

Student Learning Objectives for M.S. and Ph.D. Programs

Descriptive Rubrics

1. Integrated Knowledge of Biomedical Science

The candidate will demonstrate an appropriate level of knowledge of the current elements of the biomedical sciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

Exemplary - Student demonstrates ability to apply fundamental concepts to advanced topics in biomedical science and a command of the current research literature related to her or his area of research including the ability to relate the literature to the student's research product.

Acceptable - Student demonstrates ability to apply fundamental concepts to advanced topics in biomedical science and ability to relate the current research literature to her or his area of research.

Unacceptable - Student demonstrates knowledge of factual material limited to a level appropriate to a baccalaureate graduate in the sciences; knowledge of biomedical science related to the student's research area is unrelated to the current research literature.

2. Experimental Design

The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and / or create and implement experimental protocols and to design and develop experiments as measured by rubric.

Exemplary - Student displays ability to identify and select experimental protocols most appropriate to the research objective (may include the modification of established procedures); student displays appropriate technical ability to implement protocols for data acquisition.

Acceptable - Student displays appropriate ability to identify experimental protocols appropriate to the research objective; student displays appropriate technical ability to implement protocols for data acquisition.

Unacceptable - Student fails to recognize limitations in the design of experimental protocols that compromise their suitability for productive research; student displays limited ability to adopt protocol descriptions for experiment and data acquisition; student lacks the level of technical skill to safely pursue unsupervised experimental work.

3. Problem Solving Skills

The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in biomedical science research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.

Exemplary - Student consistently does the following in an appropriate fashion: identifies the appropriate reasons and claims (objective and hypothesis) related to the problem; accurately evaluates relevant information available including presentation of methodology, data reduction and presentation, reference citations, statements and questions, etc.; independently analyzes and evaluates the relation of the information to the reasons and claims, including (as appropriate) alternative explanations; draws warranted, non-fallacious and judicious conclusions; follows development of evidence to reasoned conclusion.

Acceptable - Student consistently does most of the following in an appropriate fashion: identifies the appropriate reasons and claims (objective and hypothesis) related to the problem; accurately evaluates relevant information available including presentation of methodology, data reduction and presentation, reference citations, statements and questions, etc.; analyzes the relation of the information to the reasons and claims, including (as appropriate) alternative explanations; draws warranted, non-fallacious conclusions; follows development of evidence to reasoned conclusion.

Unacceptable - Student does many of the following: misinterprets or inaccurately evaluates relevant information; fails to properly explain procedures and/or results as related to reasons and claims; does not appropriately evaluate clear alternative explanations; draws unwarranted or fallacious conclusions; does not link evidence or reasoned analysis to claims in an appropriate manner.

4. Oral Communication

The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.

Exemplary - Topic is well developed, effectively supported by relevant information; organization of presentation reflects creation of a well-structured framework; speaker displays consistent use of correct grammar and vocabulary and professional delivery, including eye contact and physical demeanor; visual materials are effective in supporting and enhancing the presentation; speaker addresses questions carefully and thoroughly, integrating additional information in responses.

Acceptable - Topics are adequately developed with inclusion of supporting materials; presentation is appropriately organized and is inclusive of aims and supporting information; speaker appears proficient in presentation skills though occasional flaws are present;

presentation is adequately paced with clear exposition and logical presentation; visual materials support points in the presentation; speaker addresses questions adequately.

Unacceptable - Topics are poorly developed with limited or poorly presented supporting details; presentation is unfocused with limited relationship of aims and supporting information; speaker displays inadequate/inappropriate use of vocabulary, eye contact, and posture; presentation appears unpracticed; visual materials poorly support points in the presentation; speaker fails to appropriately address questions.

5. Written Communication

The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.

Exemplary - Rules of grammar, syntax and spelling are consistently followed; vocabulary enhances communication of message; content is creatively organized with smooth transitions in the presentation of the message; use of figures and tables reflects an analysis of effective means of supporting message; citations are appropriately presented.

Acceptable - Rules of grammar, syntax and spelling are followed with minimal errors; use of vocabulary is appropriate; content is adequately organized to communicate message; presentation of figures and tables provides an enhancement of the message in the presentation; citations are appropriately presented.

Unacceptable - Document contains numerous grammar, syntax and spelling errors; use of vocabulary is inadequate; content is incomplete and / or inadequately organized to communicate message; presentation of figures and tables disjointed and confusing and / or displays absence / inappropriate use of citations.