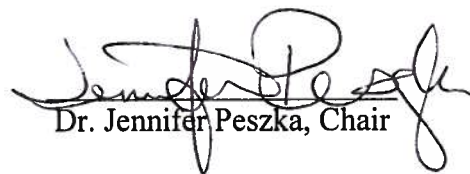


Colin Hoy

Interdisciplinary Program: Neuroscience

Hendrix College



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## Neuroscience

Neuroscience is by definition an interdisciplinary field drawing from biology, chemistry, psychology, and philosophy. The overarching theme of the major will be to combine these fields to yield an understanding of the interaction between the biochemical mechanisms of the central nervous system and an organism's behavior. This interdisciplinary major will give me the background needed in all of these areas to sufficiently prepare for graduate studies in a subfield of neuroscience. I propose to follow the major and tracks set forth by the Neuroscience working group. The proposal includes 1) a core of classes that all neuroscience majors must complete, 2) one of two elective tracks in either behavioral or molecular neuroscience, 3) an independent research project, and 4) a senior capstone experience.

1) The Core: All students completing the neuroscience major would be required to complete the following core courses:

- 1) BIOL 150: Cell Biology
- 2) BIOL 250: Genetics
- 3) BIOL 325: Cellular and Molecular Neuroscience
- 4) CHEM 110: General Chemistry I
- 5) CHEM 120: General Chemistry II
- 6) PSYC 290: Statistics
- 7) PSYC 360: Behavioral Neuroscience
- 8) PHIL 350: Philosophy of Science
- 9) PHIL 480: Philosophy of Mind

2) Elective Track: Molecular Track: Students completing the molecular track of the neuroscience major would be required to complete the following 3 courses in addition to the core courses above:

- 1) CHEM 240: Organic Chemistry I
- 2) CHEM 250: Organic Chemistry II
- 3) CHEM 330: Biochemistry

3) Research: All students completing the neuroscience major would be required to complete a research project that consists of

1) Two semesters of research at Hendrix

OR

2) One summer (minimum of 8-weeks at 40 hours/week) of research at Hendrix or another pre-approved summer research program.

4) Senior Capstone: All students completing the neuroscience major would be required to complete a senior capstone experience consisting of the following:

1) Preparation of a literature review of a topic of interest in neuroscience submitted to and graded by the students' advisor.

2) An oral presentation of the literature review to the major committee.

Having already completed the Molecular track and most of the core courses, I will attempt to take as many courses pertaining to behavioral neuroscience as possible. This major will provide the most accurate reflection of my career goals and my extensive knowledge of biology, chemistry, and philosophy. It will allow me to focus on the courses that are truly necessary for me to understand the central nervous system and its role in human cognition and consciousness, while avoiding taking courses simply to fill the requirements of a major that doesn't encompass my interests.

My goal is to work towards a unified theory of the workings of the brain, and based on the current knowledge of the brain's neural networks and their interactions and functions, this goal is a long way away. Jeff Hawkins has attempted to compile such a theory in "On Intelligence," but he points out that everyday more data about the brain piles up with few people trying to synthesize this information into a cohesive theory. Still I am intrigued by the ability of a few

pounds of neurons linked together in a human skull to be the source of creativity, abstract thought, and the central tenets of what we consider humanity, and this curiosity drives me to continue learning about the brain.

After graduating with a comprehensive background in neuroscience, I intend to pursue multiple graduate degrees in neuroscience. This may begin with entering a master's program in neuroscience to gain a broader perspective on the available subfields of neuroscience. This interdisciplinary major and master's program will allow me to apply to select graduate programs that are better tailored to my specific interests. I plan to apply to several M.D./Ph.D. programs to then specialize and gain the skills necessary for a career in neuroscience research. I hope to conduct translational research in the spirit of "bench top to bedside" research. This will allow me to gain further insight into the complex functions of the brain while helping society develop relevant therapies for patients suffering from brain disorders.