Example 1:

*Proposal for Pre-Candidacy Research*

*GEOG898*

*Advisor: \*\*\*\**

*Credits: 3*

*The field of ecological research is at a crossroads. Once the domain of biologists and social scientists, ecology now draws investigators from physics, remote sensing, and computer modeling to better understand how ecosystems change over time. Today, carbon modeling is one of the most pressing research areas, as anthropogenic increases in atmospheric carbon threaten to push ecological systems to (and past) their breaking points, disturbing homeostasis and driving global ecological change.*

*For this 3-credit pre-candidacy research I will be working closely with Dr. \*\*\* as I learn the fundamentals of global carbon and ecosystem modeling, and investigate particular research topics in pursuit of a suitable area for my dissertation. Dr. \*\*\* and I will meet biweekly to coordinate readings, assignments, and goalsetting for my career here as a doctoral student/candidate.*

***Research Materials*** *will include the following:*

* *Dr. \*\*\*’s modules used to introduce students to the ED model and associated info.*
* *Important papers in the Carbon Science literature, per Dr. \*\*\*.*
* *Particular tools/models/algorithms used within the ED lab.*

***Deliverables*** *for this study will include a final report, outlining the following materials:*

* *Output examples from the ED model and/or other pertinent modeling tools.*
* *Annotated computer scripts used to automate I/O for ED and/or other models.*
* *A summary of literature related to this research. An annotated bibliography or annotated Zotero collection may be considered as deliverable.*
* *Discussion of Dissertation motivation and outline of main science question, also to be used for PAC portfolio.*

*Upon completion of this course I will have an improved understanding of global climate and ecological models, their theory and functionality, as well as a stated area of interest for my dissertation. I arranged a similar independent study for the first quarter of my M.S. degree, and this proved to be incredibly motivating and productive.*

Example 2:

*The purpose of taking these credits is to continue work on my dissertation and to complete my proposal (with a plan to defend at the end of the semester!)*

***Overview of my work is as follows:***

*Beyond the proximate threats of urban development and land use, climate change will affect nearly every aspect of natural resource management, land use planning, and future development in the long term management of the District of Columbia.  Such effects will likely be changes in forest cover, sea level rise, and massive changes in infrastructure needs.  The District’s climate change adaptation plan and Sustainable DC Plan call for actions that provide access to green spaces; preserve natural systems, wildlife, and landscapes; ensure the resilience of natural and human systems; and encourage District residents to value the benefits of a healthy relationship with natural resources and the environment.  As such, understanding where such green space and land conservation would most greatly benefit species of greatest conservation need (SGCN) and increase the connectivity of natural land cover in the District is vital.*

*Therefore, using a geographical information system, I plan to integrate a basic dissimilarity model, which includes land cover percentages, road density, and spatial landscape metrics, as a resistant map in corridor identification analysis.*

*These corridor identifications will then be overlaid with the current public green space in the District of Columbia to identify other potential natural space along with the path of least resistance to existing spaces. I plan to concentrate the analysis on areas that had been determined potentially vulnerable to climate change in the Climate Change Vulnerability Assessment of the 2015 State Wildlife Action Plan.*

Example 3:

*GEOG 898 Pre-candidacy research: Proposal*

***\*\*\*\*\* (2018 Spring)***

*A:* ***Purpose and Objectives****: In this semester, in the GEOG 898 Pre-candidacy research course, I need to complete two ongoing projects. The treemapping project is to segment single trees from airborne Lidar point cloud data. The tree reconstruction project is based on the successful segmentation results from the Treemapping project to reconstruct solid representations of each individual trees for retrieving geometrical and biophysical characteristics of trees. This information is critical in many researches like above-ground biomass estimation. Both projects are to use computational geometrical methods, specific for point cloud data, to solve real problems in the remote sensing. I further hope to make applications in geographical research.  They are in my research interests and relevant to my graduate studies.*

***B: Procedures:*** *In order to finish the current two projects, I need to finish the algorithm/software development. But to improve the porotypes which I have built now, more literature reviews on related researches are required. And it is beneficial for me to attend talks or meetings to share the ideas and have discussions with other researchers in hope for any pragmatic comments. Because English is not my first language, it is also helpful for me to join some academic English writing workshops or ask other experienced authors to improve my English writing abilities.*

*C:* ***Outcomes:*** *During this semester, I should finish the Treemapping project and the Tree reconstruction project. The related algorithms will be well developed for research questions. Two reports or papers are needed too. It is desirable to include clear definitions of research problems with enough background for better understanding as well as illustrative work-flows with detailed explanations on each step, like used concepts, applied techniques, etc. The results, discussions and future works on the research project shall be covered in the articles too.*