

*Assessment Plan*

2008

**Mission:**

The mission of the Biology Department is to lead students to understand and appreciate the diversity and complexity of biological systems and to develop in them learning skills that will carry over into their professional lives. Through class, lab, and research, our students develop skills in observation, critical inquiry, problem solving, data analysis, and communication. Our curriculum integrates all components of biology, which are unified and explained by evolutionary processes and principles.

**Goals and Outcomes for Biology majors:**

*Goal 1. Demonstrate a breadth of knowledge about biological systems – integrating concepts and information from the study of evolution, ecology, organisms, cells and molecular biology.*

Outcome 1. Students demonstrate an understanding of basic biological principles, including principles of natural selection and evolution, organismal classification and phylogeny, adaptations to diverse habitats, physiological basis of homeostasis, cell structure and function, and molecular mechanisms.

*Goal 2. Develop critical thinking skills.*

Outcome 2. Students are able to summarize and critique a scientific article orally and in writing.

Outcome 3. Students are able to develop and present biological theses orally and in writing.

Outcome 4. Students are able to distinguish between peer-reviewed scientific research supported by appropriate evidence and non-scientific, genetic or non-peer reviewed discussions of biological systems.

*Goal 3. Demonstrate an understanding of the practice of Biology, including the scientific method and ethical research conduct.*

Outcome 5. Students can prepare lab reports in appropriate scientific format, including a clearly stated hypothesis, experimental approach, collected data and data analysis, and interpretation of results.

Outcome 6. Students have a firm grasp of ethical rules of conduct in scientific research and applications, including academic ethics and social ethics.

Outcome 7. Students are able to design an experiment, including a clear hypothesis, appropriate experimental approach, collect data, and analyze the data.

*Goal 4. Develop proficiency in using tools necessary for the practice of the biological sciences.*



	marine fishes									
369	Biological oceanography	M	M	M	M	M	M	M	M	M
377	Conservation ecology		D-M	D-M	D-M		M	D-M	D-M	D-M
378	Animal behavior	M	M	M	M	M	M	M	M	M
380	Plant physiological ecology	M	M	M	M	M	M	M	M	M
490	Senior seminar	M	M	M	M	M	M	M	M	M

**Implementation of Assessment**

Our timeline for completion of our assessment is as follows:

Academic Years			
2007-2008	2008-2009	2009-2010	2010-2011
Analysis of the rubric itself and outcome 3	Outcomes:1, 2 and 4	Outcomes:5, 6 and 7	Outcomes:8 and 9

The faculty in the Biology department have an active and ongoing participation in all phases and stages of the assessment plan. To further ensure that assessment results are reported and incorporated into the departmental strategic planning, the overall dynamic work structure is as follows:

1. Plan: a. Identify goals, and b. Identify specific outcomes for each goal;
2. Implement: a. Select assessment methods and adequate measures for each outcome, and b. Develop performance criterion for goals and objectives;
3. Assessment: a. Collect data, and b. Analyze and interpret data;
4. Report and Revise: a. Report findings to appropriate constituents, b. Initiate appropriate changes, and c. Incorporate feedback, considerations, revisions and reports for the new following assessments.

Weekly faculty meetings have been held in order to work on items 1, 2 and 3a. An Assessment Committee, made up by the chair, two faculty members and one staff, is following up the other parts of the process: 3b. and 4.

The need of first assessing the rubric itself has become our priority. Since a variety of oral presentation rubrics are used, we have realized the importance of analyzing the rubric itself in terms of how helpful a tool it is in order to have common departmental tools that would be consistent enough to assure that student learning is being properly addressed across the curriculum. Technical and scientific disciplines such as Business, Engineering, and Biology have begun to recognize and explore the role of oral performance in their curricula (Dunbar, Brooks, and Kubica-Miller, 2006).

Oral presentation rubrics have been collected from the 100 level courses to the 490 senior seminar course. Other pertinent materials such as examples of graded oral presentations, course syllabi that

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include a copy of oral rubric have been also collected and are being review by the Assessment Committee. The examples of material review for 2007-2008 are:

- For analysis of rubrics and its performance tasks, rubrics from the following courses: 115, 130, 240, 275, 279, 356, 369, 380, and five different rubrics of 490.

- For outcome 3:

<i>Introductory level</i> (Courses: 100, 105, 115, 130)	<i>Developmental level</i> (Courses: 240, 270, 275, 279, 320, 344)	<i>Mastery level</i> (Courses: 322, 333, 340, 356, 369, 377, 378, 380, 490)
Course syllabi, oral presentation rubrics, laboratory project guidelines, feedback comments of oral presentations and graded rubrics	Course syllabi, oral presentation rubrics, feedback comments of oral presentations and graded rubrics	Course syllabi, oral presentation rubrics, feedback comments of oral presentations, graded rubrics, and comparison of a 14-element-of-assessment rubric versus a 5-element rubric

### Description of the Process

During our weekly faculty meetings, we have discussed the importance of oral rubrics as an critical tool that reflects on the learning process inside the classroom and at large as part of the curriculum of our discipline. This is an important matter because the curriculum is the under purview of the faculty and it is our responsibility. Assessing our departmental oral rubrics is a milestone in our efforts to create common departmental tools that will strengthen and improve student oral skills, and therefore, student learning.

In order to ensure that appropriate oral skills are being developed across the curriculum, we have created one broad rubric that is very descriptive and can be used for both individual and group presentations across the curriculum. The following sources were used for the creation of the rubric:

Allen, M. J. (2004). *Assessing Academic Programs in Higher Education*. Bolton, MA: Anker.

Center for Teaching Effectiveness. University of Delaware. (2007). *Assessment and Evaluation*. Retrieved March, 3, 2008 from <http://cte.udel.edu/eval.htm>.

Center for Teaching, Learning, and Assessment. Indiana University –Kokomo. (2005). *Links to Educational Resources about Rubrics*. Retrieved March, 3, 2008 from <http://www.iuk.edu/~koctla/assessment/rubrics.shtml>.

Department of Computer Science and Engineering. Ohio State University. (2008). Rubric for Assessment of Oral Communication Skills (for Individual Presentations). Retrieved March, 12, 2008 from <http://www.cse.ohio-state.edu/~neelam/abet/DIRASSMNT/oralPresRubric.html>.

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Department of Computer Science and Engineering. Ohio State University. (2008). Rubric for Assessment of Oral Communication Skills (for Team Presentations). Retrieved March, 12, 2008 from <http://www.cse.ohio-state.edu/~neelam/abet/DIRASSMNT/oralTeamPresRubric.html>.

Dunbar, N. E., Brooks, C. F., and Kubica-Miller, T. (2006). Oral Communication Skills in Higher Education: Using a Performance-Based Evaluation Rubric to Assess Communication Skills. *Innovative Higher Education*, 31, 115-128.

Hafner, J. C., and Hafner, P. M. (2003). Quantitative Analysis of the Rubric as an Assessment Tool: An Empirical Study of Student Peer-Group rating. *International Journal of Science Education*. December, 25, 1509-1528.

School of Education, University of Wisconsin-Stout. (2007-2008). *Rubrics for Assessment*. Retrieved February, 26, 2008 from <http://www.uwstout.edu/soe/profdev/rubrics.shtml#rubrictips>.

We based our rubric from the template of the School of Education, University of Wisconsin-Stout website.

In Fall 2007, one faculty volunteered to test two different oral presentation rubrics. One rubric had five elements, the one created by Dr. John Hafner (organization, persuasiveness, collaboration, delivery, and creativity), and the second one assessed fourteen detail elements (organization, references, time budget, thesis persuasiveness, defense of views, opposing views, assigned role, enunciation, grammar, modulation, gestures, use of visuals, insight, and approach).

He compared the two rubrics and found that the two methods consistently reached the same grade ( $n = 17$ ,  $P=0.47$ , see table). In other words, he was able to evaluate student performance with just 5 elements and get the same result as if he tracked 14 elements. The faculty also emphasized that Dr. Hafner's rubric also allowed him to play a more active role in the presentations since he was tracking fewer elements. The results of the study are shown in the following table:

	5 Elements	14 Elements	Difference
<b>Student 1</b>	97%	98%	1%
<b>Student 2</b>	99%	98%	1%
<b>Student 3</b>	93%	93%	0%
<b>Student 4</b>	95%	97%	2%
<b>Student 5</b>	93%	95%	2%
<b>Student 6</b>	89%	91%	2%
<b>Student 7</b>	83%	83%	0%
<b>Student 8</b>	95%	94%	1%
<b>Student 9</b>	85%	87%	2%
<b>Student 10</b>	91%	94%	4%

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<b>Student 11</b>	92%	93%	<b>1%</b>
<b>Student 12</b>	96%	96%	<b>0%</b>
<b>Student 13</b>	93%	96%	<b>2%</b>
<b>Student 14</b>	96%	97%	<b>1%</b>
<b>Student 15</b>	97%	97%	<b>0%</b>
<b>Student 16</b>	91%	91%	<b>1%</b>
<b>Student 17</b>	88%	91%	<b>3%</b>