ME5122 Applied Thermodynamics
University of Colorado Denver, College of Engineering and Applied Science

Course Number: ME5122, Fall 2009
Instructor: Dr. Sean Wright
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Phone: (303) 556-8348
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Office Hours: T,Th 2:30 to 3:30 PM Room NC3514A
Classes: T,Th 4:00 to 5:15 PM, WC140 (West Classroom)

WHAT THIS COURSE IS ABOUT

Thermodynamics is about ENERGY. It is about energy storage, transformation and transport. And it’s about how we use material (working fluids) to store, transport and convert energy from one form to another. Engineers use thermodynamics to design and analyze energy conversion systems like the propulsion systems in aircraft, submarines and sports cars, and electricity generating systems. This course will cover the first law of thermodynamics (that energy is conserved) and the second law (real processes produce entropy and dissipate the value of energy). The second-law of thermodynamics imposes the upper limit on the performance of energy conversion processes. These two laws will be utilized and applied in an effective form of applied analysis called exergy analysis. The force-flux approach of irreversible thermodynamics may also be considered. Topics such as thermodynamics of viscous flow and statistical (microscopic) thermodynamics are not part of this course.

Topics Covered (Tentative):

1st and 2nd Laws of Thermodynamics (ch. 1 & 2)
Exergy Analysis and Optimization (ch. 3, 5 & 11)
Force-Flux approach of Irreversible Thermodynamics (ch. 12)
Single Phase Systems and Chemically Reactive Systems (ch. 4 & 7)
Exergy Analysis of Power Generation (ch. 8) and other Selected Applications if time permits.

Approximately six assignment sets will be assigned and usually due the after a week and a half or the 3rd class after it is assigned (see the schedule).
Late homework must be turned in before the answers are reviewed in class and the following penalties apply to late submissions:

- If due on a Tuesday: -10% for Thur before class, -25% for next Tuesday
- If due on a Thursday: -10% for Fri., -15% for Tuesday before class

There will be a midterm and a comprehensive final. The final may be part take-home with a limited time allowed for completion. Grades may be scaled if deemed necessary.

**Grading:** Your best overall grade through option A or B will automatically be calculated.

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<td>Final</td>
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**Note for Military Personnel:**

If you are a student in the military with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact Paul Rakowski. If you will be away for training arrangements can be made with the instructor.

**Additional References:**

*Undergraduate thermodynamic textbooks that include exergy analysis, such as:*
- Thermodynamics, An Engineering Approach, by Y. Cengel and M. Boles, 5th or 6th edition
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UG Finals Week
UC Denver – Downtown
Dates and Deadlines*
ACADEMIC CALENDAR
Fall 2009

Students are accountable for knowing and following these deadlines.
- Students must use and regularly check their UC Denver assigned e-mail address.
  University communication will be sent to your UC Denver assigned e-mail address.

April 6
- First day to register. Check S.M.A.R.T. for your registration date and time. Before registration, all students must pay a $200 registration advance payment, which will be applied to your tuition and fees. See billing information below.
- Final day to apply for fall graduation. See your advisor.

August 16
By 6:00pm
- Last day to withdraw from all classes and receive refund of $200 advance payment and no tuition assessed.

August 17
- First day of Fall semester classes.
- First day faculty/staff may register with a tuition waiver.
- Last day to petition for resident tuition status.

August 23
LAST DAY TO:
- Add courses and waitlist using S.M.A.R.T
  - If you are on the waitlist, read waitlist “How to”
  - NOTE: If your course does not appear as “enrolled” on your schedule by Census Date, you are not enrolled in the course.

August 24
- No adds permitted today.
- Last day to drop a course without a $100 drop charge.

August 25
- First day instructor may approve a request to add a student to a closed course using a Schedule Adjustment Form.

Between August 25 and September 2:
- Courses may be added using a Schedule Adjustment Form with instructor's approval and signature.
- Independent study, internship, thesis, and dissertation credit may be added with required signatures approvals using a Special Processing form.
- Late starting module or intensive courses may be added up until the first day of class. After that, those courses may be added with instructor's approval and signature.

September 2
CENSUS DATE
By 8:00 PM

LAST DAY TO:
- DROP full-term courses (possible financial adjustment).
- After this date, dropped courses require instructor's approval and signature and will appear on your transcript.
- Withdraw from the term.
- After this date, complete withdrawal (all courses dropped) requires the signature of your dean (no tuition adjustment).
- Signature of financial aid required if student has financial aid (loans, grants, or scholarships).
- ADD full term courses (except thesis, independent study and internships). After this date, student will be charged the full tuition amount for additional course(s) added.
- College Opportunity Fund hours will not be deducted from eligible student's lifetime hours.
- Request a No Credit or pass/fail grade for a course.
- Register as candidate for degree.
- Apply for fall graduation.
- Petition for reduction in dissertation hours.
- Submit faculty start tuition waiver forms.

September 7
- Labor Day Holiday (campus closed/no classes)

October 27
- First day Registrar's Office requires dean's signature to drop or withdraw. NOTE: your college may require dean's approval prior to this date; please see your advisor.

November 23-29
- Fall Break (no classes; campus open)

November 26
- Thanksgiving Day Holiday (campus closed/no classes)

December 1
- Last day to authorize for College Opportunity Fund (COF) via S.M.A.R.T. Students may continue to authorize through finals at the Registrar's Office.

December 7-12
- Finals Week.

December 12
- End of semester. Commencement.

December 22
- Fall Final grades available on S.M.A.R.T.

January 28

INTENSIVE AND MODULE COURSES:
Intensive courses are short format (less than five weeks). They require the same number of classroom hours, and the same amount of work as a full-term class, per credit.
Module courses are classes lasting five or more weeks but less than the full term. They require the same number of classroom hours, and the same amount of work as full-term courses. Module courses meet:

First five weeks: August 17 - September 15
Second five weeks: September 21 - October 24
Third five weeks: October 26 - December 5

Adds after 1st class to start of 3rd class require instructor signature; drops after 2nd class to start of 3rd class require instructor signature. Drop charges apply the first day of class or later. Drops or withdrawal after 3rd class meeting require special approval from student's dean, no tuition adjustment.

ACADEMIC CALENDAR 2010

Spring 2010 (tentative)
- Martin Luther King Day - No classes; campus open.........................Jan 18
- Classes Begin ..................................................Jan 19
- Spring Break - No classes; campus open .................................March 22-28
- End of Term ..................................................May 15

Summer 2010 (tentative)
- Memorial Day Holiday - Campus closed..................................May 31
- Classes Begin ..................................................June 1
- Independence Day Holiday - No classes; campus closed .............July 4
- Independence Day Holiday (observed) - No classes; campus closed July 5
- End of term ...................................................July 31

BILLING INFORMATION
(See S.M.A.R.T. or OU Access portal for your current account balance)

- Please be aware there is a required registration advance payment of $200.00. This payment must be made before you can register. The only exception to this requirement is if the Financial Aid Office has received your FAFSA data and you have completed the University Application for Financial Aid.
- 1st day of the term through the following Monday – If the student withdraws from all classes for the term, he/she will forfeit $200, which corresponds to the $200 registration advance payment.
- Beginning the second Tuesday of the fall and spring terms until Census Day. If a student drops a course, a $100 drop charge will be assessed. If a student withdraws before the third week of classes, all tuition and other fees will be removed, but a drop charge of $100 will be assessed for each course.

STUDENTS ARE RESPONSIBLE FOR COMPLYING WITH TUITION FEES DEADLINES. UNPAID TUITION WILL BE SUBJECT TO A 7.5% SERVICE CHARGE. ADDITIONALLY, PAST DUE ACCOUNTS MAY BE ASSESSED A 20% INTEREST COLLECTION FEE ON THE UNPAID BALANCE FOR DETAILS INFORMATION ON PAYMENT DATES AND POLICIES, CALL 303-556-2710 or visit Student Billing.

The University of Colorado Denver has implemented an official E-Bill (electronic billing) program. Beginning with the Fall 2008 Term, UC Denver no longer mails paper billing statements to students. All registered students must access their student account bill through the OU Access portal.

* Extended Studies/Continuing and Professional Education student dates & deadlines may vary – see your advisor.