Bernard Smith
Class of 2015
Interdisciplinary Major Proposal
Applied Mathematics

Hendrix College has provided a wonderful education for me, allowing myself to enjoy the riches of the liberal arts while also concentrating on a special area of interest. I have found my place in the mathematics department, and I have seen myself grow from this. One thing I especially admire about Hendrix is its emphasis on growth, both personally and intellectually, and its allowance to each student to find his unique path in learning. In saying this, the mathematics department has helped me to realize the distinction between pure mathematics, focusing on the abstract concepts and theories behind the numbers, and applied mathematics, focusing on connecting numbers to real-world situations. Hendrix has given me the opportunity to explore both of these concentrations, allowing me to see the importance of both sides while acknowledging the differences that each presents. After careful consideration, I believe that a degree in pure mathematics is not the best fit for me. Because of this, I am proposing an interdisciplinary major in Applied Mathematics. As an aspiring teacher, I want to focus on real-world concepts in my own classroom and developing a major that adheres more cohesively to these ideas will help me to better portray these skills and concepts more clearly to these students, especially those who are constantly asking how these concepts will matter in their own lives. In addition, in my more advanced theory classes, I find myself interested in the material but I notice that I am more geared towards using numbers in concrete situations. A major in applied mathematics will allow me to explore that part of myself more deeply while preparing for a career that focuses on the important question, "Where do I use this?" rather than the equally important query, "Why do I use this?"

In this proposed Applied Mathematics major, there is actually very little change from the Pure Mathematics major offered by Hendrix. The major will include the following classes:

- MATH 130 Calculus I
- MATH 140 Calculus II
- MATH 230 Multivariable Calculus
- PHYS 230 General Physics I (Calculus-based)
- MATH 260 Differential Equations
- MATH 270 Linear Algebra
- MATH 310 Probability and Statistics
- MATH 340 Combinatorics
- MATH 490 Game Theory
- A two-course sequence at UCA:

        - MATH 4305 Ordinary Differential Equations II (formerly Applied Mathematics I)
        - MATH 4306 Modeling and Simulation (formerly Applied Mathematics II)
- Capstone Experience:
        - MATH 497 Senior Seminar

With this curriculum, I fulfill all requirements for a mathematics major as designated by Hendrix except the 2-course track MATH 320/350 Abstract Algebra/Real Analysis and MATH 420/450 Seminar in Algebra/Seminar in Analysis. My plan is to replace this required track with MATH 4305 Ordinary Differential Equations II and MATH 4306 Modeling and Simulation, offered at UCA. This will provide me with the depth of an advanced math curriculum with higher level courses that focus specifically on applied mathematics, a track that Hendrix unfortunately cannot offer at this time. The Capstone Experience will follow along the same timeline and structure as those pursuing a traditional mathematics major, focusing on the applications of concepts or researching techniques to apply math to the real world.

With this major, I feel that I would graduate more comfortable in my major and better prepared for my career. With the introduction of pure mathematics that is provided in this major, I can dive deeper into certain concepts with high school students who are prepared for that knowledge. More importantly, with a degree in applied mathematics, I can more clearly show all the students in my classroom the importance and significance that mathematics has on the world.

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Dr. Duff Campbell, Mathematics, Committee Chair

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Dr. David Sutherland, Mathematics