



# The COLLEGE TODAY

## College Offers Concentration in Growing Field of Computational Neuroscience

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By: [cofc\\_webmaster](#)



Computational neuroscience is at the crossroads between physics, mathematics, computer science, biology, and psychology. It is a growing field and the newest concentration offered by the College of Charleston **Department of Physics and Astronomy**. It is also one of just a few undergraduate neuroscience programs in the country.

"With this concentration, students will be prepared to go into any lab that works with neural-related data," explains **Sorinel Oprisan**, physics professor. "On the clinical side (in a hospital) our graduates can assist with data collection, storage, compressing, computer server management and more. On the science side (in a research lab), our students can design computer codes to extract information from EEGs and compute the type of electrical currents for deep brain simulations treatment."

While the field has been in existence since the mid-1980s, it is recently gaining popularity, as the **Organization for Computation Neuroscience (OCNS)** reports their membership has doubled in the past two years.

All neuroscience research labs monitor and collect signals - everything from low-dimensional data, such as blood pressure, heart rate, oxygen level, EEG, electrocardiogram (ECG), etc., to more complex data such as PET scan, computer tomography images, MRI, functional MRI, etc. All these signals and images must be stored, processed, and analyzed by people trained in signal analysis (computer science, mathematics, physics) and who also have an understanding of basic biology/physiology.

Students who pursue a concentration in computational neuroscience will receive in-depth training on biophysical modeling of excitable cells, data acquisition, analysis, and interpretation tailored to biosignals. Their electives must include one course in biology/psychology/neuroscience and two courses in mathematics/computer science.

Undergraduate research in computational neuroscience is already underway at the College. Students are analyzing data collected at MUSC to determine the difference between regular and cocaine-addicted brain waves.

"These students could easily be accepted to a Ph.D. program and continue this type of research," Oprisan says. "Some of my former computational neuroscience students are now in Ph.D. programs at MUSC and Syracuse University among others."

For more information, contact Sorinel Oprisan at [oprisans@cofc.edu](mailto:oprisans@cofc.edu).

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