

Wrapup

[00:00:00.90] This is the end of the neural engineering course. Congratulations, you made it to the end. But this time, you should be able to answer these core questions that I posed to you in the first lecture of the course. What is neural engineering? Why do we want to do neural engineering? Who benefits from this work? And what conditions might they have that would prompt them to seek neural engineering solutions?

[00:00:24.11] What do we need to know about the brain and body in order to do neural engineering right? The brain is a highly complex system and it's not an easy place to do engineering. And what can neural engineering do that can't be done with other forms of treatment? What would push someone toward seeking specifically a neural engineering solution?

[00:00:43.97] If you're still struggling to answer these questions, you might want to review these topics. General neuroanatomy and neurophysiology appeared in lectures 2 through 4, systems of the brain in 5 and 6, diseases and injuries of the nervous system, reasons a person might seek a neural engineering device in lecture 7. Principles of engineering and developing designs in lecture 8.

[00:01:06.62] Major types of neural engineering designs that currently exist on the market or in experimental forms in 9 and 10. Senses and sensory systems in 11 through 14. Motor control and systems in lectures 15 and 16. And of course, our four guest lectures who are addressing specific specialized topics in lectures A through D. And don't forget to complete all of the assignments and compare your work to the samples and keys.

[00:01:36.41] Finally, what does a career in neural engineering look like? This is me and my career. There are many different things that a neural engineering career can be, including fundamental scientific or engineering research, like what I do, which happens mostly at universities.

[00:01:51.65] Applied scientific or engineering research, such as at medical device companies. Engineering design and practice, such as designing medical devices or building prosthetics. Medical practice, including acute care after an injury or for a disease. Specialists with knowledge of different conditions and treatments, including neural engineering treatments.

[00:02:12.83] Rehabilitation providers, such as occupational therapists and physical therapists, who might use neural engineering tools in their work or prepare patients to use a neural engineering tool in their everyday life. And hospital or everyday nursing care, because neural engineering patients often have complex care needs.

[00:02:31.37] There are also patient advocates and educators, including formally in universities, for device users and those around them, and for the public, to understand the field. And why does it matter? Because neural engineering helps real people with real needs who can't currently find treatments in any other way.

[00:02:52.70] The understanding of the brain and the devices that we can create have the ability to give people independence, the ability to interact with their environment, and a choice that would not otherwise exist for the course of their care. Thank you for joining me through this course. And also thanks to the team, who supported the development. I couldn't have created the course without the support of these organizations and individuals.

[00:03:16.35] The University of Washington Center for Sensorimotor Neural Engineering, an NSF Engineering Research Center, supported the development and specifically, the recorded version of this class. The University of Washington Math Science Upward Bound program, supported by the Department of Education and Trio hosted the live versions of this class in the summer of 2016 and 2017 to support its development.

[00:03:40.63] And the principal contributors to the development of this course and getting it online for you to see it were, Dave Wolczyk from Math-Science Upward Bound, Eric Chudler from the Center for Sensorimotor Neural Engineering and Electrical Engineering at the University of Washington.

[00:03:53.77] And our guest instructors, David Bjanec, Electrical Engineering and the CSNE at UW. Tim Brown, Philosophy and the CSNE at UW. Jenny Cronin, Bioengineering and the CSNE at UW. And James Wu, Bioengineering and the CSNE at UW. And finally, the students of the two live versions of this course, whose feedback helped make the class that you see today.