When Dr. Cavagnaro came to me with the idea for this internship, I jumped at the opportunity. I am a mathematics major and education minor, and my ultimate goal is to be a college professor. I knew that by assisting her in research and the 'revamping' of her cryptology course curriculum I would get a glimpse at the responsibilities of a professor.

The only way to sufficiently describe this internship would be to use the phrase 'course revamping.' Dr. Cavagnaro has been teaching this course for many years, and believes the available texts to be incomplete, with some useful information in one textbook and more in another. This is no way to teach a class, and as a result she has begun the project of developing her own textbook. Dr. Cavagnaro asked me to assist her in this task, and I agreed willingly. As a mathematics major I was able to bring fresh insight into her Cryptology course curriculum. In addition, I'm minoring in education and I attempted to bring what I have learned in my education courses into the internship. I learned a great deal about mathematics, specifically modular arithmetic, the Fundamental Theorem of Arithmetic, the Division Algorithm, and more. In addition, I learned extremely interesting information regarding the development of cryptology across the world and throughout history.

My work began over the summer as I read the CodeBook by Author, before arriving at Sewanee to begin the actual internship. My first responsibility was to write and compile a bank of questions based on the CodeBook. Dr. Cavagnaro has been using the same multiple-choice and true/false questions for her class over the past few years and realized she needed a new eye to create questions from the book. Each chapter in the book has multiple sections, and it was my job to write multiple-choice questions from each section of every chapter. This bank of questions will be available to Dr. Cavagnaro to use in daily quizzes and tests, to make sure her students are keeping up with the reading.

The main project that I overtook these past few weeks was developing a collection of math problems including their solutions for each mathematical section of the class. Dr. Cavagnaro begins with 1.1, an understanding of division, and continues with 1.2, and 1.3 etc. until she reaches 4.1, a study of RSA, a specific encryption algorithm. Each section builds off of the first and relates to the way messages are encrypted in various methods of cryptology. My job was to begin with 1.1 and write examples that support its Theorems, and then write exercises for the students to complete in class, homework problems, and also quiz and test questions. I would do this for each section. Each example, exercise, homework problem and test question also had the full solution along with it. One of the most important things I learned in this internship is how to create, write and solve a difficult math problem. All of my years at Sewanee and in high school, I spent on the student side of this process, and for the first time I now know what it is like from the teacher aspect.

Additionally, I developed the skills necessary to transfer all of these written math problems into databases and electronic programs so that they can be used. I learned the language of LaTex, a program commonly used by math departments to write out quizzes and worksheets. Dr. Cavagnaro also uses the LaTex program to write out daily quizzes for her classes, which I also did some of. I also compiled the bank of CodeBook questions in a LaTex format so that Dr. Cavagnaro can retrieve any of the questions she needs at any time. The programming language was difficult to learn, but it is important because I will use it in my future in mathematics.

The second program that I used for Dr. Cavagnaro was WebWork, an online homework database. Students in her class are able to log into WebWork with their student IDs and do the homework online. The advantage of WebWork is that the homework is immediately graded. The difficulty lies in writing the program ahead of time, and being sure the homework and correct answers line up, error free. Dr. Cavagnaro does not want a student to attempt the homework

online at night, and have it fail to work. So we worked together to perfect the WebWorks and make sure they functioned properly. The language of WebWork is more difficult than LaTex, but they were similar, and that helped me grasp the idea of it.

Through all of my projects my main goal was to assist Dr. Cavagnaro in her own goal of developing a strong compilation of related textual information and questions that will enhance and 'revamp' her Cryptology course curriculum. I wrote the examples, exercises and subsequent homework and quiz questions so that they correlated throughout the chapters. The students will be able to see obvious progression in the math they are learning. In addition, the math directly relates to the factual cryptology information related to every chapter. I hope that I made a difference in Dr. Cavagnaro's life by making it easier, and in her students' lives by helping them reach a higher understanding of the subject.

My goal in life is to become a college mathematics professor, and I learned from this internship many of the inner-workings of that profession. Being on the other side of math problems opened my eyes to what math teachers go through, and I appreciate their efforts so much more. The high points of this internship were all of the "ohh!" moments when I would finally understand a difficult mathematical theorem and then be able to move forward with developing examples and questions about it. Dr. Cavagnaro was an incredible advisor and always willing to work with me on the new material. If I was confused, she was able to explain the theorem in a different way. She provided multiple texts books that made the material much clearer as well. Her flexibility allowed a stress-free environment, and we were able to create and build a better class curriculum as a result.

The low points of this internship were few if any. I would not consider any part of it a low point, however I did struggle through difficult theorems before the "ohh!" moments. In order to reach clarity, you must first not understand. This may seem obvious, but so many people in the

world give up when they do not understand something and discontinue their efforts. With Dr. Cavagnaro I learned how to battle through misunderstandings and frustration and come out on the other end having mastered a whole new aspect of mathematics. In the end, the low points turned into learning experiences.

This internship affected my career goals by enhancing them: being behind the scenes of a college level math class only made me want to attend graduate school more. I talked a lot with Dr. Cavagnaro and other professors in the department about graduate school, and they were extremely encouraging. This internship was an incredible opportunity and learning experience, and I am so grateful to have done it. Teaching at a liberal arts school such as Sewanee would be even more invigorating because you are required to continue your education, which is what I want to do. I never want to stop doing research, and this type of environment is very conducive to that. To future interns, never give up. You will come upon situations in any internship that seem to be a brick wall, but there is nothing that you and your advisor cannot tackle together. Your advisor is there to guide you in your research and responsibilities, so never fail to take advantage of what professors have to offer.