\_\_



-Approved: Dean of College

Date: 1/13/25

Signature, Dean: \_\_\_\_\_



-Approved: Council for Teacher Education (if applicable)

Date: \_\_\_\_\_

Signature, Council Chair: \_\_\_\_\_

-Approved: University Undergraduate Curriculum Committee

Date: \_\_\_\_\_

Signature, Committee Chair: \_\_\_\_\_

-Approved: Faculty Senate

Date: \_\_\_\_\_

Signature, Recorder Faculty Senate: \_\_\_\_\_

Originating Departments(s): After completing this form, please upload it to the SharePoint, within the appropriate College folder, "Preliminary Legislation", to allow for review and questions. Any modifications should be saved as "original file name.v2.docx" and uploaded as well.

Following final College Curriculum Committee approval, please apply the appropriate signatures, and send them to your College Administrator.

**Pittsburg State University**  
**Department of Engineering Technology**  
**Mechanical Engineering Technology Program**  
(Prepared by: David Miller 08/2024)

**COURSE TITLE:** MECET 428-01 - Thermodynamics

**COURSE SCHEDULE:** Face-to-Face, T/Th 2:00-3:15pm, KTC W203

**INSTRUCTOR:** David Miller, PhD  
Office: KTC W224c  
Office Hours: MW 1:30-2:30, TTh 1:00-2:00, F 10:00-11:00

Phone: (620) 235-6115  
E-mail: [djmiller@pittstate.edu](mailto:djmiller@pittstate.edu)

**COURSE DESCRIPTION:** MECET 428 – Thermodynamics. 3 Hours. (3 hours lecture). Heat, temperature, laws of thermodynamics and their applications. Includes software simulations and project work to apply thermodynamic theories. May be taken for honors. Prerequisite: PHYS 100 College Physics I or PHYS 104 Engineering Physics I.

**TEXTBOOK/MATERIALS REQUIRED:**

- Sonntag, R.E., Borgnakke, C., *Introduction to Engineering Thermodynamics*. (2<sup>nd</sup> Ed.), Wiley, ISBN 9780471737599 (available for checkout from the KTC Library)
- Scientific Calculator, Engineering Paper, Electronic Data Storage (Jump Drive or Cloud Storage)
- *FE Supplied Reference Handbook*. Free PDF from [NCEES website](https://www.ncees.org). (Optional, requires account)

**COURSE OBJECTIVES:**

- Objective 1 - Obtain knowledge of the fundamental principles of thermodynamics.
- Objective 2 - Apply these principles to practical, real-world processes in a variety of disciplines (ABET Objective 2).
- Objective 3 - Develop skills in the analysis of engineering design problems involving practical thermodynamic systems.
- Objective 4 - Apply algebra, analytical techniques, and spreadsheets for problem solving. (ABET Objective 1)

**COURSE TOPICS:**

- Introduction to the laws of thermodynamics
- Properties of perfect and mixed fluids
- Reversible vs. Irreversible processes
- Heat Engine Cycle, Steam Cycle and Combustion
- Applications of thermodynamic principles
- Fundamentals of heat-transfer modes

**GRADING SYSTEM:** Grades will be based on the following scale and proportional system

90 - 100	A		
80 - 89	B	Design Problems/Tutorials	15%
70 - 79	C	Quizzes	25%
60 - 69	D	Tests	60%
59 - 0	F		

## TENTATIVE SCHEDULE OF ACTIVITIES

*Subject to change*

<b>Week</b>	<b>Date</b>	<b>Class Content</b>	<b>Reading</b>	<b>Assignments Due</b>
1	08/20 08/22	Introduction, General Concepts & Definitions	Ch. 1 & 2	Quiz Syllabus Quiz
2	08/27 08/29	Pure Substances	Ch. 3	Quiz
3	09/03 09/05	Work and Heat	Ch. 4	Quiz
4	09/10 09/12	The First Law of Thermodynamics	Ch. 5	Quiz
5	09/17 09/19	Review <i>Exam 1</i>		
6	09/24 09/26	Analysis Using Control Volumes	Ch. 6	Quiz
7	10/01 10/03	The Second Law of Thermodynamics	Ch. 7	Quiz
8	10/08 10/10	Entropy	Ch. 8	Quiz
9	10/15 10/17	Analysis Using Control Volumes	Ch. 9	Quiz
10	10/22 10/24	Mixed Gasses	Ch. 10	Quiz
11	10/29 10/31	Review <i>Exam 2</i>		
12	11/05 11/07	Power & Refrigeration	Ch. 11	Quiz
13	11/12 11/14	Power & Refrigeration (cont'd) Chemical Reactions	Ch. 11, 12	Quiz
14	11/19 11/21	Chemical Reactions (cont'd) Intro to Heat Transfer	Ch 13	Quiz
<b>15</b>	<b>11/26 11/28</b>	<b>Thanksgiving Break – No Class</b>		
16	12/03 12/05	Review Lab Time to work on Tutorials		
<b>17</b>	<b>12/10</b>	<b>Exam 3 2:00-3:50pm</b>		

Pittsburg State University encourages students to take full advantage of campus resources. Information about the campus resources and other information, notifications, and policies (academic integrity, dead week, etc.) students should be aware of, can be found through the syllabus supplement link for the current semester that can be found on PSU's web site at <https://www.pittstate.edu/registrar/syllabus-supplement.html>

## **Additional Details/Descriptions:**

**Course Prerequisites:** In order to succeed, students must be familiar with algebra, as well as concepts of physical units (temperature, pressure, energy, work, volume, length, time), orders of magnitude and scientific notation. Students should have a basic understanding of the Windows or Mac operating system (zipping and unzipping files, opening and saving files, etc). Use of Canvas and the Internet are required in this course. Prior knowledge about 3D modeling and simulation using SolidWorks is required.

**Attendance:** The course meets for lecture one hour and 15 minutes two times a week. Attendance may be taken during each lecture at the instructor's discretion. Attendance will NOT be taken for a grade; however, students are encouraged to attend at least one session to cover questions regarding the week's tutorial assignment. Thursdays will typically be reserved for quizzes; Quizzes will be given during normal class time in the scheduled location. In-person courses may shift to online activities in the event of campus closure/inclement weather; check Canvas for additional requirements should this become necessary.

**Classroom Etiquette:** Students are strongly encouraged to participate in the lectures through early preparation and questions or comments in class but are asked not to monopolize the entire class period. Students are required to behave in a professional manner and respect the learning environment of others. If students must come in late or leave early, please notify the instructor beforehand and do so in a quiet, non-disruptive manner. Please silence and store all electronic devices and refrain from engaging in distracting activities on the computers. The instructor reserves the right to remove any device deemed to be causing a disruption - this includes, but isn't limited to: cell phones, tablets, eReaders, eCigarettes.

**Homework:** Homework problems will be posted covering each topic and discussed in class. Homework will not be graded; rather they are meant for students to complete prior to a given class period to aid in the discussion. A student having difficulty with a homework problem is encouraged to discuss the problem with fellow students, tutors and the instructor. It is strongly recommended that students KEEP UP WITH THE HOMEWORK!!!

**Methods:** Solutions to problems solved on tests and homework must be logical and based on the subjects of the course. A solution must be understood by the student, fellow students, instructor, and other individuals, today and in the future. A standard solution approach will be required for all homework to support clear and concise communication of information. A solution will include: **name** and **date**, **design conditions** (given), **assumptions**, **formula**, **sketch** (schematic, flow diagram), **control volume/mass/surface** and clearly identified **answer** (with units). Illegible solutions may result in no credit.

**Quizzes:** Most weeks a short (10 minute) quiz will be given during the class period to re-enforce topics from the previous week's lecture and readings. Quizzes must be taken in the normal meeting location unless arranged ahead of time via email. Quizzes are closed-book, closed-note, closed-Internet, and closed-friend. The lowest quiz score will be dropped, so no make-ups will be permitted except in extreme circumstances. The instructor reserves the right to give additional quizzes at his discretion.

**Design Problems/Tutorials/Project:** Short real-world problems or software tutorials in simulation and analysis software packages will be assigned at various points throughout the semester to familiarize students with state-of-the-art tools used in systems analysis. Some class time may be given for work on tutorials, but it is expected that students spend time outside of class to complete the required work.

**Tests:** Three equally weighted tests will be given to evaluate the student's understanding of the course topics. Tests are comprehensive and administered on Canvas during the normal class meeting time. Students will be allowed to use the *FE Supplied Reference Handbook* during tests (hard copies will be provided for use during the exam for those on campus; students taking exams off campus are responsible for their own copies); other than this reference, all tests will be closed book, closed notes and closed

homework. Partial credit MAY be given based on student's hand written calculations at the instructor's discretion. Calculation sheets must be turned in at the conclusion of the exam and must follow the guidelines outlined in the Methods section above. Rescheduling tests will only be done under special circumstances and only by notifying the instructor ahead of time via email.

**Missed and Late Work:** No work will be accepted after the given due date unless due to a documented medical necessity or a documented school event. With the exception of documented emergencies, any missed work must be discussed in advance through email. If a student must miss class due to illness, that student should contact the faculty via email as soon as possible to make arrangements.

**Tutorial Write-ups:** Technical communication is important in industry, so it will be evaluated after each tutorial exercise. Each student is required to provide a written summary of his tutorial experience. Specifics about the format of the report will be covered at the time of assignment.

**Grading Policy:** Students must maintain a passing grade in the following course categories: Design Problems/Tutorials, Quizzes, and Tests. A failing grade in any of these categories will result in a maximum final grade of D in the class, regardless of the grades in the other class categories. Grading policies and rubrics for individual assignments will be provided at the time of announcement.

**Software:** The course will be administered with the Canvas system. The site will maintain course materials and be used for communications, problem submissions and grading. The site should be checked frequently. Exams use the Respondus Browser and possibly Respondus Monitor, so please make sure you are set up beforehand. The design problems/tutorials require students to have access to SolidWorks. This software is available in many labs in the KTC, but in many cases there are versions available for use on personal computers. Contact the instructor if you wish to obtain software for your own personal machine. Most Mac or Chrome computers do NOT support SolidWorks.

**Academic Dishonesty:** Submitting someone else's work as your own will not be tolerated in this class. Working together on homework assignments is encouraged, but EACH individual must show ALL work for EVERY problem themselves. Examples of academic dishonesty include, but aren't limited to: cheating on assignments or tests, submitting someone else's work as your own, giving your work to someone else, use of solution manuals/assignments from previous semesters, not citing sources on a writing assignment. Determination of what is or is not academic dishonesty is at the discretion of the instructor. If your work is considered to be an act of academic dishonesty all parties will automatically receive a zero on that assignment, and the University Office of Student Rights and Responsibilities will be notified. Your actions could also cause you to receive an 'F' in the course and could result in severe penalties, up to and including dismissal from the university.

**Communication Policy:** Students are encouraged to interact with the instructor outside of class via email. Questions sent via Canvas or email will typically be answered within less than 24 hours if received between 8:00am Mondays and 4:00pm Fridays; however, any questions asked outside of the "normal business week" may result in longer than normal response times. The instructor will not discuss homework/tests/assignments within 24 hours of the due date or 24 hours of when they are handed back.

**SPECIAL CONCERNS:** Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact me as soon as possible to make necessary accommodations; 7-10 days prior notice prior to an exam is appreciated to allow time to provide necessary materials to the Testing Center.