Core Course Assessment Plan, 2018-19
Element 6: Natural Sciences

Please complete all sections; do not delete section information. Submit to Pilot when complete.

SECTION 1: GENERAL INFORMATION

Course Dept. Prefix: PHY Course #: 1060

Semester when assessment will occur: X Spring □ Summer □ Fall Year: 2018 or 2019

Course Title: Astronomy

Section Types and number of sections offered in 2018-19. Complete all that apply.

_____ Dayton face-to-face X Lake face-to-face
X Dayton online _____ Lake online
_____ Dayton Honors _____ Lake Honors

Attributes: _____ Integrative Writing in Core
_____ Multicultural Competency in Core
_____ Service Learning in Core

Dept. Core Assessment Lead: Jason Deibel jason.deibel@wright.edu

List at least two assessors; this may include course instructor only if there are multiple sections and multiple instructors of the course. Note - The instructor may not assess his/her students’ papers.

• Adrienne Traxler
• Eric Rowley
• Jerry Clark
• Sarah Tebbens

SECTION 2: ASSESSMENT PLAN

It is preferable to have the assessment plan for all sections of a course. If not feasible, please complete an assessment plan for separate sections.

Course Outcomes. ______ Check here if Outcomes have been modified.

The course must address all 5 outcomes but must assess a minimum of 1 outcome. Highlight in yellow the outcome(s) you will assess. If you have modified the outcomes, please insert here in place of standard outcomes.

1. Understand the nature of scientific inquiry;
2. Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources;
3. Distinguish between science and technology and recognize their roles in society;
4. Demonstrate an awareness of theoretical, practical, creative and cultural dimensions of scientific inquiry; and
5. Discuss fundamental theories underlying modern science.
Assignments. Select one of the options below for assessment of one or more outcomes

☐ Written assignment(s) that addresses/address outcome(s). Include outcome #, title and description for each assignment.

Outcome #: ______ Title:

Description of assignment:

☐ Essay question(s). Provide the question(s) and outcome(s) below.

1. Outcome #: ______ Essay Question:
2. Outcome #: ______ Essay Question:
3. Outcome #: ______ Essay Question:

☐ Pilot asynchronous written discussion that addresses outcome(s). Provide the outcome # and question(s).

1. Outcome #: _____ Discussion Question: _____________________________
2. Outcome #: _____ Discussion Question: _____________________________
3. Outcome #: _____ Discussion Question: _____________________________

X Multiple Choice or T/F Marker questions – 3 to 4 questions per outcome. List the outcome and question numbers. A rubric is not used for Marker questions. “All the above” should not be used as the correct answer more than once. Courses that are IW or SRV/ SRVI must use written assignments for those attributes. Complete the benchmark: We expect ___50___% of students to answer ___75___% of the question(s) correctly.

1. Outcome #: 2
   a) Question: If the Earth were twice as far from the Sun as it is now, the gravitational force between Earth and the Sun would be
      a) 2 times as great.  b) 4 times as great.  c) 0.5 times as great.  d) 0.25 times as great.
   b) Question: Tidal forces are caused by:
      a) the weight of the water in the oceans on the ocean floor
      b) the strength of the gravitation pull of the Moon on Earth
      c) the difference between the weight of the water on the ocean floor at high and low tide
      d) the difference between the strength of the gravitation pull of the Moon and Sun on either side of Earth
      e) the strength of the gravitation pull of the Moon and the Sun on Earth
   c) Question: Which of these observations would allow you to measure the mass of a planet?
      a) the planet’s orbital period
      b) the planet’s rotational period
      c) the planet’s distance from the Sun
      d) the orbit of one of that planet’s moons
      e) the planet’s temperature
   d) Question: The large atmospheric greenhouse effect on Venus is caused by
      a) ultraviolet radiation that penetrates to the surface.
      b) a thick atmosphere of carbon dioxide
      c) perpetual sulfuric acid rain.
      d) the slow rotation of Venus.

2. Outcome #: ____________
   a) Question: __________________________________________
Collecting and submitting the student assignment(s)

___ Will upload assignment(s) to Pilot  ___X___ Will give access to assignment(s) on Pilot

Other: __________________________________________________________

Rubric Selection (A, B). Select the items you feel best match your assignment(s) in the rubric(s) on the next pages. Please highlight in yellow. If this course has an IW attribute, please also see section B.

A. Element 6 Rubric. Select the item(s) you will use in your rubric by highlighting in yellow the item(s). You may select one or more of them. As there is overlap, choose the items that best fit the assignment you select for assessment. The items below are taken from the Association of American Colleges and Universities (AACU) Value Rubrics for Critical Thinking and Inquiry and Analysis.

**IF YOU ARE USING MARKER QUESTIONS FOR THE OUTCOME, DO NOT USE THIS RUBRIC.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Mastery 4</th>
<th>Partial Mastery 3</th>
<th>Progressing 2</th>
<th>Emerging 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AACU Critical Thinking VALUE Rubric Items</strong></td>
<td></td>
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<tr>
<td><strong>Explanation of issues</strong></td>
<td>Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.</td>
<td>Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.</td>
<td>Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.</td>
<td>Issue/ problem to be considered critically is stated without clarification or description.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.</td>
<td>Information is taken from source(s) with some interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.</td>
<td>Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.</td>
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</tr>
<tr>
<td>Item</td>
<td>Mastery</td>
<td>Partial Mastery</td>
<td>Progressing</td>
<td>Emerging</td>
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<tr>
<td>Influence of context and assumptions</td>
<td>Viewpoints of experts are taken as mostly fact, with little questioning.</td>
<td>Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.</td>
<td>Identifies own and others' assumptions and several relevant contexts when presenting a position.</td>
<td>Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).</td>
</tr>
<tr>
<td>Student's position (perspective, thesis/hypothesis)</td>
<td>Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis).</td>
<td>Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis).</td>
<td>Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.</td>
<td>Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.</td>
</tr>
<tr>
<td>Conclusions and related outcomes (implications and consequences)</td>
<td>Conclusions and related outcomes (consequences and implications) are logical and reflect student’s informed evaluation and ability to place evidence and perspectives discussed in priority order.</td>
<td>Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.</td>
<td>Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.</td>
<td>Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.</td>
</tr>
<tr>
<td><strong>AACU Inquiry and Analysis VALUE Rubric Items</strong></td>
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<tr>
<td><strong>Topic selection</strong></td>
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<tr>
<td>Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.</td>
<td>Identifies a focused and manageable(topic that appropriately addresses relevant aspects of the topic.</td>
<td>Identifies a topic that while manageable/doable, is too narrowly focused and leaves out relevant aspects of the topic.</td>
<td>Identifies a topic that is far too general and wide-ranging as to be manageable and doable.</td>
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<tr>
<td><strong>Existing Knowledge, Research, and/or Views</strong></td>
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<tr>
<td>Synthesizes in-depth information from relevant sources representing various points of view/approaches.</td>
<td>Presents in-depth information from relevant sources representing various points of view/approaches.</td>
<td>Presents information from relevant sources representing limited points of view/approaches.</td>
<td>Presents information from irrelevant sources representing limited points of view/approaches.</td>
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<tr>
<td><strong>Design Process</strong></td>
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<tr>
<td>All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant sub disciplines.</td>
<td>Critical elements of the methodology or theoretical framework are appropriately developed, however, more subtle elements are ignored or unaccounted for.</td>
<td>Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused.</td>
<td>Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.</td>
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<tr>
<td><strong>Analysis</strong></td>
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<tr>
<td>Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.</td>
<td>Organizes evidence to reveal important patterns, differences, or similarities related to focus.</td>
<td>Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.</td>
<td>Lists evidence, but it is not organized and/or is unrelated to focus.</td>
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</tr>
<tr>
<td><strong>Conclusions</strong></td>
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<tr>
<td>States a conclusion that is a logical extrapolation from the inquiry findings.</td>
<td>States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.</td>
<td>States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.</td>
<td>States an ambiguous, illogical, or unsupportable conclusion from inquiry findings.</td>
<td></td>
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<tr>
<td><strong>Limitations and Implications</strong></td>
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<tr>
<td>Insightfully discusses in detail relevant and supported limitations and implications.</td>
<td>Discusses relevant and supported limitations and implications.</td>
<td>Presents relevant and supported limitations and implications.</td>
<td>Presents limitations and implications, but they are</td>
<td></td>
</tr>
</tbody>
</table>
B. If this is an IW course, you will use the items on this page. You may select one or more of them. Please highlight in yellow.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mastery</th>
<th>Partial Mastery</th>
<th>Progressing</th>
<th>Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</td>
<td>Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.</td>
<td>Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).</td>
<td>Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).</td>
<td>Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).</td>
</tr>
<tr>
<td>Content Development</td>
<td>Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.</td>
<td>Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.</td>
<td>Uses appropriate and relevant content to develop and explore ideas through most of the work.</td>
<td>Uses appropriate and relevant content to develop simple ideas in some parts of the work.</td>
</tr>
<tr>
<td>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</td>
<td>Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task(s) including organization, content, presentation, formatting, and stylistic choices</td>
<td>Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices</td>
<td>Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation</td>
<td>Attempts to use a consistent system for basic organization and presentation.</td>
</tr>
<tr>
<td>Sources and Evidence</td>
<td>Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing</td>
<td>Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.</td>
<td>Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.</td>
<td>Demonstrates an attempt to use sources to support ideas in the writing.</td>
</tr>
</tbody>
</table>
Control of Syntax and Mechanics

- Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.
- Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.
- Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.
- Uses language that sometimes impedes meaning because of errors in usage.

SECTION 3: UCRC COMMITTEE REVIEW ONLY. DO NOT delete this section.

<table>
<thead>
<tr>
<th>Item</th>
<th>Complete / NA / Revision Requested</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Outcomes for Element 6 Natural Science</td>
<td></td>
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<tr>
<td>Assignments matched to Element 6 LOs</td>
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<tr>
<td>Rubric for LOs</td>
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<tr>
<td>Rubric for IW Attribute</td>
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<tr>
<td>Assigned Approved Reviewers</td>
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</tbody>
</table>

Committee Review Completed □

Committee Chair Signature ____________________________ Date __________________

PHY 1060 Core Assessment Element 6 Report

Date Report Submitted: 01 October 2019

Element: Core Element 6 – Natural Science

Academic Year: 2018-2019

Course and Sections Assessed: PHY 1060 - 90

Assessment Plan:

The course must address all 5 outcomes but must assess a minimum of 1 outcome. Highlight in yellow the outcome(s) you will assess. If you have modified the outcomes, please insert here in place of standard outcomes.

1. Understand the nature of scientific inquiry;
2. Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources;
3. Distinguish between science and technology and recognize their roles in society;
4. Demonstrate an awareness of theoretical, practical, creative and cultural dimensions of scientific inquiry; and
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**X** Multiple Choice or T/F Marker questions – 3 to 4 questions per outcome. List the outcome and question numbers. A rubric is not used for Marker questions. “All the above” should not be used as the correct answer more than once. **Courses that are IW or SRV/SRVI must use written assignments for those attributes.** Complete the benchmark: We expect __50___% of students to answer _75___% of the question(s) correctly.

### 4. Outcome #: 2

a) Question: If the Earth were twice as far from the Sun as it is now, the gravitational force between Earth and the Sun would be
   - a) 2 times as great.
   - b) 4 times as great.
   - c) 0.5 times as great.
   - d) 0.25 times as great.

b) Question: Tidal forces are caused by:
   - a) the weight of the water in the oceans on the ocean floor
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c) Question: Which of these observations would allow you to measure the mass of a planet?
   - a) the planet’s orbital period
   - b) the planet’s rotational period
   - c) the planet’s distance from the Sun
   - d) the orbit of one of that planet’s moons
   - e) the planet’s temperature

d) Question: The large atmospheric greenhouse effect on Venus is caused by
   - a) ultraviolet radiation that penetrates to the surface.
   - b) a thick atmosphere of carbon dioxide
   - c) perpetual sulfuric acid rain.
   - d) the slow rotation of Venus.

### Collecting and submitting the student assignment(s)

_____ Will upload assignment(s) to Pilot  ____X____ Will give access to assignment(s) on Pilot

**Assessment plan summarized above. No changes compared to approved plan.**

**Assessment Data Collection:**

100 students completed the assessment out of a total of 164 registered students. Assessment was scored on a 0 to 4 scale, with 1 point per question.
Assessment Results:

<table>
<thead>
<tr>
<th>Score</th>
<th>Number of students with score</th>
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<tbody>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>41</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
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</tbody>
</table>

Our benchmark was to achieve 50% of students achieving 75% of questions correctly. The results above indicate that 45/100 or 45% of students answered 75% of the questions, so we fell just short of the benchmark.

Assessment Feedback:

These assessment results were shared verbally with the instructor, and via this report to the department chair.

We do not plan any changes to the course or the assessment plan at this time.

These results will be shared with the undergraduate curriculum committee at a Fall 2019 undergraduate curriculum committee meeting.

Assessment Administration Feedback

No recommended changes.

UCOC Report Review

<table>
<thead>
<tr>
<th>Item</th>
<th>Complete/NA</th>
<th>Revision Requested</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identified Outcome Assessed</td>
<td>XX</td>
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<tr>
<td>Identified Procedure for Assessment</td>
<td>XX</td>
<td></td>
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<tr>
<td>Summary of Results</td>
<td>XX</td>
<td></td>
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<tr>
<td>Results Shared with Instructor, Dept Curriculum Committee, etc.</td>
<td>XX</td>
<td></td>
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<tr>
<td>Plan for Improvements</td>
<td>XX</td>
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</tbody>
</table>

Committee Review Completed XXX

Committee Chair Signature ___ Dr. Ann M. Bowling _________ Date _ 10/7/2022_________