# Certificate in Neural Engineering-Signals

The Certificate in Neural Engineering-Signals will enable students to gain both fundamental and applied understanding of brain signals, a rapidly growing component of neural big-data research. The program includes the study of basic concepts related to brain waves, recording techniques and to types of noise. The student will also gain expertise in the usage of signal processing concepts in applications ranging from detecting the onset of epilepsy in LFP and EEG signals to the design of brain machine interfaces.

## Requirements

A total of 12 credit hours are required to obtain the certificate. At least one course must be neuro-related.

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| **Core Courses (at least 6 credit hours)** | | |
| ECE 2100 | Circuit Theory I | 4 |
| or ECE 3830 | Signals and Linear Systems | |
| BIOL_EN 4540 | Neural Models and Machine Learning | 3 |
| or BME 4540 | Neural Models and Machine Learning | |
| ECE 4830 | Introduction to Digital Signal Processing | 3-4 |
| **Support Courses (at least 6 credit hours)** | | |
| Any of the three courses listed above not taken | | |
| ECE 2001 | Experimental Course | 1 |
| ECE 2017 | World of Neuroscience | 1 |
| or CMP_SC 2017 | World of Neuroscience | |
| PSYCH 2210 | Mind, Brain, and Behavior | 3 |
| MPP 3202 | Elements of Physiology | 5 |
| ECE 4310 | Feedback Control Systems | 3 |
| or BIOL_EN 4310 | Feedback Control Systems | |
| or MAE 4750 | Classical Control | |
| BIOL_EN 4075 | Brain Signals and Brain Machine Interfaces | 3 |
| BIOL_EN 4070 | Bioelectricity | 3 |