Course Catalog Description:

This course presents engineering techniques for the restoration and augmentation of human function via direct interactions between the nervous system and artificial devices, with particular emphasis on brain-computer interfaces. Novel interfaces, hardware and computational issues, and practical and ethical considerations will also be covered.

Prerequisites: Graduate standing or permission of instructor.

Credit Hours: 3.0

Class Times: Thursdays 4:20 – 7:00pm

Class Location: 222 Kaufman Hall

Required Textbook: None, all reference materials will be provided.

Course Materials and Announcements will be posted on Blackboard (https://blackboard.odu.edu)

INSTRUCTOR

Dean J. Krusienski, Ph.D.

Office: 234 Kaufman Hall

Office Hours: TBA (or by appointment)

Office Phone: 683-3752

Email: dkrusien@odu.edu

POLICIES & GRADING

Course Grade

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<table>
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<tbody>
<tr>
<td>Exam I</td>
<td>25%</td>
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<tr>
<td>Exam II</td>
<td>25%</td>
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<tr>
<td>Homework Assignments</td>
<td>20%</td>
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<tr>
<td>Project</td>
<td>30%</td>
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Students registered for BME 824 or ECE 895 will complete additional PhD-level requirements for the exams, assignments, and project; and will be evaluated at a higher standard compared to students registered for BME 724 and ECE 795.
TOPICS (Tentative)

1. Relevant Neurophysiology and Neuroscience
2. Signal Acquisition
   2.1 Sensors and Arrays
   2.2 Hardware
3. Signal Analysis
   3.1 Action Potentials
   3.2 Local Field Potentials
   3.3 Artifacts
4. Brain-Computer Interfaces
   4.1 Invasive
   4.2 Noninvasive
5. Neuroprosthetics
   5.1 Sensory
   5.2 Motor
   5.3 Cognitive
6. Practical and Ethical Considerations