Unlocking the brain’s secrets requires harnessing cross-disciplinary knowledge: Mathematics, chemistry, genetics, cell biology, and studies of behavior, cognition, and language are some of the areas contributing to progress in neuroscience. Now, Northwestern undergraduate students have a robust, integrated major that lets them explore the brain in both depth and breadth.

This fall the Department of Neurobiology launched an interdisciplinary neuroscience major.

The major offers a comprehensive program that provides a thorough neuroscience foundation, with core and elective courses that address molecular, cellular, and systems-level mechanisms of brain function as well as the human brain and behavior. In these courses students learn not just the science but also the history, major ideas, and research approaches of neuroscience. They can also study the ethical implications of neuroscience research and its social impact. The curriculum prepares students for careers across a wide spectrum of areas, including research, medicine, biotechnology, pharmaceuticals, and even science journalism and patent law.

Because some neuroscience students are oriented toward quantitative sciences while others lean toward behavioral and cognitive areas, the neuroscience major allows students to choose an allied field, such as biology, chemistry, computation and systems modeling, human behavior and cognition, or language and human communication. The program is further strengthened with courses in related sciences (e.g., math, chemistry, physics, physiology) and laboratory experience.

“Developing a neuroscience major had been under discussion among Department of Neurobiology faculty for some time,” says Catherine Woolley, William Deering Chair in Biological Sciences. The faculty took action after conversations with a large number of interested students who voiced both their aspirations and challenges.

A significant burden was that students needed a double major to gain broad exposure to neuroscience. Northwestern has as many as four majors that offer brain-based study — biological sciences with a neurobiology concentration, psychology, cognitive science, and communication sciences — but none offer the full range of coursework that many students wanted. In some majors, students also had to wait until their junior or senior year before taking brain-related courses, “which is very late to study what you are most interested in,” says Woolley.

Junior Nicholas Hug and senior Helen Chen, each planning to pursue medicine, had designed what Chen calls a “pseudo-neuroscience major.” Hers was in biology and cognitive science while Hug combined biology with communication sciences and disorders. Both transferred to the neuroscience major this year.

In addition to integrating brain-related coursework, the major offers new neuroscience classes developed specifically for the major, notes Hug. Chen began working with Woolley to gather peer feedback. She says she wanted to play a role in developing the new major so that future students could enjoy all the opportunities it provides.

Students aren’t the only beneficiaries of the major. Northwestern neuroscientists have appointments in at least 10 departments, including physics and linguistics. Woolley hopes that working together on the undergraduate curriculum will provide colleagues with more interdisciplinary engagement, further promoting collaboration in research and teaching.

—Maureen Searcy