AGEN/BSEN 260: INSTRUMENTATION I

Bulletin Description: Instrumentation I for Agricultural and Biological Systems Engineering (AGEN/BSEN 260) (3 cr) Lec 2, Lab 2. Prereq: MATH221 or parallel.

Class Time/Place: Lecture: CHA 116, TR 1:00-1:50 PM

Lab (sections 151-4): Labs will be divided up between 2-3 rooms in Chase in order to meet spacing requirements. Do not worry about the section you signed up for; they are all treated the same.

Office Hours; how to find me or make an appointment: I am very happy to see you whenever you need help – please do come and see me. My schedule precludes set office hours, thus please use Student Success Hub to make an appointment.

Please do not misinterpret my inability to set fixed office hours as a signal that I do not want to see you – I do! I will make time to see you.

When emailing me: **Email me through Canvas** so I have a record of our conversation. My spam filter is very aggressive and rejects many non-UNL emails. I am not responsible for information or questions sent from non-Canvas emails.

Required Materials:

1. Open source textbook supplied by instructor; PDFs available in Canvas. Please see attributions and citations for each reading for more in-depth study. I am not jumping for joy about the textbook.
2. MATLAB version 2018a or later (free for all students, all computers, with My.UNL credentials – see https://itprocurement.unl.edu/matlab)
3. iClicker remote or equivalent app on your phone or computer.

Instructor: Dr. Greg Bashford
230 Chase Hall
Email: through Canvas only

Graduate T.A.s: Saida Mitu (email through Canvas)
Husein Harun (email through Canvas)

Undergrad T.A.s: Anna Levorson (email through Canvas)
Carley Conover (email through Canvas)
Savannah Walvoord (email through Canvas)
Terel Eisenbraun (email through Canvas)

Course Description: This course will provide an introduction to modern instrumentation concepts, including electrical circuit analysis. Concepts include electrical fundamentals, electrical safety, solving circuits with KVL and KCL, DC, transient, and AC circuits, impedance, resistive and reactive sensor properties, data acquisition to computers, and power. Laboratory exercises include modern examples of the in-class topics, including measurement tools.

Attendance: Attendance at all class meetings is required, expected, and part of your grade for the class. Consistently showing up late will also affect your grade. I will give announcements, homework assignments, etc. at the beginning of class; iClicker questions will occur then too. If you need to miss class, let me know ahead of time. Do not ask me for notes beyond what are posted on Canvas.

Class Procedures:

- Scheduled classes. Class begins *promptly* at 1:00 PM. Quizzes, announcements, and iClicker questions are given at the beginning of class.
- Announcements and assignments may be given by email or by Canvas – **you are responsible for checking Canvas regularly** and having a valid email address registered on Canvas.
- Homeworks are normally given at the end of class on Thursdays and are due the following Tuesday before class. Scan in all homeworks and submit to Canvas.

Course Objectives:

- Comprehend the fundamental concepts of charge, current, voltage, and power
- Apply the fundamental voltage and current laws to solve DC and AC circuits
- Learn to use modern DAQ equipment to save laboratory data on a computer
- Learn to use modern voltage and current measurements tools
- Prepare for advanced classes in instrumentation where synthesis is required

Grade Weighting: **PLEASE NOTE**: Your Canvas "grade", as seen on the Grades tab, ***will not reflect*** your final grade! Do not use the points given there to assume anything. Calculate your grade as given in the tables below. Ask me if you have any questions!

Homework (no late homeworks accepted)	25%
Tests (2)	25%
iClicker Questions	10%
Laboratory	20%
Final	15%
Professionalism Professionalism will be graded based upon the instructor's subjective discretion, and will include factors such as attendance, participation, and activities during class time (i.e. what you are doing during class).	5%

Final Grade Assignment:

Points (x)	Final Grade
$x \geq 90$	**A range (A-, A, A+)**
$80 \leq x < 90$	**B range (B-, B, B+)**
$70 \leq x < 80$	**C range (C-, C, C+)**
$60 \leq x < 70$	**D range (D-, D, D+)**
$x < 60$	**F**

Final Exam: Monday, May 15, 2023; 1:00 – 3:00 PM, Chase 116

Academic Dishonesty Statement "Students are expected to adhere to guidelines concerning academic dishonesty outlined in Section 4.2 of University's Student Code of Conduct which can be found at https://studentconduct.unl.edu/student-code-conduct. Students are encouraged to contact the instructor to seek clarification of these guidelines whenever they have questions and/or potential concerns."

Grade Appeal Instructions "A student wishing to appeal an AGEN, BSEN, ENSC, MSYM, CASNR or COE policy must first request a decision from his or her academic adviser. If a satisfactory solution is not achieved with the adviser, the student may request a decision from the BSE Department Exceptions Committee and then the Department Head (in that order). If a satisfactory solution is not achieved at the department level, the student may appeal his or her case through the appropriate College Dean's Office.

In the event of a dispute involving AGEN, BSEN, ENSC, or MSYM course grades, the student must first appeal to his or her instructor and, if resolution with the instructor is not achieved, then and only then, an appeal may be made to the Department Exceptions Committee. If the latter appeal fails, then an appeal to the Department Head in writing may be made. If a satisfactory solution is not achieved at the department level, the student may appeal his or her case through the appropriate appeal process of the cognizant College using that body's process.

Students appealing either a policy decision or course grade must do so within one semester following the decision or grade."

Services for Students with Disabilities Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Safety Information

- **Fire Alarm (or other evacuation):** In the event of a fire alarm: Gather belongings (Purse, keys, cellphone, N-Card, etc.) and use the nearest exit to leave the building. Do not use the elevators. After exiting notify emergency personnel of the location of persons unable to exit the building. Do not return to building unless told to do so by emergency personnel.
- **Tornado Warning:** When sirens sound, move to the lowest interior area of building or designated shelter**.** Stay away from windows and stay near an inside wall when possible.
- **Active Shooter**
  - **Run - If you know where the danger is and it is safe to go**
  - **Hide - If unsafe to escape, hide in a secure place**
  - **Fight - If hiding is not an option, fight as if your life depends on it.**
- Additional Safety Procedures can be found here: https://safety.unl.edu

Mental Health and Wellbeing Resources

UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological Services (CAPS) Counseling and Psychological Services | Nebraska (unl.edu) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450.

Big Red Resilience & Well-Being (BRRWB) Big Red Resilience & Well-being | Nebraska (unl.edu) provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it. BRRWB can be reached by calling 402-472-8770.