



DOUBLE MAJOR I.S. AGREEMENT

Name: Dylan Orris Student ID: 4101140847

Class Year: 2019 Campus Box: 2321 Cell/Room Phone: 269-753-9204

Department/Program Computer Science Department/Program Mathematics

Concentration (if Applicable): _____ Concentration (if applicable): _____

The Independent Study Project of a double major should be formulated to reflect an interdisciplinary/ multidisciplinary approach in a manner that represents four years of disciplinary engagement in each department/program. You and your advisers should have a joint meeting to establish the process for your Senior Independent Study. Complete the following agreement after discussion with your advisers. Please submit the agreement as soon as possible but no later than the end of Week 4 of the semester in which you undertake 45100. Advisers should sign the document indicating their approval only after the questions below have been answered.

- I. Outline the agreed-upon guidelines for weekly meetings, research and writing schedule, and any expectations for oral presentations of your work.

I will meet with Dr. Fox, my advisor for both majors, each week on Tuesday at 10 AM during the fall semester, and then at a to-be-determined weekly time during the spring semester. The year will progress largely according to the computer science guidelines, with bits added from the math guidelines where they are absent from computer science. The first few weeks will consist of preliminary coding and gathering of resources. In Week 6, I will give a five-minute oral presentation of my topic to the other computer science seniors. Around that time, I will have a tentative outline of my thesis, and an annotated bibliography. Approximately 70% of the software and 40% of the written thesis will be completed by the end of fall classes. During the last week of classes, I will give a 5-minute oral presentation of my topic to the other math seniors. In the spring, I will finish writing the thesis and software, create a poster for the I.S. Symposium, and give an oral defense to my advisor and a second reader from one of the disciplines.

- II. Provide a concise project description that includes potential research questions and the mutually agreed upon format.

This project seeks to create a Natural Language Processor, which will interpret an input mathematical claim. From this interpretation, the program will automatically prove or disprove the claim based on its knowledge of mathematical axioms. The deliverables from this project will match the computer science requirements, which are stronger than the math requirements. The final thesis will be a document of at least fifty pages in the standard format. Citations will be in the ACM format. The project will include a substantial piece of software, written in Perl and Prolog, using good coding practices and a version control repository. As per the computer science department's requirements, I will deliver a USB drive to my advisor by Symposium day that contains the final version of my software and the abstract of my thesis. Finally, I will create and present a poster at the I.S. Symposium.

- III. Explain how this is an interdisciplinary/multidisciplinary project? How do the knowledge and understanding you have gained from your respective majors contribute to your research?

This project is rooted in mathematical understanding of language in its first aspect, and knowledge of proofs and proofing techniques in the latter. Effective coding solutions will be required to create a software which runs quickly while properly understanding input and producing a coherent output.

Knowledge from mathematics courses have given the foundation of the mathematical weighting of the language and proof techniques, along with understanding logical progression of proofs. Computer science has taught proper coding techniques for clarity and efficiency, as well as background on Context Free Grammars, an important part of understanding language.



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IV. What are the criteria your advisers have agreed upon for the satisfactory completion of 45100?

Week 4 – Project Proposal (one-page description of the project's content)

Week 6 – CS Oral Presentation

By Week 7 – Preliminary Outline and agreement of chapters and software components to complete in the fall

By Week 7 – Annotated Bibliography

Week 12 – Math Oral Presentation

Week 12 – Agreed-upon chapters completed, a comprehensive narrative. Should be a substantial written portion of the thesis; at least 20 pages.

Week 12 – Agreed-upon software components completed. Should be approximately 70% of the entire software.

One of the Preliminary Outline or Annotated Bibliography must be completed before Fall Break; the other is due the week after Fall Break.

Grading:

Project Proposal: 12 points

Thesis Outline: 12 points

Annotated Bibliography: 12 points

Comprehensive Narrative: 20 points

Preliminary Software: 20 points

Math Oral Presentation: 10 points

CS Oral Presentation: 5 points

Attendance at Weekly Meetings: 17 points

If I receive at least 80 of these 100 points while completing all submissions in a timely manner, I will receive an S in 451. Otherwise, I will receive an NC.

V. What will be the criteria for the evaluation of your completed Independent Study project (45200)?

Week 1 – Another chapter completed, and a nearly final table of contents

Penultimate Meeting before Spring Break – First complete draft of thesis

Last Meeting before Spring Break – Completed software

March 25, 2019 – Final thesis due by 5:00 pm

Early April 2019 – Oral presentation

April 26, 2019 – I.S. Symposium Poster

The spring semester grade (H, G, S, NC) will largely represent an evaluation of the content and form of the final thesis, quality of the final software, oral presentation, and organization and methodology of project effort. More specifics are given in parallel in both the math and computer science guidelines.

VI. Student Signature: _____ Printed Name: _____

Adviser Signature: _____ Printed Name: _____

Adviser Signature: _____ Printed Name: _____

**PLEASE RETURN THE COMPLETED AGREEMENT TO
THE OFFICE OF THE DEAN FOR CURRICULUM AND ACADEMIC ENGAGEMENT.**

RECEIVED:

Office of the Dean for Curriculum and Academic Engagement

Date: _____