Guidelines for Graduate Culminating Projects in Information Networking and Telecommunications

The culminating projects for students in the Masters of Liberal Studies in Information Networking and Telecommunications vary considerably based upon a student’s interests and career aspirations. The purpose of the culminating project is to draw from the knowledge and skills that a student has developed during graduate study and to apply those in a manner that demonstrates mastery. In almost all cases, a student will develop a review of the literature on the selected topic. From that point, the student may choose to conduct original research or to apply skills and knowledge to a skills based project.

Graduate Culminating Projects may be three or six credit hours in length. Generally, a student will not enroll to do a culminating project until he or she is in the final semester of other courses. Often the culminating project will take place after other coursework has been completed. Students will enroll in IDS 820 Projects in Liberal Studies or INT 876 Professional Topics in INT as agreed to with his or her advisor. A limited number of courses have cumulative projects that are substantial enough that they can act as the culminating project. One of these courses is INT 798 Advanced Internetworking Trouble Shooting. Other courses may be approved by the full INT Department Faculty.

Original Research

The purpose of original research is to create new knowledge. This type of project fits the traditional sense of graduate education and may fit into thesis guidelines. Even within this division, there are multiple options.

Projects may include social science or business research methods. Original research may be conducted via surveys, case studies, structured interviews, focus groups, or statistical analysis of technical, business or economic data. A broad listing of sample projects include examining learning effectiveness of methods of distance learning delivery, small business adoption of e-business applications, use of electronic systems in governmental organizations, information flow and dissemination in an organization, communication patterns using email in an organization or consumer evaluations of web site structures.

A student may be interested in a project that focuses on legal or policy implications in a relevant area and use legal research methods examining statutes, case law, and legal treatises. Examples of this would be a project researching the evolving legal status of electronic signatures, legal requirements for ADA accessibility of websites, or employee expectations of privacy of workplace email.

A student may conduct technical research related to networking, telecommunications, the web, or media. A study may focus on performance capabilities of competing equipment or technical standards, interoperability of equipment or software, effectiveness of firewalls or security tools.
Students interested in pursuing a doctorate degree will do original research. Such students typically will want to do a thesis and should follow the thesis guidelines established by the Fort Hays State University Graduate School.

Projects

A student may select performance based projects that demonstrate mastery that is on or above the par with the graduate level courses he or she has taken. The complexity expected will reflect graduate level work. **Projects will require a project proposal that includes a literature review and a plan of action before a student begins the actual work.** These projects may be developed for a person’s place of employment, a client, a non-profit organization, or a fictional simulation. Examples of these types of projects include designing a network, developing a transactional web site, or developing a significant lab exercise or series of exercises for undergraduate or high school students.

Proposal

Before a student begins the culminating project, he or she must have an approved culminating project proposal. It is wise for a student to discuss potential projects with his or her advisor and other faculty before embarking on creating a formal proposal. Use the INT Faculty, other FHSU Faculty, and professional contacts and colleagues for ideas and as consultants for your culminating project.

You will present the proposal to your committee and will be questioned on it. You will also present the completed project. These interactions can serve as part of your comprehensive examination and can shorten the exam you must take. You will be responsible for scheduling your committee. If you are an on-campus student, you will probably give your presentation face-to-face. In that case, schedule 30 minutes for the proposal. If you are a Virtual College student, you are encouraged to be creative and to maximize use of the technology. Presentations can be done through email with a mixture of PowerPoint and a text document, voice over PowerPoint, streaming video, interactive video and/or conference call. If you would like to come to campus, that is also encouraged.

**Original Research Proposal**

Title Page
Abstract
   This is a 200 word or less summary of the proposal.
Table of Contents
Introduction of the Topic and Justification
   This section explains what your topic is and why it is worth your time and efforts to research it. Support from primary sources is important.

Review of Literature
This chapter will typically include two parts: A. Discussion of Existing Research (with appropriate sections and subsections) and B. Research Questions.

The Discussion of Existing Research section is frequently referred to as the “literature review” in academic parlance. Its purpose is to review the relevant prior research in the field. This research provides evidence that you are knowledgeable about the area of study and that your work builds upon the work of prior scholars.

Remember, the literature reviewed will generally rely upon primary research sources. For example, if you are studying the impact of the Internet on primary educational learning, you will typically seek studies related to this topic that have been published in academic journals. You may find published studies examining technology applications and resulting student performance. With a topic that is this important, there are probably periodic “meta” studies that summarize dozens or even hundreds of studies.

If you are studying rural business use of e-commerce, you will typically seek studies of e-commerce generally and may or may not find much previous research on rural e-commerce. You may find United States Department of Agriculture and Federal Reserve Board secondary materials projecting the future importance of e-commerce to rural communities. Highly reputable secondary research from select sources is acceptable as a resource, but the majority of your research should use primary sources.

If you are studying the United States Supreme Court case striking down Congress’s attempt to require public libraries to use content filters, you will likely refer to court cases, statutes, and briefs of the parties as primary references. Secondary sources can be used. However, these should supplement primary sources. Commentaries, law review articles, editorials, scholarly books, and treatises are examples of valuable secondary sources.

The Review of the Literature should be “exhaustive.” If relevant research or cases have been published in this area, you will have reviewed and cited to them. Failure to cite to key sources can lead to rejection of your proposal or project. Typically forty or more sources will be used. However, there are subjects in the world of Information Networking where that are so new that only a handful of studies have been conducted – if so, communicate the limitations of resources to the reader.

Research Question - Your research question or questions propose the specific issue that you plan to research. The Review of the Literature should lead logically to this point. Most research questions extend the existing research reported in the academic literature. They seek to create new knowledge in researching areas that have yet been researched. Some Research Questions may replicate a previous study to test it or to apply it in a different context.

References
- Use a standard format such as APA, MLA, Chicago Orangebook, or Harvard Bluebook consistently throughout your proposal.

Methodology
What research method or methods will you use? Explain the appropriateness of the methodology. You may explain the procedure you will use, describe the sample, and the instrument. E.g. survey 400 students, conduct case studies of ten businesses, etc. You will work with your advisor and other faculty in developing your methodology.

Timeline

Provide a timeline or work plan. It is not set in stone, but setting milestones and deadline dates may help assure you complete the project in the manner and quality that you desire.

References

*Graduate School note: If you do a thesis, following the format standards and timelines set by the Fort Hays State University Graduate School are important. These may be found on the Graduate School’s portion of the FHSU website.

Appendices

These are optional, but may include survey instruments, focus group notes, or other tools that will be useful to the committee.

Project Proposal

This is the format you will use if the student’s culminating effort is a project:

Title Page
Abstract
This is a 200 word or less summary of the document.
Table of Contents
Assessment of Need
This section should answer the question: “What are the needs of the client or end user? Data may be gathered from interviews, questionnaires, network measurements, or other acceptable applied research methods. What will the website, network, etc. be expected to do? The more specificity this section includes, the better. Stating “the client needs a website to get in front of people” will not be satisfactory. Define the client’s needs and expectations. Who will the users be? Is there a theme to the site? What information is to be provided? What type of transactions will the site support? What are the site’s security needs?

Statement of Problem/Review of Literature
One of the goals of the INT Faculty is to assist you in your effort to become a life-long learner who can research and find information that assists in decision making. Even a project will have a brief review of the literature. If the student is designing a network, this section may include a discussion of equipment and wiring options. It may provide a logical discussion and explanation of the decision to select the equipment or software selected for the network. For example, a student may define and compare capabilities and cost structures of ATM and Frame Relay. He or she may compare differing routers or switches. Resources for this review of the literature may come from manufacturers’
websites, product comparisons developed by independent labs, definitions from technical publications, best practice case studies, etc. If a person is developing a website, the review of the literature may include a discussion of key web development techniques and tools that will be relevant to the site. The review should focus on both technical and human computer interaction (HCI) aspects of site. In most cases, a minimum of six resources will be used in appropriate citation format.

References
Use a standard format such as APA, MLA, Chicago Orangebook, or Harvard Bluebook consistently throughout your proposal.

Plan/Methodology
This section informs your committee of what you intend to do. Outline your steps, procedures, methods. How do you plan to address the needs of the client applying the information from the review of the literature?

Timeline
Provide a timeline or work plan. It is not set in stone, but setting milestones and deadline dates may help assure you complete the project in the manner and quality that you desire.

Project Outcome and Measurements (What will you expect the outcome to be?)
What will the project outcome be? How will you measure the result? This is the most difficult part of the project proposal for many students. However, employers, investors, policy makers and other decision makers increasingly demand measurable outcomes (metrics). You will determine what measures to use in your proposal and then apply these measures to the final work. For example, you will test and troubleshoot the network you designed. You will have the client assess the website you developed using an assessment tool that has the client rate the site on relevant factors. You will have students and faculty beta test the lab you developed.

Learning Outcomes (What do you expect to learn?)
The culminating project’s purpose is to foster learning and to demonstrate your mastery of the subject matter. What do you expect to learn from this project?

Appendices
These are optional, but may include survey instruments, hard copy of the website, or other tools that you believe will be useful to your committee.

Final Project Report and Presentation
You will present the completed project to your committee and will be questioned. You will be responsible for scheduling your committee. If you are an on-campus student, you will probably give your presentation face-to-face. In that case, schedule 60 minutes for the final presentation. Your presentation should not exceed 30 minutes. The remaining time will be used for the committee to ask you questions and for you to respond. If you are a Virtual College student, you are encouraged to be creative and to maximize use of the technology. Presentations can be
done through email with a mixture of PowerPoint and a text document, voice over PowerPoint, Streaming Video, Interactive Video and/or conference call. If you would like to come to campus, that is acceptable as well. Discuss the presentation with your advisor.

Original Research

This is the classic thesis defense. While you will have shared drafts with your advisor, committee members and other faculty for comments and input previously (and you will have listened or read and integrated the comments and input), at this stage, you will make a formal presentation. You will provide a brief summary of the literature and will present the research question and methodology. Your primary emphasis will be on your findings. You will provide a text copy of the completed document to each committee member substantially ahead of time so that your work may be reviewed.

The completed research document will be organized largely in the same manner as the proposal, but you will note some additional divisions. Refer to the description of the project proposal for an explanation of the Review of the Literature.

Title Page

Abstract
This is a 200 word or less summary of the document.

Acknowledgements
Acknowledgements are optional, but advisors, spouses, employers and others who have joined in sacrificing to help you accomplish your masters degree may deserve recognition and thanks.

Table of Contents

Table of Tables

Introduction of the Topic and Justification
This section explains what your topic is and the purpose of your research. Support from primary sources is important in introducing the topic

Review of Literature

Methodology
What research methods did you use? Explain their appropriateness and how you applied them. E.g. survey 400 students, conduct case studies of ten businesses, etc.

Research Results
Organize your findings in order to communicate with the reader. Use sub-headings and present using graphs, charts, tables and other visual tools that will help to communicate your findings.
Forecasts for Future Research

What research should be conducted to extend the research that you have done or to answer questions that you have uncovered? What is the logical next step for researchers in the field?

References

Appendices

These are optional, but typically include feedback instruments, survey letters or scripts, focus group scripts, lengthy statistical information too lengthy to have in the text. Include information that you believe will be important to your committee and to other readers.

Final Project Report

For students who select a project, this is a presentation that demonstrates and showcases the project that has been completed and demonstrates to your committee that you have graduate level mastery of the subject. You will present the project that you have completed. You will demonstrate a website, explain the network or lab that you have developed and respond to questions about the project.

You will typically provide a project document to your committee several days ahead of your presentation. The completed project document will be organized largely in the same manner as the proposal, but you will note some additional divisions. Refer to the description of the project proposal for an explanation of the Review of the Literature.

Title Page

Abstract

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Introduction of the Topic and Justification

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Review of Literature

Plan/Methodology
What methods or processes did you use? Explain their appropriateness and how you applied them.

Project
This section will vary tremendously. In sum, this is the key section. What did you do? Students will include pages of description, story board, flow charts, screen prints, photos, web links and/or network diagrams based upon the type of project. You want faculty to be able to access and examine your project in the best form possible.

Project Outcome and Measurements
What was the project outcome? How did you measure the result? How did you test and troubleshoot the network you designed? What was the result? Did you have the client assess the website? What was the feedback? Did you make revisions based upon this feedback? Did you have others who are members of the relevant audience or who are experts assess the site? Did you make revisions based upon this feedback? Did you enter data in to the web enabled database to test it and to demonstrate its abilities? Did you have students and faculty test the lab you developed? Share results of your testing. Do you have benchmarks to compare with these results?

Learning Outcomes (What did you learn?)
The culminating project’s purpose is to foster learning and to demonstrate your mastery of the subject matter. Upon reflection what did you learn doing this project? What skills and subject matter mastery has this project demonstrated?

References

Appendices
These are optional, but may include information that does not fit a category above, but that you believe will be useful to your committee.

Relationship of Culminating Project to Other Graduate Program Requirements

Intent to Graduate Forms
Students must file an Intent to Graduate Form with the Fort Hays State University Graduate School in the semester you intend to graduate. If you do not graduate in that semester, you must file a new document with the Graduate School when you are ready to graduate.

Comprehensive Examinations
Each applicant for a graduate degree must satisfactorily pass a comprehensive examination over the subject fields of the program. The comprehensive examination is not merely a reexamination of materials covered in coursework, but is a test of the graduate degree candidate’s ability to integrate materials from the graduate major and any related or supporting fields. If a student writes a thesis or performs a culminating project, the student will sit for a total of four hours of comprehensive examinations. If a student does not perform a thesis or culminating project, the...
The student will sit for a total of eight hours of comprehensive examinations. The comprehensive exam may be written and/or oral. Written exams may be take-home exams completed by the student at a remote location. The faculty advisor and graduate committee will determine the type of comprehensive examination a student will take. The student’s subject matter focus, developed area of expertise, and other factors will affect the faculty decision.