**SAMPLE LEARNING OUTCOMES & RUBRICS**

**The following are sample program learning outcomes and rubrics to provide some guidance in the development of assessment standards. These are merely examples and can be modified to fit the needs of your program. The outcomes and measurements MUST be relevant and meaningful to your program, providing information that will be useful in continuing quality improvement. Remember, when developing of rubrics, consider the thresholds that will demonstrate PLO’s are being met.**

***Examples of Program Learning Outcomes***Some learning outcomes will require a rubric with perimeters for achievement, some will be percentage achievement, and still others may be designed as milestones completed (with time or percentage as unit measured). Ideally, your assessments will combine direct and indirect measures. The following are examples of some assessment ideas which are fairly typical of graduate assessment. Depending on your program, what works for you will vary, but most programs should address the following assessment themes:

***Demonstrate*** **Subject Content Knowledge (Generally in written or oral form, portfolio, project completion, or other demonstration of content knowledge)**

Demonstrate oral communication skills representative of their disciplinary field.

Demonstrate skills in oral and/or written communication sufficient to;

1. publish in a peer-reviewed journal
2. present work in their field
3. prepare grant proposals.

Demonstrate, through service, the value of their discipline to the academy and community at large.

Demonstrate a mastery of skills and knowledge at a level required for college and university undergraduate teaching in their discipline and assessment of student learning.

***Critical Thinking***Analyze and evaluate the literature relevant to their area of study.

Critically apply theories, methodologies, and knowledge to address fundamental questions in their primary area of study.

***Demonstrate knowledge progression***

*Develop* research objectives and hypotheses

*Collect, summarize and interpret*research data.

Pursue research of significance in the discipline or an interdisciplinary or creative project.

***Applications***Applyresearch theories, methodologies, and disciplinary knowledge to address fundamental questions in their primary area of study.

Produce and defend an original significant contribution to knowledge
Develop professional curriculum vitae with required skills to secure a profession position appropriate to their degree.

***Demonstrate Ethical Standards***

 Follow the principles of ethics in their field and in academia.

 Interact productively with people from diverse backgrounds as both leaders/mentors and team members with integrity and professionalism.
Be able to conduct scholarly activities in an ethical manner. Familiarly with guiding principles and strategies in the ethical conduct of research and/or teaching

Understand ethical issues and responsibilities especially in matters related to professionalism and (if applicable) in matters related the laboratory setting and in writing and publishing scientific papers.

**Measurement Examples**

The assessment of program-level learning outcomes should be formative, providing information on students as they work toward achieving required outcomes, and summative, determining satisfactory progress toward degree completion.

**Response Threshold (short list of examples)**

* At least 80% of students will be ranked at acceptable or exceptional in subject content knowledge, written communication, and oral communication skills. (Threshold based on rubric)
* At least 90% of students will pass their defense on their first attempt.
* 100% of students will successfully complete the ethics training and lab safety training.
* 90% of students will successfully complete foundation classes (those required by the department) with a grade of “B” or higher.
* By second year, 80% of graduate students will have participated in a Poster Presentation
* By their final year, 80% of students will have a published in a peer-reviewed journal
* Develop a sliding scale for students in different levels within the graduate program. 80% of students score at “mastery” level on department rubric.
* 80% of students will successfully complete courses specified in program of study by end of (period of time – will depend on nature of program, but time is a valuable measurement)
* 60% of Plan A grad students will submit final signed thesis by end of fifth semester.

Note: Rubrics must not be used to asses or evaluate individual students, and should not inform the decision regarding whether a student passes a defense or course. The data should be aggregated for all students in the program over a two-year period in order to assess the success of the program in meeting its program learning outcomes

**Use of Rubrics**
Rubrics are a more precise means of establishing student performance. Depending on the assessment measures for your program learning outcomes, they can be invaluable in seeing trends in the attainment of student achievement. The following are rubrics are from various sources, and they are certainly not the limit your option. The basic concept of a rubric is
1) The assessment outcome (what’s being assessed)
2) Levels of achievement (poor, limited, acceptable, and exceptional) between 4-5 levels are sufficient. Levels can be descriptive (as above), numerical (1-5), or a combination of both.

## **Sample Rubrics (Developed by CLS):**

**Rubric for the Assessment of Subject Content Knowledge**

|  |  |  |
| --- | --- | --- |
|  | **Level of Achievement** | Score |
|  | 1 | 2\* | 3 | 4\*\* | 5 |  |
| **Indicators of Subject Content Knowledge** | Little inquiry; limited knowledge shown |  | Explores topic with curiosity; adequate knowledge from variety of sources displayed |  | Knowledge base displays scope, thoroughness, and quality |  |
| **Examine & Identify the problem/question** | Does not identify or summarize the problem/ question accurately, if at all |  | The main question is identified and clearly stated |  | The main question and subsidiary, embedded or implicit aspects of a question are identified and clearly stated |  |
| **Analyzes & Synthesize:** Identifies & evaluates the quality of supporting data/evidence; detects connections and patterns | No supporting data or evidence is utilized; separates into few parts; detects few connections or patterns |  | Evidence is used but not carefully examined; source(s) of evidence are not questioned for accuracy, precision, relevance and completeness; facts and opinions are stated but not clearly distinguished from value judgments |  | Evidence is identified and carefully examined for accuracy, precision, relevance, and completeness; facts and opinions are stated and clearly distinguished; combines facts and ideas to create new knowledge that is comprehensive and significant |  |
| **Constructs & Interprets:** Identifies and evaluates conclusions, implications, & consequences; develops ideas | Combines few facts and ideas; needs more development; conclusions, implications; consequences are not provided |  | Accurately identifies conclusions, implications, and consequences with a brief evaluative summary; uses perspectives and insights to explain relationships; states own position on the question |  | Accurately identifies conclusions, implications, and consequences with a brief evaluative summary; uses perspectives and insights to explain relationships; states own position on the question |  |
|  |  |  |  |  | **Total** |  |

\*Exhibits most characteristics of ‘1’ and some of ‘3’; \*\*Exhibits most characteristics of ‘3’ and some of ‘5’

**Rubric for the Assessment of Written Communication**

|  |  |  |
| --- | --- | --- |
|  | Level of Achievement | Score |
| **Indicators of Effective Writing** | 1 | 2\* | 3 | 4\*\* | 5 |  |
| **Content & Development:** ideas, examples, reasons & evidence, point of view | Topic is poorly developed, support is only vague or general; ideas are trite; wording is unclear, simplistic; reflects lack of understanding of topic and audience; minimally accomplishes goals of the assignment |  | Topic is evident; some supporting detail; wording is generally clear; reflects understanding of topic and audience; generally accomplishes goals of the assignment |  | Thesis topic is clearly stated and well developed; details/wording is accurate, specific, appropriate for the topic & audience with no digressions; evidence of effective, clear thinking; completely accomplishes the goals of the assignment |  |
| **Organization:** focus, coherence, progression of ideas, thesis developed | Disorganized and unfocused; serious problems with coherence and progression of ideas; weak or non- existent thesis |  | Generally organized & focused, demonstrating coherence & progression of ideas; presents a thesis and suggests a plan of development that is mostly carried out |  | Clearly focused and organized around a central theme; thesis presented or implied with noticeable coherence; provides specific & accurate support |  |
| **Language:** word choice & sentence variety | Displays frequent & fundamental errors in vocabulary; repetitive words and sentence types; sentences may be simplistic and disjointed |  | Competent use of language and sometimes varies sentence structure; generally focused |  | Choice of language & sentence structure is precise & purposeful, demonstrating a command of language and variety of sentence structures |  |
| **Conventions:** grammar, punctuation, spelling, paragraphing, format; (as applicable) documentation | Errors interfere with writer’s ability to consistently communicate purpose; pervasive mechanical errors obscure meaning; inappropriate format; in text and ending documentation are generally inconsistent and incomplete; cited information is not incorporated into the document |  | Occasional errors do not interfere with writer’s ability to communicate purpose; generally appropriate format; in text and ending documentation are generally clear, consistent, and complete; cited information is somewhat incorporated into the document |  | Control of conventions contribute to the writer’s ability to communicate purpose; free of most mechanical errors; appropriate format; In text and ending documentation are clear, consistent, and complete; cited information is incorporated effectively into the document |  |
|  |  |  |  |  | **Total** |  |

\*Exhibits most characteristics of ‘1’ and some of ‘3’; \*\*Exhibits most characteristics of ‘3’ and some of ‘5’

**Rubric for the Assessment of Oral Communication**

|  |  |  |
| --- | --- | --- |
|  | Level of Achievement | Score |
| **Indicators of Effective Oral Communication** | 1 | 2\* | 3 | 4\*\* | 5 |  |
| **Subject Knowledge:** depth of content, relevant support, clear explanation | Provides irrelevant or no support: explanation of concepts is unclear or inaccurate |  | Main points adequately substantiated with timely, relevant and sufficient support; accurate explanation of key concepts |  | Depth of content reflects thorough understanding of topic; main points well supported with timely, relevant and sufficient support; provided precise explanation of key concepts |  |
| **Organization:** Main points distinct from support, transitions, coherence | Lack of structure; ideas are not coherent; no transitions; difficult to identify introduction, body, and conclusions |  | Clear organizational pattern; main points are made clearly; smooth transitions differentiate key points |  | Effective organization well suited to purpose; main points are clearly distinct from supporting details; transitions create coherent progress toward conclusion |  |
|  |  |  |  |  | **Total** |  |

\*Exhibits most characteristics of ‘1’ and some of ‘3’; \*\*Exhibits most characteristics of ‘3’ and some of ‘5’

Examples provided by Animal Science and Range Management:
**Rubric for Assessment of: Effectiveness in written communication of substantive content.**

**4 = Exceeds Standards: Student demonstrates competent performance exceeding normal standards at either the M.S. or Ph.D. level.**

**3 = Meets Standards: Student demonstrates appropriate performance for**

**professionalization**

**2 = Below Standards: Student does not demonstrate the skills commensurate with M.S. or Ph.D. degree.**

**1 = Unacceptable: Performance is clearly inadequate. Student demonstrates an inability or unwillingness to develop appropriate skills**.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Indicators of Effective Written Communication of Substantive Content | 1 | 2 | 3 | 4 | Score |
| Style / Organization | Paper is poorly written and reveals a lack of effort suitable for a graduate student | Paper conveys appropriate ideas, but reveals weak control over diction, syntax, and organization.  | Effective command of sentence structure and diction. Paper is organized in a logical scientific manner | Excellent command of sentence structure, diction, andorganization is appropriate for subject matter content |  |
| Content | Major omissionsnecessary for scientific paper. | Some necessary components of an effective paper missing or poorly described. | Good job presenting ideas; contains all necessary content for scientific paper, but not as clear or succinct as it could be. | Clearly presents appropriate justification, objectives and methods; If available, results are complete and inferences follow from the data |  |
| Grammar | Weak grammar, spelling | Several grammar and spelling errors | Few spelling and grammar errors | No spelling or grammar mistakes |  |
| Sources | Poorly sourced | Some major relative literature not covered | Major relative literature discussed | Exhaustive literature presented |  |

**Rubric for Assessment of: Effectiveness in oral communication of substantive content.**

**4 = Exceeds Standards: Student demonstrates competent performance exceeding normal standards at either the M.S. or Ph.D. level.**

**3 = Meets Standards: Student demonstrates appropriate performance for professionalization**

**2 = Below Standards: Student does not demonstrate the skills commensurate with M.S. or Ph.D. degree.**

**1 = Unacceptable: Performance is clearly inadequate. Student demonstrates an inability or unwillingness to develop appropriate skills.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Indicators of Effective Oral Communication of Substantive Content | 1 | 2 | 3 | 4 | Score |
| Organization | Poor | Insufficient | Adequate | Presentation is arranged logically |  |
| Content | Omission of critical information necessary for a scientific presentation | Missing key components of effective presentation | Most components covered, but talk would benefit from additional information | Material presented was complete and appropriate, all key components covered |  |
| Clarity | Study justification, objectives, and methods unclear; demonstrated lack of preparation | Slides poorly arranged or improperly formatted. Font size too small, too crowded, inappropriate color scheme, overuse of acronyms and jargon | Presentation is relatively clear; some slides too busy or lacking; visual aids are well designed, legible, with appropriate content | Presentation is succinct and clear; avoids jargon and acronyms; visual aids are well designed, legible, with appropriate content |  |
| Knowledge & Understanding | Demonstrates poor knowledge of the materials presented | Demonstrates a lack of knowledge in critical components of the study (e.g., literature, study design, analyses) | Demonstrates solid understanding of the topic and associated literature; highlights important points where study is strongest; delivers effective conclusion | Demonstrates a superb grasp of the topic and the literature related to the topic; well prepared for questions; Revisits important and relative points |  |
| Delivery | Obvious ill-preparedness | Ineffective delivery; poor speech mechanics; nervous habits interfered with effective presentation | Effective delivery; appropriate volume, few nervous habits, relatively little reliance on notes; evidence of preparation | Outstanding delivery; engagement with audience, little reliance on notes, smooth transitions |  |

Examples provided by Department of Chemistry and Biochemistry
Response Threshold All programs:

•At least 80% of students will be ranked at the level of exceptional

in subject content knowledge, written communication, and oral communication.

•At least 90% of students will pass their defense on their first attempt.

•100% of students will successfully complete the ethics training and lab safety training.

|  |
| --- |
| **Presentation:** *The student has effective oral communication skills.* |
|  | Unacceptable | Acceptable | Exceptional |
| Organization of the presentation |  |  |  |
| Clarity of the presentation |  |  |  |
| Effective use of slides and/or other visual aides |  |  |  |
| Demonstration of appropriate level of subject knowledge |  |  |  |
| **Thesis:** *The student has effective written communication skills.* |
|  | Unacceptable | Acceptable | Exceptional |
| Organization of the thesis: focus, coherence, progression of ideas is appropriate |  |  |  |
| Clarity of the thesis: Language word choice and grammar conventions are appropriate. |  |  |  |
| Content: Subject vocabulary , development of ideas, examples, and reference citations are at appropriate level. |  |  |  |
| **Thesis and Presentation:** *The student demonstrated mastery of subject content and successfully conducted independent research and analysis, contributing substantive work, in their field.* |
|  | Unacceptable | Acceptable | Exceptional |
| Identified and articulated the problem/hypothesis of the research project. | Unable to identify problem on their own. | Identified the problem but had some ambiguity in articulating the problem statement. | Identified the problem and outlined the necessary objectives to solve the problem.  |
| Conducted research to test the hypothesis. | Not clearly able to design an effective protocol. | Designed an effective protocol including appropriate control experiments. | Designed effective protocolsincluding appropriate control experiments and independently identified follow­‐up experiments. |
| Analyzed data and detected connections and patterns. | Not able to independently analyze data | Independently analyzed data and detected some appropriate connections and patterns. | Independently analyzed data and thoroughly detected connections and patterns. |
| Drew conclusions, implications, and consequences; developed ideas. | Combines few facts and ideas, needs more development, conclusions and consequences are not provided.  | Accurately identifies conclusions, implications and consequences with a brief evaluative summary. | Accurately identifies conclusions, implications, and consequences with a well-­‐developed explanation.Provides objective analysis of own assertions. |