

Chemistry Graduate Program Candidacy Rubric

This rubric has three purposes: (1) we will use aggregate statistics to evaluate how well the program is doing at achieving key learning outcomes; (2) it will help students understand the expectations for a satisfactory performance on the candidacy exercise; and (3) it will help faculty committees evaluate candidacy exams fairly and uniformly.

After the exam is complete and the student is asked to leave the room, all members of the committee should fill out the rubric. This can then be used to frame the discussion on the exam's outcome.

The rubric can be turned in on paper by handing it to the student, or electronically via the link provided before the exam. Copies of the filled out rubric will be provided to the student and advisor.

Student _____

Advisor _____

Date of Exam _____

Committee Member Name _____

Candidacy Scoresheet*

Performance	Exceeds expectations	Meets expectations	Below expectations	Cannot evaluate
Mastered <i>foundational knowledge</i> of chemistry and the large subdiscipline of the work				
Demonstrates <i>in-depth knowledge</i> of the area of the oral exam proposal and dissertation work				
Demonstrates a knowledge of, and ability to critically evaluate, the <i>scientific literature</i> in the area of the proposal and dissertation work				
Developed and articulated testable, <i>compelling hypotheses</i> related to the dissertation work				
Designed and provided justification for <i>appropriate experiments</i> to test hypotheses related to the dissertation work				
Independently developed a compelling hypothesis and appropriate experiments to address it in an area outside of the student's research (<i>independent aim</i>)				
Wrote a proposal that is <i>readable and persuasive</i>				
Displays <i>effective oral communication</i> skills and responds to questions effectively during the exam				

*Please mark one box per performance. "Cannot evaluate" means that you do not have enough information from the written and oral parts of the candidacy exercise to make a judgement.

Performance	Exceeds	Meets	Below
Mastered foundational knowledge of chemistry and the large subdiscipline of the work	<ul style="list-style-type: none"> • Student is an authority in their large subdiscipline and has a broad knowledge of chemistry • There are no major gaps in knowledge • Level of knowledge is at or near what is expected for a senior graduate student 	<ul style="list-style-type: none"> • Student demonstrates understand of most fundamental concepts • Level of knowledge is clearly above a typical undergraduate but below that of a senior grad student 	<ul style="list-style-type: none"> • Student does not demonstrate understands of many key fundamental concepts • Level of knowledge is at or below a typical undergraduate student
Demonstrates in-depth knowledge of the area of the oral exam proposal and dissertation work	<ul style="list-style-type: none"> • Student is an authority in the area of the proposal and dissertation • Student demonstrates a command of key fundamental concepts as well as a detailed knowledge of the research area 	<ul style="list-style-type: none"> • Student is aware of and understands research in her own lab, but lacks knowledge about the broader area • Student understands fundamentals in the field but lacks detailed knowledge 	<ul style="list-style-type: none"> • Student is not even familiar with research in her own lab • Student lacks fundamental knowledge about the field • Advisor corrects the students several times about key facts related to the work
Demonstrates a knowledge of, and ability to critically evaluate, the scientific literature in the area of the proposal and dissertation work	<ul style="list-style-type: none"> • Student stays abreast of the literature and is aware of recent developments • Student is able to critical evaluate publications in a manner that approaches peer review 	<ul style="list-style-type: none"> • Student is familiar with key papers, but lacks knowledge of important details • Student is able to explain but not critique experiments in key papers 	<ul style="list-style-type: none"> • Student lacks familiarity with key papers in the field • Student is not able to explain experiments related to the work
Developed and articulated testable, compelling hypotheses related to the dissertation work	<ul style="list-style-type: none"> • The hypothesis is sound, testable, and addresses a key gap in the field • The hypothesis is based on evidence of literature or preliminary data • The hypothesis is a compelling as those in competitive NIH/NSF proposals 	<ul style="list-style-type: none"> • The hypothesis is reasonable and addresses an important question, but is not compelling enough for an NIH/NSF proposal • The question is a relatively minor extension of existing knowledge 	<ul style="list-style-type: none"> • The hypothesis is too simple and not based on a critical evaluation of the literature • The hypothesis could be proved or disproved from information already in the literature
Designed and provided justification for appropriate experiments to test hypotheses related to the dissertation work	<ul style="list-style-type: none"> • The experimental design addresses the question, and is creative and innovative • The line of investigation is highly compelling and will advance the field regardless of the outcome 	<ul style="list-style-type: none"> • The experimental design is reasonable, but lacks innovation or imagination • Student has provided some information on pitfalls and alternative approaches and has made a sound argument for the selected approaches 	<ul style="list-style-type: none"> • There are major flaws with the experimental design, or relies entirely on the most obvious approaches • The student is unable to articulate potential problems or alternative approaches, or cannot argue for the selected approaches

Performance	Exceeds	Meets	Below
<p>Independently developed a compelling hypothesis and appropriate experiments to address the hypothesis in an area outside of the student's research (independent aim)</p>	<ul style="list-style-type: none"> •An aspect of the proposal is creative and clearly outside of the student's and advisor's area of work •The question is compelling and the experiments will address it 	<ul style="list-style-type: none"> •The most independent parts of the proposal hew closely to the lab work and lack imagination •The question raised is not that compelling or the experiments proposed may not address them thoroughly 	<ul style="list-style-type: none"> •It is difficult to discern any aspect that is independent of the student's or advisor's work •The question raised is not interesting or the experiments proposed are wholly inadequate
<p>Wrote a proposal that is readable and persuasive</p>	<ul style="list-style-type: none"> •The written proposal is of the quality typical for a fundable fellowship proposal or peer reviewed publication •Text has been clearly edited, figures are understandable and well labeled, and citations are complete 	<ul style="list-style-type: none"> •The written proposal is of the quality typical for a submitted but not funded proposal •The text has some typos, illustrations have minor imperfections, or citations have errors 	<ul style="list-style-type: none"> •The written proposal is clearly below what is acceptable for a fellowship proposal submission •The text has grammar errors, typos, poor organization, problematic figures, or lacks citation information
<p>Displays effective oral communication skills and responds to questions effectively during the exam</p>	<ul style="list-style-type: none"> •The explanation of the proposal is clear, concise and well thought out •Student listens to questions and responds appropriately and correctly to most of them •The student is able to work through challenging questions logically and in a way that demonstrated deep understanding 	<ul style="list-style-type: none"> •The student describes the proposal accurately and it is possible to follow, but lacks clarity or precision •The student can answer basic questions, but cannot respond to more advanced or complex questions •The student has difficulty working through challenging or thought-provoking questions 	<ul style="list-style-type: none"> •The explanation of the proposal is difficult to understand •The student does not respond to questions directly •The student is unable to answer even many basic questions