

Q&A: Answers to Frequently Asked Questions about the Capstone (Non-laboratory Thesis) Option for JCGS Master's Degree

The Capstone Option is a new option for the JCGS Master's Degree programs at TJU. The full Capstone Project Manual is posted on the JCGS web site. However, some questions have been asked so frequently that we have created this short list of questions and answers. This list is not exhaustive. If there is a question you do not see presented in this brief overview document, please contact us in Jefferson Alumni Hall, Room M-46. Your additional questions will help improve this document

Q: What is the Capstone Option and how is it different from the traditional laboratory research-based thesis?

A. The traditional laboratory research-based MS thesis option requires six (6) credits of research resulting in a written thesis, oral presentation and defense of the research work in a public forum. Instead of the laboratory or bench-based research path, the new Capstone Option will require independent study and research integrated within a Capstone Project. The culminating Capstone Project will result in a formal scholarly work reflecting integration of the scientific knowledge and technical and management skills learned in the program through didactic course work focused in an area chosen jointly by the student and the Capstone Advisor with the approval of the Program Director. The Capstone Project will be supervised by a Capstone Project Committee. In much the same manner as a traditional laboratory research thesis, the final Capstone Project thesis document will be approved by your Capstone Committee, presented publicly and defended as would a laboratory research thesis.

Q. What are some examples of a Capstone Project? What kinds of topics could I choose?

A. The Capstone Project, as noted above, will result in a scholarly paper and public presentation of the results of your research. Some examples are illustrated below:

- A scientific concept and associated policy discussion with its implications, *e.g.*, what might the ethical and practical barriers be to the acceptance and use of pharmacogenomics data for either stratification of patients in a clinical trial or the pre-selection of appropriate groups of potential responders for clinical trials for a specific drug, vaccine, or biologic agent such as a monoclonal antibody;
- An analysis and solution of a real life problem at the student's place of employment, *e.g.*, scale-up issues in a GMP cell culture facility or development of a "Six Sigma" approach to process improvement, validation and implementation;
- For a graduate student employed in a secondary education environment, the development of science course materials for students or other teachers (including a mechanism for assessment) potentially involving on-line or hybrid mechanisms of course material delivery or perhaps computer simulations with avatars in a Second Life world as a model educational experience;
- Development of validated outcomes questionnaires for a specific therapeutic target that also addresses the assumptions and the mechanisms for quantification of the results;

- A program planning, evaluation and implementation plan in response to changing regulatory requirement(s) such as how a requirement for the elimination of certain source materials in a manufacturing process might be documented, validated and implemented;
- A strategic and tactical plan for implementation of an activity in the workplace, *e.g.*, how might good laboratory practices (GLP) be implemented in a non-discovery laboratory setting such as a clinical pathology laboratory in a hospital;
- A detailed evaluation and statistical analysis of clinical case report form data in response to a specific scientific hypothesis;
- A detailed discussion of a specific scientific research topic of particular interest to the student with possible implications at the student's place of employment, *e.g.*, what might the role be for expert system-based experimental design software in optimizing large-scale cell culture for the production of monoclonal antibodies.

Q. I just started a MS degree program and I do not know which option is best for me. Is there a deadline for making this decision?

A. Many students will make the decision (traditional laboratory research thesis or the Capstone Thesis Option) when they matriculate into a degree program based upon their current employment situation and career goals. We realize that situations change and students may need to reevaluate their initial decision. However, if you start out as "undecided", you should plan to make a decision at the latest within 1 year (4 terms) of starting your program. Deciding later could delay the time needed to complete your degree. Active discussion with your Program Director is encouraged at all stages of your decision making process.

Q. I have just started doing laboratory research for my master's thesis. However, circumstances have changed at my job and I find that I will no longer have access to a lab for my research. As I have taken all of my science and management courses, I am actually quite far along in my program. Can I switch to the Capstone Option at this late date from the thesis option?

A. One of the key drivers for instituting the Capstone Option was the realization that not only career goals change over time but sometimes those career changes are not within your control especially in industry. Voluntary and involuntary career changes that take students out of the laboratory setting can and do happen. In consultation with your Program Director, it might be possible to take much of the literature research done in advance of initiating a lab-based thesis project and utilize it towards a Capstone Project thesis. There may be some lost-time in "retooling" but this can be kept to a minimum by good coordination and consultation with your Program Director.

Q. I am in the planning stages of deciding which way to go. How much time should I plan to devote to the Capstone Project portion of my degree program?

A. It is anticipated that the Capstone Thesis Option should take about the same amount of time as the traditional laboratory thesis option. Hence the Capstone Project should

entail 7-10 months for independent study, research, topic development and writing prior to the formal public presentation of the Capstone Project Thesis.

Q. I would like to do the Capstone Option. While I have not started to do any of the work, I have registered for the Clerkship and Master's Research Thesis. Can I switch classes?

A. While a component of a clerkship is still required for the Capstone Option as it is for the traditional laboratory thesis option, switching from the Laboratory Research Thesis Option to the Capstone Project Option will not require any changes to actual classes or your records. You will still enroll in BI/CB/MI/PR 870,880 or 890 as Master's Thesis Research for a total of six (6) credits. The Capstone Project Thesis Research will be graded Satisfactory/Unsatisfactory and still represents a thesis albeit not a laboratory-based one. The final grade, as with the laboratory research thesis option, will not be entered into your official record until the completion of all required work and the submission of the final Capstone Project thesis document in addition to the successful presentation and defense of the Capstone Project thesis in a public forum.

Q. I started in one of the Master's degree programs many years ago but have not been active in the program in a few years. Can I activate my student status and switch to the Capstone Option?

A. The first activity you should initiate is consultation with your Program Advisor in the program office in Jefferson Alumni Hall Room M-46 and a discussion concerning whether this is the best option for you to pursue. There is no fee for reinstatement in the TJU master's degree programs but you must provide a formal request in letter format to the Associate Dean stating your request to be reinstated in the graduate school and your degree program. The choice between either the laboratory thesis or Capstone Thesis Option for completion of your degree will primarily depend upon your professional objectives and you should consider how each of these options would advance your career.

Q. If this is really a non-laboratory based research thesis, why should I have to complete a clerkship to satisfy the graduation requirements for the MS degree?

A. Over the past few years, JCGS has been more flexible about the requisite six credits of clerkship for degree completion. We have become more accommodating by reassessing the student's career goals and, in some instances, allowing the student to reduce the total clerkship credits from six (6) to three (3) credits. This has permitted the student to take additional elective classes thus improving their skill sets by being able to explore additional topics. This does not however reduce the total number of required credits below 40 and all students still took a minimum of three (3) credits of clerkship. The same philosophy is envisioned for the clerkship in the Capstone Option. Depending upon the topic chosen, the clerkship might become a modified internship or shadowing experience where a student could lay the groundwork for the planning and successful completion of the independent study and research required for the Capstone Project Thesis.