MAE 322 – Thermal and Fluids Laboratory, Spring 2020
Mechanical and Aerospace Engineering Department, West Virginia University

Section 001:	Monday: 3:00 PM – 5:50 PM	Lecture: 207 ESB, Lab: B-05 ESB
Section 002:	Tuesday: 3:00 PM – 5:50 PM	Lecture: 801 ESB, Lab: B-05 ESB
Section 003:	Wednesday: 2:00 PM – 4:50 PM	Lecture: 211 ESB, Lab: B-05 ESB
Section 004:	Thursday: 12:20 PM – 2:50 PM	Lecture: 209 MRB, Lab: B-05 ESB
Section 005:	Friday: 2:00 PM – 4:50 PM	Lecture: 449 ESB, Lab: B-05 ESB

Instructor: Dr. Christopher Griffin, Teaching Assistant Professor, MAE Dept.
Office Hours: M, 2:00 – 3:00 PM; Th, 9:30 – 10:30 AM, or by appt. (open door policy)
Contact Info: Office – 939 ESB, Phone – 304.293.3386, Email – cgriffin@mail.wvu.edu

Lab Assistant: Mr. Hunter Dalton, Email – hcdalton@mix.wvu.edu, Office – 111 ERB

Course Description
The purpose of this course is to provide laboratory experience to the student in the areas of thermodynamics, fluid mechanics, and heat transfer. The laboratory exercises demonstrate many of the theories taught in lecture courses dealing with thermal and fluid sciences. In addition, the student will be introduced to a wide variety of hardware that is used to quantify thermal science and fluid mechanics behavior, such as flow rate measurements, pressure drop in pipes, the Bernoulli principle, heat transfer in heat exchangers, and thermodynamic processes.

Course Pre-requisite: MAE 320 (Thermodynamics)

Course Format
The course consists of a one-hour lecture per week and one laboratory session per week. The laboratory session will consist of a laboratory experiment or data reduction session from a previous laboratory experiment. The laboratory experiment will be performed in small groups (6-8 people) while data reduction will be performed by the entire class. Laboratory reports will be required for all experiments. The reports will be written in groups of three or four students and will be due two weeks after the experiment is performed. **LATE REPORTS WILL NOT BE ACCEPTED**. Also, three short quizzes will be given and scheduled in advance.

Grading
The final grade in the course will be assigned on the following basis:

6 Lab Reports	70%
3 Quizzes	20%
Peer Evaluations	10%

Final course grade will be submitted as: A (≥89.5%), B (≥79.5%), C (≥69.5%), D (≥59.5%), F (<59.5%)
Note: A final course score of 59.4% and below is a letter grade of "F," whether you are graduating or not — No EXCEPTIONS.

Key Course Objectives
The objectives of this course are to reinforce the theory and techniques about thermodynamic principles, including fluid flow and energy transfer measurements, develop skills to document experimental methods and data collection, and to learn to work cooperatively in a team environment.

Also, students will also be exposed to analog and digital experimental data collection hardware, including flow meters, thermocouples, and pressure gauges.

Key Course Learning Outcomes

Through satisfactory completion of classroom discussion, detailed laboratory reports, and quiz problems, successful students will be able to:	ABET Outcome*
1. Conduct experiments concerning thermal and fluid systems.	6
2. Collect, analyze, and disseminate findings regarding conducted experiments for a variety of audience types.	3, 6
3. Work cooperatively in a team setting.	3
4. Design experiments and data collection methods based on desired specifications.	6
5. Identify and calibrate appropriate measurement devices based on the properties to be measured.	6

***Prescribed ABET Course Outcomes for MAE 322**

ABET Outcome 3: Upon graduation, all Bachelor of Science Students in mechanical or aerospace engineering will have an ability to communicate effectively with a range of audiences.

ABET Outcome 6: Upon graduation, all Bachelor of Science Students in mechanical or aerospace engineering will have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Spring 2020 General Academic Calendar Key Dates

JAN 13	First Day of Classes	MAR 16 – 20	Spring Recess (No Classes)
JAN 17	Last Day to Modify Classes	APR 10	Spring Holiday (No Classes)
JAN 20	MLK, Jr. Recess (No Classes)	APR 17	Last Day to Drop or Withdraw
MAR 06	Mid-Semester Grades Due	MAY 01	Last Day of Classes

Attendance Policy/Laboratory Etiquette

Attendance will be taken during each lecture, lab session, and data reduction session. **All lecture, lab sessions, and data reduction sessions must be attended by the student** unless prior arrangements are made, consistent with WVU policies. In addition, professional conduct will be expected during lecture and laboratory exercises. Please turn off cell phones during lecture and laboratory exercises. Please do not engage in idle chat with friends during lecture and particularly during the laboratory experiments, it is distracting, and your attention is required not only to learn the principles but also to maintain a safe laboratory environment. When in the physical laboratory, you must abide by all laboratory rules.

Teaching Philosophy

- As the instructor, I will do everything possible to help you learn and understand the material, but you must do your part. The student is ultimately responsible for actually learning the material.
- In my course, a grade of "C" means that you have gained an average knowledge of the topic and have a grasp of only the basic concepts. It is not trivial to obtain an "A" in this course, but by the same token, it is also difficult to get an "F."
- If you have questions on the material, the experiments, how I grade, or life in general, come and see me. I am always open to answering your questions or meeting to discuss your concerns.

Academic Integrity

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy (http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter. In addition, the MAE Policy of Academic Integrity will be used to address instances of academic dishonesty according to the following table:

Statler College Policy of Academic Integrity
(Approved by the Statler College Academic Standards Committee, 28 March 2019)

Case	Violation	Penalty
1	Cheating or plagiarism on minor course element (e.g., quiz, weekly lab report, homework as specified in the syllabus)	Report of academic dishonesty Grade of zero on the entire minor course element Possible one-letter reduction in final grade
2	Cheating or plagiarism on a major course element (e.g., exam, project)	Report of academic dishonesty Grade of zero on the entire major course element Possible additional one-letter reduction in final grade Possible UF† recommendation Possible exclusion from further participation in class
3	Collusion on major course element	Report of academic dishonesty Exclusion from further participation in class Failure in the course Recommendation for UF†
4	Other (document alteration, tampering with records, etc.)	Report of academic dishonesty Grade of zero on the entire major course element Possible additional one-letter reduction in final grade Possible failure in the course Possible exclusion from further participation in class Possible UF† recommendation
* Dismissal from Statler College is permanent for Academic Integrity violations. Student conduct violations can be considered in dismissal. † UF - Unforgivable F Grade; cannot be replaced under D-F repeat policy. π Separable sanctions (e.g., dismissal from Statler College, suspension, or expulsion from WVU) will be recommended for aggravated or second AI offenses. § Warning letters may be issued from the Statler College or the WVU Office of Student Conduct.		
Sanctions will be assessed at the instructor and at the college/university levels. Additional sanctions may be assigned at the level of the instructor, college, and/or university.		
FORBIDDEN on Exams and Quizzes: The use of programmable calculators or smart devices (including smart-phones, smart watches, tablets, cameras, wearable devices, etc.) is prohibited unless specifically indicated by the instructor.		

Adverse Weather Statement
In the event of inclement or threatening weather, everyone should use his or her best judgment regarding travel to and from campus. Safety should be the main concern. If you cannot get to class because of adverse weather conditions, you should contact your instructor as soon as possible. Similarly, if your instructor(s) are unable to reach the class location, they will notify you of any cancellation or change as soon as possible, using WVU MIX email to prevent students from embarking on any unnecessary travel. If you cannot get to class because of weather conditions, instructors will make allowances relative to required attendance policies, as well as any scheduled tests, quizzes, or other assessments.

Inclusivity Statement
The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the Office of Accessibility Services. (https://accessibilityservices.wvu.edu/)

More information is available at the Division of Diversity, Equity, and Inclusion (https://diversity.wvu.edu/) as well.

Sexual Misconduct Statement
West Virginia University does not tolerate sexual misconduct, including harassment, stalking, sexual assault, sexual exploitation, or relationship violence [BOG Rule 1.6] (https://policies.wvu.edu/finalized-bog-rules/bog-governance-rule-1-6-rule). It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to a member of university administration, faculty, or staff; keep in mind that they have an obligation to report the incident to the Title IX Coordinator. (https://titleix.wvu.edu/staff)

If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the **Carruth Center, 304-293-9355** or **304-293-4431** (24-hour hotline), and locally within the community at the **Rape and Domestic Violence Information Center** (RDVIC), **304- 292-5100** or **304-292-4431** (24-hour hotline).

For more information, please consult WVU's Title IX Office (https://titleix.wvu.edu/confidential-resources).

Disclaimer
The instructor reserves the right to deviate from the syllabus when a change is in the best interests of the class, as determined by the instructor.