Instructor: Webster Johnson ("Dr. J."), Ph.D., OCNL 418, 898-5579, wrjohnson@csuchico.edu
Office Hours: TBA (See class page on Bb Learn)

Classes
Lecture: TuTh 9:30-10:45 AM, PLMS 205
Activity: Tu 2: – 3:50 PM, PLMS 205

Prerequisites: CIVL 321, Fluid Mechanics; MECH 332, Thermodynamics.
Recommended: MECH 306, Equation Solving Techniques

One of the following editions:
   8th Edition (Digital or Loose-Leaf): (available in bookstore Link)
   7th Edition (internet sources)

Note: The WileyPlus bundle is not necessary

Software Excel, Matlab

Internet: Lecture slides, text problem homework and solutions, design problems, test equation sheets, and other course material are posted on Blackboard Learn.

Grading:
<table>
<thead>
<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Homework Problems</td>
<td>15%</td>
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<tr>
<td>Activities</td>
<td>5%</td>
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<tr>
<td>Design Problems (2)</td>
<td>20%</td>
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<tr>
<td>Midterm Exams (2)</td>
<td>40%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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Grade Schema

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Homework: There will be approximately 10 homework problem sets assigned during the semester. Problem solutions must be neat, legible, numbered, arranged in assigned order, written on only one side of the paper, and stapled. Solution analysis must follow a specific methodology, which is outlined in section 1.4 of the textbook and used for all text examples.

Homework is due at the beginning of class on the due date. Late homework is not accepted. Homework submitted by e-mail is not accepted.

Design Problems
Two design problems will be assigned that focus on particular heat transfer applications. It is an open-ended problems that require more creative thought than homework problems. Required report format will be given with the assignment

Activity Session:
The Tuesday activity sessions will be used for midterm exams, class exercises, lecturing, and some demonstrations. Participation in class exercises represents 5% of the course grade. Always bring your textbook and laptop to the activity session.

Examinations:
There will be two, 2-hour midterm exams and a 2-hour final exam. The midterm exams will be given during the activity session on Tuesday. The midterms and final exam will cover the subjects...
since the previous exam. The exams are on-line, thus answers should be written on white paper, converted to one PDF file and submitting to the appropriate Bb Learn assignment drop-box.

**If you know you are going to miss an exam due to illness or other legitimate reason, you must contact me before the exam.** Make-up exams are only allowed for pre-arranged, legitimate absences.

**Email:**
If you need to contact me outside of class or office hours, please use email. It is expected that all students will monitor their Wildcat email accounts as I will use this system to make important announcements from time to time. You can set up automatic forwarding of your Wildcat email to another preferred email provider at

**Cell Phones:**
All alert sounds on your cell phone must be turned off during class. Cell phone use during class is not tolerated, except for emergency situations (911).

| Covid | Reminder: The CSU requires students to be fully vaccinated against COVID-19 by September 30, 2021, unless you have an approved exemption. Currently, Chico State is requiring everyone on campus to wear an approved face covering in all indoor campus spaces. Accordingly, all students are required to wear an appropriate face mask covering the nose and mouth in order to participate in this course. Policies and requirements regarding COVID-19 are subject to change pursuant to campus, local, state and/or federal guidelines. Please note that dishonesty relating to the vaccination policy and/or your failure to comply with any other COVID-19 related safety policy or mandate, including the face covering requirement, may result in disciplinary action against you through the office of Student Conduct, Rights and Responsibilities, which can include suspension or expulsion from the California State University system. Individuals unable to wear a face covering due to a medical condition should contact the Accessibility Resource Center by phone at (530) 898-5959 or by email at arcdept@csuchico.edu |

**University Policies and Campus Resources**

**Academic Integrity**
Students are expected to be familiar with the University’s Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found on the [Student Judicial Affairs web site](https://www.csuchico.edu/student-affairs/student-judicial-affairs/).

**IT Support Services (Optional)**
Computer labs for student use are located on the first and fourth floor of the Meriam Library, Room 116 and 450, Tehama Hall Room 131, and the Bell Memorial Union (BMU) basement. You can get help using your computer from IT Support Services; contact them through the [ITSS web site](https://www.csuchico.edu/services/its/home/). Additional labs may be available to students in your department or college.

**Student Services (Optional)**
Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found on the [current students page of the CSU Chico web site](https://www.csuchico.edu/current-students/).
Americans with Disabilities Act
If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
530-898-5959
Student Services Center 170
arcdept@csuchico.edu

Student Learning Center (Optional)
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The University Writing Center has been combined with the Student Learning Center. You can also visit the Student Learning Center web site.

Blackboard ALLY
Chico State is committed to providing you the best learning experience possible. With this goal we have activated Blackboard ALLY in your courses. ALLY is a revolutionary product that focuses on making digital course content more accessible to all students. You will now be able to download any content in this course in the format that fits best with your learning style. PDF, HTML, .EPUB and Audio files are now available for most content items. Here is a link to more information on formats available as well as what each format offers. Should you have any questions or experience issues while using ALLY please contact the Office of Accessible Technology and Services at oats@csuchico.edu or 530-898-6532.
Course Objectives: Students will learn to model, analyze, and design heat transfer systems, components and processes by applying the appropriate rate equations (for conduction, convection, and radiation) with the principle of energy conservation.

Specific Course Outcomes
1. Identify the important and/or possible heat transfer modes in any physical system.
2. Write surface and control volume energy balances with the appropriate heat transfer rate equations for any physical system.
3. Simplify the general heat conduction equation and write boundary conditions for any well-posed conduction heat transfer problem.
4. Represent any steady-state, 1-D conduction system as a thermal circuit and solve for unknown heat rates and/or temperatures.
5. Use the lumped capacitance method or appropriate analytical solution to solve transient conduction problems.
6. Calculate a convection heat transfer coefficient ($h$) from an appropriate empirical correlation and use it to determine a heat transfer for a variety of fluid flow configurations.
7. Design/specify a fin array or heat sink to meet a temperature or heat rate requirement.
8. Calculate pressure drop, fluid outlet temperatures, heat transfer rate, or required surface area for pipe flows and heat exchangers.
9. Determine view factors, compute radiation heat rates and/or temperatures in an $n$-sided enclosure with gray, diffuse surfaces.