

Bergen Community College Assessment Report for 2008-2010

Department/Program: Physical Sciences/Earth Sciences

Department Leader: Joan Tscherne

Liaison: Prof. Joshua Guttman

Assessment Project Coordinator (if not the Department Leader): Joseph Sivo

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Program(s), if applicable (AAS, Interdepartmental, etc.):

PHY-111

Mission/Goal statement of the department or program:

SEMESTER 1: Create the Assessment Plan

Goal or learning objective being assessed:

Students completing Astronomy, PHY-111, will be able to apply their knowledge of the structure, dimensions, and content of the universe in discussing the prospects for life elsewhere.

Relevant Core Competencies: (check as many as apply)

☒ Communication

☐ Civic Responsibility

☐ Interpersonal Skills

☒ Quantitative Reasoning

☒ Technological and Information Fluency

☐ Creativity and Aesthetic Appreciation

☒ Critical Thinking

☐ Personal Skills

☒ Applied Knowledge

Means of Assessment:

- On the final exam for the Astronomy PHY-111 course, students shall be required to define a set of astronomical terms related to the structure, dimensions, and content of the universe.
- On the final exam for the Astronomy PHY-111 course, a common essay question shall be asked as follows:

“Do you believe there is life elsewhere in the universe? Explain.”

The essay question will be graded using a faculty-developed rubric.

SEMESTER 2: Develop an Assessment Strategy

Criterion for success:

- 80% of the students will score 13/20 (13 points out of 20 points) or better on the astronomical terms on the final exam.
- 70% of the students will score 7/10 (7 points out of 10 points) or better on the essay question on the final exam.

- 70% of the students will score 2/3 (2 points out of 3 points) or better on the “Course Content” metric of the essay rubric on the final exam.
- 70% of the students will score 2/3 (2 points out of 3 points) or better on the “Astronomical Competency” metric of the essay rubric on the final exam.
- 70% of the students will score 2/4 (2 points out of 4 points) or better on the “Awareness” metric of the essay rubric on the final exam.

The astronomical terms to be defined on the final exam included five numbered sets of randomly chosen vocabulary words taken from a bank of 231 words spanning the entire course. Students will not know in advance which vocabulary words will appear on the final exam. Each set will include anywhere from two to five vocabulary words. Students are required to pick one vocabulary word from each numbered set and define it. The vocabulary word they chose to define is worth 4 points. Since there are five sets, this adds to a 20 points total potential score. If the student chooses more than one vocabulary word to define from each set, the additional word was worth 1 point extra credit. Finally, students are permitted to define as many of the 231 vocabulary words spanning the course that they can recall for ¼ point extra credit each. Extra credit points will be added to the total.

To grade the essay question on the final exam, for assessment purposes only, the following rubric is proposed:

Rubric for Astronomy Essay

Metric #1: Course Content Does student incorporate course material properly into his/her argument?	Metric #2: Astronomical Competency Does the student make proper use of astronomical terminology?	Metric #3: Awareness Does the student have a sense of the structure, dimensions and contents of the universe?
3 pts. Essay makes liberal use of course material, citing many examples to support argument.	3 pts. Essay makes competent use of astronomical terminology.	4 pts. Essay clearly demonstrates awareness of the contents and size scale of the universe.
2 pts. Essay incorporates limited material. May use one specific example rather than generalize. May be a few factual errors in examples.	2 pts. The essay incorporates some astronomical terminology. Essay may misuse some terminology.	2 pts. Essay demonstrates some understanding of the size scale of the universe. Essay may jump from discussion of solar system to other galaxies neglecting our galaxy.
1 pt. Essay lacks substantial course material. Essay may not argue from a scientific perspective and may resort to animism.	1 pt. Essay lacks astronomical terminology or includes substantial misuse of terminology.	1 pt. Essay lacks sense of size scale of the universe. Essay ignores context of our planet or solar system in relation to the universe. Essay may confuse solar system/galaxy/universe.

N/A Essay does not address this metric	N/A Essay does not address this metric	N/A Essay does not address this metric
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The data from the six sections of Astronomy PHY-111 that will be assessed will be presented as follows:

Astronomy PHY-111 Assessment Data

Astronomy Section	Number of Students	Metric #1 Success (>2/3)	Metric #1 Success %	Metric #2 Success (>2/3)	Metric #2 Success %	Metric #3 Success (>2/4)	Metric #3 Success %	Overall Essay Success (>7/10)	Overall Essay Success %	Vocabulary Success (>13/20)	Vocabulary Success %
003	19	14	74%	17	89%	14	74%	11	58%	5	26%
601	16	11	69%	13	81%	7	44%	7	44%	3	19%
004	20	13	65%	17	85%	17	85%	16	80%	18	90%
005	23	22	96%	21	91%	19	79%	18	78%	22	96%
001	24	15	63%	17	71%	17	71%	13	54%	23	96%
002	19	14	74%	13	68%	12	63%	12	58%	19	100%
Totals:	121	89	74%	98	81%	86	71%	77	64%	90	74%

The above table will keep the stats on the three essay metrics of the rubric separate, rather than lump them into a total essay score, that way we can better spot areas of weakness.

Dean's Comments: Who is the Assessment Project Coordinator? I think that your assessment plan covers the following additional core competencies: Quantitative reasoning, (written) Communication and Technology and Information Fluency. Excellent rubric designed for the essay.

VP's Comments:

SEMESTER 3: Implement Assessment Plan & Strategy

Summary and analysis of data collected:

In this assessment cycle, the implementation of the assessment was done differently for the various astronomy course sections.

For vocabulary assessment, students of sections 004, 005, 001 and 002 were given, prior to the exam, a reduced list of approximately 50 vocabulary words of the 231 vocabulary words spanning the course. Students of sections 003 and 601 were not given a reduced list of vocabulary words and instead were told to study all 231 vocabulary words in preparation for the exam.

For the essay assessment, students of sections 004 and 005 were provided specific details of the essay grading rubric prior to the assessment, including the three metrics of the rubric, namely “Course Content”, “Astronomical Competency” and “Awareness” as well what was being looked for in these metrics. Students of section 003 were provided only the names of the three rubric metrics, namely “Course Content”, “Astronomical Competency” and “Awareness” with no details as to what was being looked for. Students of sections 601, 001 and 002 were provided no information whatsoever as to how the essay would be graded.

Concerning the astronomical terms, as a cohort of students, 74% success indicates that the criterion for success was not met.

However, on a section-by-section basis, the sections 004, 005, 001 and 002 that were given the reduced list of vocabulary words to study from all met the criteria for success with all sections over 90% success. Sections 003 and 601 that were not given the reduced list did not met the criteria for success, with very low success rates of 26% and 19% respectively.

Concerning the essay question and overall essay success, as a cohort of students, 64% success indicates that the criterion for success was not met.

However, on a section-by-section basis, the sections 004 and 005 that were given details of the essay grading rubric easily met the criteria for success with 80% and 78% success respectively. Comparing sections 003 and 601, which were taught by the same instructor, one can see that section 003 that was provided just the name of the names of the three rubric metrics faired much better than section 601 which was provide no information concerning the rubric, with overall essay success of 58% and 44% respectively. Section 003 faired much better than section 601 for each individual metric as well.

(The Summary should appear here. Use attachments only to provide information to support the summary.)

SEMESTER 4: Reporting and Revising

Use of results:

Concerning vocabulary, it appears obvious that providing students with a reduced list of vocabulary words can ensure success.

Concerning the essay question, it appears that providing students with some prior knowledge of the essay grading metrics and/or additional details can dramatically improve essay success rates.

It is not clear if the above two assessment methodologies can be considered “teaching to the test” or rather can be considered just helping the students better organize their study time and thoughts.

Whether or not instructors choose to adopt the above two assessment methodologies is their prerogative.

Dean's Comments:
VP Comments: