RES 6200/RES 6201: Master's Research Thesis

Instructor:	Dr. Anastasia Levitin
Contact Information:	anastasia_levitin@kgi.edu
Office Hours:	By appointment (https://calendly.com/alevitin)
Thesis Committee:	Primary Thesis Advisor and Committee Member
Dates:	2-semester project (Fall and Spring)
Credits and Hours:	6 credits total (3 credits/semester or 6 credits completed in one semester, Infectious Diseases and Bioprocessing concentrations, Option A)
	12 credits total (6 credits/semester, Translational, Clinical, Public Health, Community Medicine, Infectious Diseases and Bioprocessing concentrations, Option B)
Location:	Thesis Advisor research location
Graduate Assistant:	Claudine S Ignacio
Contact Information:	CIGNACIO19@kgi.edu
Office Hours:	By appointment

Course Description

This course enables second-year students enrolled in the Master of Science in Applied Life Sciences program to conduct rigorous primary or secondary translational, infectious diseases, bioprocessing, clinical, or public health research, leading to a Master's Thesis. Thesis requirements will differ by discipline, but in all cases, they will be modeled after a basic thesis, publication, or grant proposal and have common components. These components include an abstract, introduction, results, discussion, figures and legends, and a bibliography.

Requirements

- Must be in the second year of the Masters of Science in Applied Life Sciences program.
- Must form a Thesis Committee, including a Thesis Advisor and a Committee Member, who must agree to advise the student. The student should work with the Thesis Advisor to identify a Committee Member (faculty member or research collaborator with a PhD degree and expertise in the project research area or a health practitioner for clinical or public health research projects).
- The RES 6200/RES 6201 Research Thesis Contract must be signed by the Thesis Committee and the MS Program Director and submitted to the Registrar's office by the end of the first week of the Fall semester. If the identified project is offered outside of KGI, the MS Program Director must approve the project before the start date and will sign the RES 6200/RES 6201 Research Thesis Contract.

Additional Clinical Thesis Requirements

- Complete the COPE-KGI Master's Thesis Project online application by May 1 of the program's first year.
- Schedule and complete an in-person interview with the potential Thesis Advisor and Site Preceptor when requested by the COPE Health Solutions Program Manager.
- Complete the hospital clearance process by site-specific deadlines.
- Complete all required online training modules AND pass the written entrance exam with a minimum score of 80%.

Translational, Infectious Diseases, Bioprocessing, Community Medicine, and Public Health Thesis Project Identification

- The students are advised to identify a project of interest during the 1st year of studies and conduct Independent Research (primary, including bioinformatics project) or Independent Study (secondary research, literature overview, writing a review of the literature in the research field).

Learning Outcomes and Evidence Used to Assess Outcomes

Course Learning Outcome	Evidence Used to Assess Student Learning
Develop a deeper understanding of research design and methodology	Literature Review and Outline, Research Symposium Thesis Defence, and Methods section of the Final Thesis
Generate hypotheses and perform hypothesis-driven research	Full Proposal, Research Symposium Thesis Defence, and Final Thesis
Assess the literature, identify knowledge gaps and convey findings to the scientific community	Literature Review and Outline, Full Proposal, Research Symposium Thesis Defence, and Final Thesis
Analyze and report data results	Lab journal/research notebook, Research Symposium Thesis Defence, and Final Thesis
Apply appropriate research methodology to the design and completion of the project	Research Symposium Thesis Defence, Final Thesis

Required Course Materials

The Thesis Advisor will provide all the required materials or IT resources to complete the project (*e.g.,* clinical clearances, textbooks, computer programs, etc.). Students will also routinely use electronic journal resources, databases, and other materials available through the Honnold Library.

Course Assessment

- Research progress and record-keeping assessments will be the responsibility of the Thesis Advisor/Thesis Committee, with a letter grade assigned at the end of each semester based on the Thesis Advisor/Thesis Committee's feedback and timely submission of the deliverables.
- Students completing the course in one semester (option A, 6 credits) must submit all the assessments during the semester of their research experience.
- The Thesis Advisor must approve all milestone submissions before submission to RES 6200/RES 6201 site on Canvas.

Components of each semester's assessment include the following:

- Students registered for 6 credits/semester must dedicate a minimum of 18 hours/week to the project.
- Students registered for 3 credits/semester must devote a minimum of 9 hours/ week to the project.

Fall Semester		
Deadline	Deliverables	%
Sundays	**Weekly Status Reports** Weekly Status Reports must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submission types will be graded (see late assignment policy) • Weekly Status Reports form is available on Canvas	15%

Fall Semester Milestones

First Sunday of the Semester	**1. Thesis Title and Thesis Committee contact information** (Canvas submission) **2. Certificates** (laboratory safety and/or appropriate CITI training, Canvas submission)	25%

Training	Concentration	Offered by
Responsible Conduct of Research	All	CITI Ethics Modules. See the registration Instructions below
Health Privacy	Clinical Thesis Research	
Human Subjects Research	Public Health Research	
Laboratory Safety Training •	Translational, Infectious Diseases, and Bioprocessing Research	Thesis Advisor/Jasmine Yu (Lab Safety Manager)

10/1	**3. Literature Review and Project Outline** • Must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded (see below for late assignment policy)	25%
12/1	**4. Research Proposal** • Must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded (see below for late assignment policy)	
12/10	**Research Progress** • Graded by the Thesis Advisor/Thesis Committee • Thesis Advisor must submit the Fall Semester Research Progress grade and rubrics directly to the Program Director/Graduate Assistant The Fall Semester Research Progress grade assesses: • Research progress/effort and quality of research performed • Quality of the Research Project Outline and Literature Review submission (Written Thesis Rubric) • Quality of the Research Proposal submission (Written Thesis Rubric)	50%

12/10	**Research Notebooks** • Graded by the Thesis Advisor/Thesis Committee • Assessment of record keeping	10%

Spring Semester		
Sundays	**Weekly Status Reports** Weekly Status Reports must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded (see below for late assignment policy) • Weekly Status Reports form available on Canvas	15%

Spring Semester Milestones		
4/1	**1. Research Symposium Poster Abstract** • Must be approved by the Thesis Advisor before Canvas submission (see below for the format information)	
4/7	**2. Research Symposium Poster** • Must be approved by the Thesis Advisor before Canvas submission as a .pdf file (see below for poster printing information and poster Presentation Rubric)	
4/1	**3. Thesis Draft submission to the Thesis Committee** • Must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded (see late assignment policy, Written Thesis Rubric)	10%
4/20	**4. Final Thesis submission** • Must address questions and concerns the Thesis Committee and Research Symposium Reviewers raise • Must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded (see late assignment policy, Written Thesis Rubric)	
4/26-4/27	**Research Symposium** Requirements: • Students must attend the entire event (sign in and sign out with the Graduate Assistant), present their poster during the assigned session, and assess assigned posters (Poster Presentation Rubric). • Poster must be ready and mounted to the assigned spot by 8:00 am on the event day • Attire: Business Casual with Name badge	15%
5/1	**Research Progress** • Graded by the Thesis Advisor/Thesis Committee • Thesis Advisor must submit the Spring Semester Research Progress grade, rubrics, and Thesis Completion Form directly to the Program Director/Graduate Assistant	50%

	The Spring Semester Research Progress grade assesses: - Research progress/effort and quality of research performed - Quality of the Thesis Draft submission (Written Thesis Rubric) - Quality of the Research Poster submission (Poster Presentation Rubric) - Quality of the Final Thesis submission (Written Thesis Rubric)	
5/1	Research Notebooks - Graded by the Thesis Advisor/Thesis Committee - Assessment of record keeping	10%

Late Assignment Policy

Unless a justifiable excuse is approved before the due date, assignments submitted after the due date will be deducted 10% for every delayed calendar date. The students are responsible for ensuring the files submitted electronically are in working order for an assessment. The submission of corrupted files will result in zero grades on the assignment.

Milestones Grading Timeline

- On-time submission (submitted the day the milestone/report is due) = 100%
- 1-day delay in submission = 90% (10% grade reduction)
- 1-week delay in submission = 50% (50% grade reduction)
- Milestone/report submitted after 1 week = 0%

Course Grading Distribution

Letter grades will be assigned based on the final percentage in the course, with the class mean set within the B+ range.

Letter	Absolute Score	Characteristics of the grade
A	> 93.00%	Performance significantly above expected levels
A-	> 90.00%	Performance moderately above expected levels
B+	**> 87.00%**	**Expected level of performance**
B	> 83.00%	Performance moderately below the expected level
B-	> 80.00%	Performance significantly below the expected level
C+	> 77.00%	Passing but marginally acceptable performance
C	> 73.00%	Very poor performance
C-	> 70.00%	Unacceptably poor performance
F	<69.99%	Failing performance

Thesis Committee

- The thesis student must secure a 2-person committee consisting of the Thesis Advisor and a Thesis Committee Member who must agree to advise the student. The student should work with the thesis advisor to identify a Committee Member (faculty member or research collaborator with a PhD degree and expertise in the project research area or a health practitioner for clinical or public health research projects).
- Both Committee Members must approve the Thesis for the student to graduate with an MS in Applied Life Sciences degree. In case of a disagreement between the Committee Members, a

third member will be asked to evaluate the work. Final approval would be based on the majority agreement amongst the Committee Members.

Research Notebook

- Thesis students must keep a research notebook, a complete record of a scientist's procedures and observations while conducting research.
- It should contain any necessary background, references, and information on how the experiments were performed, along with experimental results.
- The research notebook is a legal document in the case conducted research that contributes to issuing a patent and the lab's scientific legacy.
- The research notebook may be a paper notebook or an electronic file that will be used to record details and experimental results.
- The entries in the lab notebook must be detailed, clear, and legible and should be identified with an entry or experiment's date. Each entry should contain a summary of a finding and possibly a plan for future experiments.
- Notebook/record keeping will be graded at the end of each semester by the Thesis Advisor/Committee

Literature Review and Project Outline

- Document format should be discussed with the Thesis Advisor

Suggested elements:

- Review of literature/references supporting the study
- Problem statement
- Hypothesis/research questions
- Description of research design
- Description of data collection methods

Work will be graded by the Thesis Advisor/Thesis Committee (Written Thesis Rubric)

Research Proposal

- Document format should be discussed with the Thesis Advisor

Suggested elements:

- Fully formed literature review/background section
- Clearly articulated problem statement
- Clearly articulated hypothesis/research questions
- Detailed description of research design and methodology; must include a description of data collection and storage, software/programs that will be used, analysis methods (*e.g.,* statistical tests, coding schema), and time frames for data collection

Work will be graded by the Thesis Advisor/Thesis Committee (Written Thesis Rubric)

Research Symposium

Symposium attendance/poster presentation is a required event. Students must attend the Symposium in person and stay for the entire event, presenting during the assigned time or scoring their fellow presenters' posters.

- Students must be available at their posters to discuss their research during the assigned session and will receive a grade for their research presentation

- During the alternative session, students will use this one-on-one time with presenters to learn more, ask questions, and assess the posters of their peers (Poster Presentation Rubric)
- Symposium schedule will be sent out before the event

Poster abstract

- Summary of work performed
- Word count - 250 words
- Fit for public viewing and should not contain sensitive/confidential information
- Must be approved by the Thesis Advisor before submission

Poster

- Vertical format (2ft x 3ft)
- Must be approved by the Thesis Advisor before Canvas submission

Poster printing

- Students working on KGI thesis research projects should work with their advisors to print their posters, and the advisors should cover the cost of poster printing
- Poster must be ready and mounted to the assigned spot by 8:00 am on the event day
- The program will cover the cost of poster printing only for the students who perform their research with non-KGI faculty outside of KGI, provided that the .pdf version of the poster is submitted by the deadline (Research Symposium Poster milestone section, above)
- The poster printing venue is Duplicating Services at Pomona College

Thesis

Thesis is a confidential document and the Thesis Advisor's property. It will not be published but kept for KGI records.

Thesis Committee should review the Thesis Draft and return it to the student with comments and suggestions.

The final version of the Thesis must address all the suggestions and concerns raised by the Thesis Committee and Research Symposium Reviewers

Thesis format should be discussed with the Thesis Advisor

Suggested elements:

- Abstract
- Fully-formed literature review/background section
- Clearly articulated problem statement
- Clearly articulated hypothesis/research questions
- Detailed description of research design and methodology; must include a description of data collection and storage, software/programs that will be used, analysis methods (*e.g.,* statistical tests, coding schema), and time frames for data collection
- Results section
- Analysis and discussion
- Reference list

Work will be graded by the advisor/committee (Written Thesis Rubric)

Academic Integrity & Honor Code

KGI is committed to the highest ethical and professional standards of conduct. Ethical conduct is an integral part of KGI's mission of education and research aimed at translating into practice for the benefit of humanity, the power, and the potential of the life sciences. The Institute expects all members to regularly observe and exhibit ethical behavior, honesty, integrity, and good judgment in all facets of their work and relationships with the Institute. Each member is expected to demonstrate respect for the rights of others and is accountable for their actions.

To assist students in understanding their responsibilities under the Honor Code, the following is a partial list of conduct pertaining to academic matters which violate the Honor Code. Prohibited conduct includes, but is not limited to, the following:

1. Plagiarism
   - Knowingly appropriating another's words or ideas and representing them as one's own
   - Use of another's ideas or words, including paraphrasing, without acknowledging the source
   - Professor may use "Turnitin" plagiarism detection software for assignments
2. Provide false information, data, results, or any other misrepresentation of work
3. Cheating
   - Unauthorized collaboration on assignments
   - Unauthorized sharing of information about examination content or questions
   - Use of previously submitted coursework for alternate purposes without prior approval
   - Use of any unauthorized materials or electronic sources for exams or assignments
4. Impeding the learning of others, including but not limited to interrupting another student's exam, requesting unauthorized information, or taking credit for another student's work

Reported violations of the Honor Code will be investigated. Failure to follow the Honor Code will carry sanctions, including an F for the assignment, exam, or course. Impeding investigation, providing false statements, or failing to report violations are considered violations of the Honor Code.

Ignorance is NOT an excuse. The student is responsible for learning from the individual instructor the procedure for acknowledging sources and indicating quotations as required for each assignment.

To report a violation of the KGI Honor Code or for more information, please visit the Student Conduct site.

Copyright Policy

Students are also advised to refer to the KGI Copyright Policy to understand the policies surrounding the protection of intellectual property and rules surrounding file-sharing and the use of the software. KGI Copyright Policy.

Academic & Personal Support

KGI is committed to the success of our students. Don't hesitate to contact the instructor and teaching assistants for assistance if you require additional support for this course. Peer tutoring is also available for many classes through the Academic Tutors site. The Academic Affairs Office can provide additional course, program-level, and personal support and referrals.

Accessibility Support

Keck Graduate Institute is committed to providing an enriching academic experience for all students. In compliance with the Americans with Disabilities Act, it is the policy of KGI to provide reasonable

accommodations for students with disabilities. Any student with a documented disability who requires reasonable accommodations should contact KGI Student Accessibility Services.

Diversity & Inclusion

KGI is committed to enriching society with breakthrough education and translational research approaches. The diversity of backgrounds, cultures, disciplines, identities, and thoughts within our community serves as a catalyst for collaboration and excellence in all of our pursuits. KGI's welcoming, diverse environment allows our students to think creatively and critically, communicate and interact effectively, and act ethically and respectfully. Every community member's active and open-minded engagement is vital to achieving the institution's goals.

Office of Title IX: The Office of Title IX provides information about how to get help or help someone affected by harassment or discrimination, domestic violence, rights of protected classes, reporting options, and additional resources.

Mental Health and Wellness Resources

KGI values the full participation of all students in academic and campus life. We recognize that various stressors can impact learning, mental health, and connecting with others. If you are having difficulty coping with life's challenges, need someone to talk to, or just want some extra support, know that help is available, and you are not alone. The Division of Student Affairs can offer you support and resources (kgistudentaffairs.slack.com). Some resources include, but are not limited to:

Campus Health: www.7C.Health provides free 24/7 on-demand access for students to get quality medical and mental health care online or from their phones anytime they need it. Use your student SSO login information to access.

Monsour Counseling and Psychological Services (MCAPS): 909-621-8292
https://services.claremont.edu/mcaps MCAPS is committed to promoting psychological wellness for all students served by the Claremont Colleges Services.

Campus Safety: From a cell phone or off-campus phone, call (909) 607-2000 or (909) 607-7233. Campus Safety can provide non-emergency assistance or information in a variety of areas.

National Suicide Prevention Lifeline: 1(800) 273-TALK (8255) – 24/7 on-call
www.suicidepreventionlifeline.org The lifeline provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, seven days a week.

Have additional questions? Please check out the KGI Student Handbook.

Poster Presentation Rubric

Instructions for completion: Please carefully review the Student Poster to assess the questions presented below in the context of the KGI Learning outcome "Students can communicate effectively in an environment composed of scientists, engineers, and business professionals."

Student: _____**Evaluator:** _____

PRESENTATION	Score (circle one)				EXCELLENT (4)	GOOD (3)	FAIR (2)	POOR (1)
PRESENTATION DELIVERY	4	3	2	1	Clear speech, strong voice, good grammar	Presentation is easy to follow. Some reading off poster, minor speech or grammar errors	Weak voice, passive grammar, and/or extensive reading off poster	Presentation is hard to follow, hard to understand, confusing
VERBAL SUPPORT OF POSTER	4	3	2	1	Compelling storyline for poster; well connected to presentation flow	Adequate discussion supporting poster	Limited support for poster, too much reading of poster content	Verbal discussion; disconnected with poster
ENERGY AND CONNECTION WITH AUDIENCE	4	3	2	1	High energy, good eye contact, strong communication style	Solid presentation but not exciting style	Somewhat mechanical and rehearsed style but directed to audience	Low energy and does not involve audience
CONTENT	4	3	2	1	Content is accurate and complete	Content is generally accurate but not entirely complete	Content is overly general, with substantial inaccuracies and gaps in content	Content is inaccurate, overly general, and incomplete
STRENGTH OF ARGUMENT	4	3	2	1	Data provides convincing evidence to support conclusions; source material employed is of the highest relevance and quality	Data provides acceptable but not overly strong support for conclusions; source material employed is of adequate relevance and quality	Data does not provide sufficient support for conclusions; source material employed is of inadequate relevance and quality	No evidence provided to support conclusions; source material employed is absent or does not contribute to claims(s) or argument(s)
ORIGINALITY	4	3	2	1	Reviewers are likely to gain creative and fundamental insights into the topic	Reviewers are likely to gain fundamental insights into the topic	Reviewers may learn isolated facts but are unlikely to gain fundamental insights	Reviewers are unlikely to learn anything or may be misled

Comments:

Thesis Completion Form

We, the undersigned, certify that we have read this Thesis of
_____ (*Student Name)* and approve it as adequate in scope
and quality for the Masters of Science in Applied Life Sciences program.

Thesis Advisor:

_____

Signature   *Printed Name*   *Date*

Thesis Committee Member:

_____

Signature   *Printed Name*   *Date*

MS Program Director:

_____

Signature   *Printed Name*   *Date*

CITI Ethics Modules Instructions

Collaborative Institutional Training Initiative (CITI)

Online Training Registration & Course Selection Instructions

Keck Graduate Institute (KGI) has contracted with the Collaborative Institutional Training Initiative (CITI) to provide online training which meets our federal and state requirements in various areas.

Instructions are provided below.

Instructions

CITI training meeting KGI's requirements, including certification that training has been completed, can be accomplished by logging on to and registering with the Collaborative Institutional Training Initiative (CITI) Program website.

Click on **Keck Graduate Institute** as your affiliated subscriber organization. Please make sure you select the correct institution! Log in using your KGI username and password (your KGI email username and password).

Once you log in, find the box entitled, "My Learner Tools for Keck Graduate Institute." Select "add a course." For "Question 1: Responsible Conduct of Research," you will select "Faculty, Staff & Students." Under "Question 2: Human Subjects Research," you will select "Human Subjects – Students."

The CITI program online course modules are self-paced and may be interrupted and resumed. Training time varies depending on your prior preparation and other factors, usually entailing no more than a couple of hours.

Thesis Weekly Status Report

Student Name:_____

Weekly Status Reports must be emailed to the Thesis Advisor, MS Program Director, and MS Graduate Assistant and uploaded to Canvas. Both submissions will be graded.

- On-time submission (submitted the day the milestone/report is due) = 100%
- 1-day delay in submission = 90% (10% grade reduction)
- 1-week delay in submission = 50% (50% grade reduction)
- Milestone/report submitted after 1 week = 0%

Thesis/IR work period (*e.g.,* 9/5 -9/5/22)**:** _____

Day of Week	Hours (*e.g.,* 9am-2pm)
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Other	

Total hours contributed: _____

Accomplishments:

Written Thesis Rubric

Student: _____ **Evaluator:** _____

		Excellent	5	4	Emerging	3	2	Below Expectation	1	N/A
	Organization and progression of thought	Carefully organized, logical progression of thought, clear headers, sub-sections, motivate the significant questions that are addressed, present questions in t h e context of current literature; shows significant originality of thought			Follows general guidelines, some evidence of systematic progression, some recognition of significant questions, and some evidence of originality in thought			Inadequate or no apparent organization, disjointed train of thought		
	Data Presentation	Appropriate use of tables and figures, with sufficient textual description, avoidance of redundancy			Some use of tables and figures			Predominantly text, making little use of tables, figures		
	The link between data and conclusions	Able to substantiate objective conclusions deduced from results of data or theory			Provides acceptable but not overly strong substantiation of conclusions from data			Conclusions are not supported by sufficient evidence		
	Analysis	Insightful analysis; original arguments are made that are non-obvious and require independent thinking; uses or proposes appropriate objective (statistical or mathematical) methods for addressing sources of uncertainty and draws attention to alternate interpretations			Some attempt to develop an independent analysis, but most of the analysis draws directly from derivative ideas, evidence of objective methods engaged for data, and uncertainty analysis.			Little evidence of independent analysis; little evidence of objectivity in data analysis		
	Grammar & Style	The text is precise, features correct spelling and grammar, and shows a syntactic variety			The text contains occasional grammatical and spelling errors and has a limited syntactic variety			Errors in grammar, spelling, and style interfere with the ability to understand the document		
	Citation of information sources	Properly formatted citations are inserted wherever necessary			Citations in most necessary places may contain some formatting errors			Inadequate citations or no citations at all		

Comments: