

Department of Chemistry
Senior Project Evaluation

Date: _____

Student: _____

1st Reader: _____

2nd Reader: _____

3rd Reader: _____

assigned after departmental meeting

Senior Project Grade: _____

NOTE: ALL THREE AREAS MUST ACHIEVE THE "DEVELOPING" THRESHOLD FOR A PASSING GRADE

A. INVESTMENT

					unsatisfactory	developing	proficient	exemplary		
					Contributing factors to INVESTMENT					
	never	seldom	sometimes	often	almost always					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	time commitment	the student spends an appropriate amount of time each week conducting experiments, synthesizing literature, and analyzing data (at least 8 hr/week for CHEM 600/BCHEM 600; 16 hr/week for CHEM 610/BCHEM 610) in regularly scheduled time slots (agreed upon with the research advisor).			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	efficiency and productivity	the student uses the time in the lab (and/or meeting times) wisely, having adequately prepared beforehand, multitasking as much as possible; a suitable quantity of experimental or written results is generated each week.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	initiative	the student takes active steps to move the project forward without prompting; reasonable efforts are made to solve problems as they are encountered.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	project management ■ SPA 2 Independent Project Planning & Development	the student is cognizant of the overarching goals of the project and is able to move priorities dynamically to achieve the goals; specific benchmarks are set and used to monitor progress.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	engagement in the scientific process ■ SPA 4 Evaluation and Use of Information	the student critically evaluates literature data and experimental results as they are discovered and leverages these results to inform appropriate next steps in the project.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	self-efficacy ■ SPA 5 Integrative Thinking	the student is able to integrate all the necessary components of literature research, preparation, execution, and analysis to successfully complete discrete laboratory tasks, writing, analysis, and synthesis in a timely fashion.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	self-reflection ■ SPA 6 Reasoning	the student creates coherent meaning from individual components of the project, and is able to articulate the reasoning behind actions taken or planned; inconsistencies and confusion in thought processes are self-identified.			

B. EXPERTISE

					unsatisfactory	developing	proficient	exemplary		
					Contributing factors to EXPERTISE					
never	seldom	sometimes	often	almost always	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	foundational knowledge ■ SPA 1 Disciplinary Proficiency the student demonstrates an understanding of the basic chemical principles underlying all aspects of the project, as well as an appreciation for how the project fits into the larger context of what has been done before.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	technical sophistication the student exhibits the understanding required for the reliable and reproducible execution of experimental tasks, according to accepted best practices; experimental or anticipated results are clear and realistic; proper control experiments are included, and the strengths and weaknesses of approaches are appropriately considered.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	literature research ■ SPA 3 Locating Information the student takes initiative in locating appropriate information (journal articles, monographs, etc.) throughout the project; literature research is carried out using proper databases and effective search strategies; the project is conducted as a living conversation between project outcomes and the available literature.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	creativity the student takes the lead in providing new ideas for the project, and demonstrates insight into new approaches for achieving project goals; the student demonstrates flexibility and adaptability in the execution of the project, and recognizes the true implications of experimental outcomes and literature findings (whether positive or negative).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ethical conduct the student adheres to the highest standards of ethics in the execution of the project, including (but not limited to) data integrity and honesty in communication; rules regarding plagiarism and proper attribution are strictly observed in all products of the project.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	safe practice the student demonstrates a thorough knowledge of departmental safety policies, as well as the specific guidelines governing the lab(s) in which the research is conducted; proactive mitigation of potential safety risks is observed; experimental design considers potential hazards and the safety data sheets are consulted; students not performing lab work must demonstrate their thorough knowledge and awareness in conversations with their advisor and in the written proposal.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	lab citizenship the student is respectful of lab mates, prepared and punctual for meetings, and fosters an environment conducive to research and discussion.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	documentation and organization the laboratory notebook is clear and organized, conforming to the standards of the lab and containing all necessary information to reproduce the experiment and publish the results; literature notes include citations easily deciphered by future researchers; data files are named according to the standards of the lab and promptly & properly archived; a system of tracking data and samples is rigidly observed; rules for instrument sign-up are observed; literature is organized and easily accessible.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	growth ■ SPA 9 Intellectual Development substantial intellectual development is observed during the Senior Project

C. COMMUNICATION

					unsatisfactory	developing	proficient	exemplary	
	never	seldom	sometimes	often	almost always				
					Contributing factors to COMMUNICATION				
					<i>informal communication</i>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	results and priorities	the student takes initiative to communicate with the advisor about current results and project strategy.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	group communication	the student effectively communicates with other group members about logistical and scientific matters.			
					<i>formal written communication</i> ■ SPA 7 Written Communication				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	attention to audience	the document describes the project parameters and key findings in a manner that a non-specialist chemist can immediately comprehend; the background, results, and interpretation are presented in a way that would be useful to future senior project students working on the project.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	clarity, conciseness, and level of language	ideas are clearly expressed in appropriate terms avoiding unnecessary verbiage; the document is free from grammatical and other mechanical issues; the document conforms to all formatting standards of the relevant sub-discipline.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	figures	figures, charts, schemes, tables, etc., are well-constructed, informative, and persuasive.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	coherence of document	ideas follow in a logical progression with strong paragraph structure.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	appropriate evidence	literature evidence is drawn from reliable scholarly sources; findings are supported by appropriate experimental evidence.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	scientific arguments	arguments are coherent and connect evidence to scientific claims.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	synthesis of ideas	literature sources and scientific findings are presented as an interconnected whole rather than a collection of individual facts.			
					<i>formal oral communication</i> ■ SPA 8 Oral Communication				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	content	the experimental data and literature background are relevant and described clearly and accurately.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	visual aids	slides are visually attractive, organized, accurate and legible; visual elements effectively and efficiently convey key information.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	technical delivery	the presenter speaks clearly and confidently, making eye contact with the audience; adequate rehearsal is evident by smooth transitions and minimal use of notes.			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	response to questions	the presenter addresses questions from the reviewers in a manner that reveals intimate knowledge of the project and of general chemical principles.			

SPA Instrument

1. Disciplinary Proficiency

Students with excellent disciplinary proficiency demonstrate the depth and breadth of knowledge and skills necessary to complete independent, creative work in the discipline(s) in which the senior project is situated while adhering to the highest standards of quality and professional ethics.

2. Independent Project Planning and Development

Students who excel in planning and working independently require little guidance in identifying a specific, significant problem; proposing alternative methods for resolving the problem; designing an appropriate project to address the problem; working effectively within the context of the plan; and adjusting the plan as needed as more information becomes available.

3. Locating Information

Students who excel in locating information conduct a thorough yet not excessive search, locate a sufficient amount and appropriate range of source material for their project, and consult primary sources as needed.

4. Evaluation and Use of Information

Students who excel in the evaluation and use of information critically evaluate both the information and its sources, incorporate appropriate information into their work and interpret information to draw reasonable and defensible conclusions.

5. Integrative Thinking

Students with excellent integrative thinking skills carefully consider multiple perspectives, models and/or theories; synthesize and reconcile opposing arguments (when appropriate); and clearly present and justify their own perspective, model and/or theory.

6. Reasoning

Students who have excellent reasoning abilities activate prior knowledge in completing new tasks, express their reasoning and strategies for problem-solving, apprehend the implications of results or outcomes of their activities, seek to create coherent meaning from individual components, identify inconsistencies and confusion in their own thought processes, and are persistent in their quest for comprehension.

7. Written Communication

Excellent writing is clear, interesting, logically organized (both as a unified whole and within its constituent parts), concise and articulate. Assertions are specific, precisely stated, and persuasively supported. Arguments are carefully crafted and cohesive. The author employs the conventions and citation protocols of the discipline correctly. The document is free of the sorts of errors that careful proofreading catches.

8. Oral Communication

Excellent oral communication is clear, organized, interesting, and focused on a specific claim that is appropriate to the context. Assertions are specific, precisely stated, and persuasively supported. Arguments are carefully crafted and cohesive. Excellent oral communication is also characterized by consistent professionalism, sincerity, enthusiasm, and confidence.

9. Intellectual Development

During the period of time they spend completing the senior project, students develop to various degrees. In thinking about this student's senior project from start (e.g., pre-comp oral and/or initial proposal) to finish (e.g., final written version and/or oral defense/presentation), how would you rate this student's degree of intellectual development over the course of the senior project?