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**BSEN 311: BIOMEDICAL SIGNAL & SYSTEM ANALYSIS**

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**Bulletin Description:** Biomedical Signal & System Analysis (BSEN 311) (3 cr) Lec 3. Prereq: MATH221, CSCE155N or equivalent.

**Class Time/Place:** TR 9:30 AM – 10:45 PM, Chase 112

**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. Free textbook supplied by instructor; PDF available in Canvas.
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 phone or computer.

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

**T.A.s:** Evie Barrett (email through Canvas)  
Brenna Wright (email through Canvas)

**Course Description:** This course provides the foundation for basic signal and system analysis. Examples will draw from real-world biological/biomedical systems, and application will be emphasized over theory. Tools and concepts to be learned include signal representation, system classification, transfer functions, impulse response, convolution, Fourier analysis, and basic filtering.

**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 9:30 AM. 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.

**Course Objectives:**

- Learn the fundamentals of signals and systems
- Gain exposure to examples of real-world biological signals
- Practice manipulating and analyzing typical signals
- Prepare for advanced classes utilizing signal analysis tools
- Discover if your interests lie in the biomedical signals field

**Grade Weighting:**

**PLEASE NOTE:** Your Canvas “grade”, as seen on the Grades tab in Canvas, **does 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%
MATLAB Projects (3)	15%
iClicker Questions	10%
Demonstrations of Power (3)	30%
Final Demonstration of Power	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:**

Tuesday, May 16, 2023; 10:00 AM – 12:00 noon, Chase 112

**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**

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss your accommodations so they can be implemented in a timely manner. SSD contact information: 117 Louise Pound Hall.; 402-472-3787.

**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 \(unl.edu\)](https://www.unl.edu/caps) 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 \(unl.edu\)](https://www.unl.edu/brrwb) 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.