

Instructor

Dr. Ashish Aphale

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Office Location: Q- 103 B

Office Hours: T-Th 10-11:00 am



**KENNESAW STATE
UNIVERSITY**

SOUTHERN POLYTECHNIC
COLLEGE OF ENGINEERING AND
ENGINEERING TECHNOLOGY

Department of Mechanical Engineering

Faculty Web Page: <http://facultyweb.kennesaw.edu/aaphale/>

Course Description

Catalog Description (Credit Hours: 1)

This course involves conducting experiments in order to understand the heat transfer modes such as conduction, transient conduction, convection, and radiation.

Prerequisites

ME 3410 (Thermodynamics). If you do not meet the prerequisite requirements, you are expected to withdraw from this course. If it is discovered that a student is lacking in prerequisites (at any time during the semester), the instructor reserves the right to remove the student from the class and assign a grade of W (or WF if past the drop date).

If you do not meet the prerequisite requirements, you are expected to withdraw from this course. If it is discovered that a student is lacking in prerequisites (at any time during the semester), the instructor reserves the right to remove the student from the class and assign a grade of W (or WF if past the drop date).

Course Details

Semester: Fall 2022

Course name: Heat Transfer & Thermo Lab

Course number: ME 4403

Section number: 05

Meeting times: M 3:30-6:15 pm

Room number: Engineering Technology Center, Room 241

Course Learning Outcomes

Upon completion of this course, students should have the ability to:

1. Analyze and interpret thermal data and write lab reports.
2. Conduct experiment(s) on the heat transfer modes of convection, radiation, and conduction.
3. Conduct experiment (s) involving transient heat transfer.
4. Conduct experiment(s) on thermodynamics power cycles.
5. Conduct experiment(s) on refrigeration cycles
6. Conduct experiment(s) on IC Engines

Performance Indicators for Assessment of ME Program Student Outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences
3. An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Topics covered

- Design of an apparatus to measure thermal conductivity of a material
- Performance analysis of a solar collector
- Transient heat conduction experiment
- Performance analysis of a Heat Exchanger
- Latent Heat calculation
- Natural and forced convection heat transfer
- Calculation of COP for a Refrigeration Cycle
- Demonstration of an IC Engine operation
- Rankine Cycle Operation

Textbook

- Required: Cengel, Yunus A, and Ghajar J. Afshin., Heat and Mass Transfer: Fundamentals and Applications, 5th Edition , McGraw-Hill, New York, 2011 ISBN 10: 9814595276
- Recommended Text: J.P Holman, "Heat Transfer", tenth edition, McGraw-Hill, New York, ISBN-10: 0073529362

Important Dates

- First day of class: Aug 15, 2022
- Add/drop date: Aug 15-19, 2022
- Last day to withdraw: Oct 11, 2022 (w/o penalty)
- Last day of classes: Dec 5, 2022
- Final Exams start: N/A

Course Delivery

KSU may shift the method of course delivery at any time during the semester in compliance with University System of Georgia health and safety guidelines. In this case, alternate teaching modalities that may be adopted include hybrid, synchronous online, or asynchronous online instruction.

COVID-19 Illness

If you are feeling ill, please stay home and contact your health professional. In addition, please email your instructor to say you are missing class due to illness. Signs of COVID-19 illness include, but are not limited to, the following:

- Cough
- Fever of 100.4 or higher
- Runny nose or new sinus congestion
- Shortness of breath or difficulty breathing
- Chills

- Sore Throat
- New loss of taste and/or smell

COVID-19 vaccines are a critical tool in “Protecting the Nest.” If you have not already, you are strongly encouraged to get vaccinated immediately to advance the health and safety of our campus community. As an enrolled KSU student, you are eligible to receive the vaccine on campus. Please call (470) 578-6644 to schedule your vaccination appointment or you may walk into one of our student health clinics.

For more information regarding COVID-19 (including testing, vaccines, extended illness procedures and accommodations), see KSU’s official [Covid-19 website](#).

Face Coverings

Based on guidance from the University System of Georgia (USG), all vaccinated and unvaccinated individuals are encouraged to wear a face covering while inside campus facilities. Unvaccinated individuals are also strongly encouraged to continue to socially distance while inside campus facilities, when possible.

Technical Requirements

Access to D2L is essential for the course material and instructions.

Grading Policy

Report-organization & neatness	
Results	75%
Discussions	
Quiz	25%
Total	100%

Grade Conversion: A: (90-100), B: (80-89), C: (70-79), D: (60-69), F: (0-59)

Course Expectations

Course Communication

Students are expected to check emails and D2L for the updates or questions related to the course. All the lecture notes, assignments and any announcements will be communicated through D2L.

Students are required to email me from their outlook account (not from D2L) for any communication. It is your responsibility to check D2L for any announcements and due dates that I post. Be sure to check D2L regularly.

Attendance Policy

Students are expected to attend all classes for their full length. Significant absence in class may result in grades penalty. See section below on *Staying Home When Sick*.

Report

All reports will be due as mentioned on D2L. It must be presented with the mentioned format as a professional looking, scanned, document. Include schematics, proper labeling, pertinent property diagrams, assumptions, equations to be used, etc. Any report turned in after the due date will be considered late and 1/3rd of the possible score will be lost. After three days of delay, the student will receive zero grade for that report. All reports will be submitted through D2L

Course Outline

- * Note that the Instructor may update the schedule any time. See online version on D2L for updates. See *Assignments* and Announcements on D2L for specific homework problems that may be collected for grading and their due dates.

Week	Description
1	Design of an apparatus to measure thermal conductivity of a material
2	Performance analysis of a solar collector
3	Quiz 1
4	Transient heat conduction experiment
5	Calculation of COP for a Refrigeration Cycle
6	Quiz 2
7	Heat Exchangers
8	Latent Heat calculation
9	Quiz 3
10	Natural Convection Experiment
11	Forced Convection Experiment
12	Radiation Experiment
13	Quiz 4
14	Demo Lab on Rankine Cycle and Stirling Engine

KSU Academic Integrity Statement

Every KSU student is responsible for upholding the provisions of the [Student Code of Conduct](#), as published in the Undergraduate and Graduate Catalogs. Section 5c of the Student Code of Conduct addresses the university’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an “informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement.

Help Resources

Contacts to get Help

Student Help Desk: email studenthelpdesk@kennesaw.edu or call 470.578.3555 or go to this webpage for the [KSU Service Desk Portal](#) or go to: <https://uits.kennesaw.edu/>

All Federal, BOR and KSU Student Policies, and COVID-19 Policies

<https://cia.kennesaw.edu/instructional-resources/syllabus-policy.php>

KSU Student Resources (including Wellness and Academic)

<https://cia.kennesaw.edu/instructional-resources/syllabus-resources.php>

KSU Coronavirus (COVID-19) Information and Recourses

<https://coronavirus.kennesaw.edu/>

SPCEET College CLUE Center (formerly the Peer Tutoring Center)

The Southern Polytechnic College of Engineering and Engineering Technology CLUE (Collaborative Learning for Undergraduate Engineering) Center provides free peer-based academic support for a selection of engineering and engineering technology courses. Tutoring is offered Monday through Saturday, both face-to-face and online. Face-to-face tutoring is in room 306 of the Engineering Technology Center (Building Q) on a drop-in basis and online is by [appointment](#). Tutoring for a given subject is available according to a weekly schedule, based on the tutors' availability. During those hours, students are welcome to receive tutoring from a peer who has already earned either an A or a B in the course. For additional information, visit the [CLUE Center website](#).

Basic Needs Security Statement

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact CARE Services (care.kennesaw.edu). The Campus Awareness, Resource and Empowerment (CARE) Services offers support to students who have experienced homelessness, food insecurity and/or the foster care system. Contact them at 470-578-5260 or careservices@kennesaw.edu for help.



KSU CARES

CAMPUS PANTRY
KSU CARES provides food for ANY KSU student. Pantries located on both campuses.

CASE MANAGEMENT
Case Managers provide students with individualized plans intended to empower the student to work towards their daily living needs.

KENNESAW CAMPUS
Carmichael Student Center, Room 172

MARIETTA CAMPUS
JMW Student Center, Room 184

care.kennesaw.edu | 470-578-5260
CARE always Cares



EMERGENCY ASSISTANCE PROGRAM

ELIGIBILITY
Open to all currently enrolled KSU students with a FAFSA on file.

FINANCIAL ASSISTANCE
Financial assistance is available on a case-by-case basis to assist students in overcoming unforeseen hardships.

CONNECTION TO RESOURCES
Beyond financial assistance, staff work to connect students with on-campus and off-campus resources to relieve financial burdens.

emergencyassistance.kennesaw.edu
CARE always Cares

