Boise State University
Foundational Studies Program Course Application Form
Due to the Foundational Studies Program by August 19, 2011

After the Foundational Studies Program has approved a course, departments will continue through the regular department and college procedures. The approved course should be submitted to the University Curriculum Committee by October 1, 2011.

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Instructions:

1. Complete one form per course.
2. Attach this Foundational Studies Course Application Form to the back of the University Curriculum Committee “Request for Curriculum Action” form. Both forms should be submitted to the Foundational Studies Program Office by August 19, 2011.

Part I. Course Information

<table>
<thead>
<tr>
<th>Course Number and Title: PHYS 105: Stars and Cosmology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Foundational Studies Course – (Choose One):</td>
</tr>
<tr>
<td>[ ] DLS (Disciplinary Lens – Social Science)</td>
</tr>
<tr>
<td>[ ] DLL (Disciplinary Lens – Literature and Humanities)</td>
</tr>
<tr>
<td>[ ] DLV (Disciplinary Lens – Visual and Performing Arts)</td>
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<tr>
<td>[ ] DLM (Disciplinary Lens – Mathematics)</td>
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<tr>
<td>[x] DLN (Disciplinary Lens – Natural, Physical, and Applied Sciences)</td>
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<tr>
<td>Includes Lab: [x] Yes [ ] No</td>
</tr>
<tr>
<td>[ ] CID (Communication in the Discipline)</td>
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<tr>
<td>[ ] FF (Finishing Foundations)</td>
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</tbody>
</table>

Delivery Format(s) – (Check all that apply):

| [x] Face to Face                                       |
| [ ] Fully Online                                       |
| [ ] Hybrid                                             |
| [ ] Concurrent Enrollment                              |
| [ ] Other (briefly describe):                          |
Part II. Syllabus Statement

Boise State's Foundational Studies Program provides undergraduates with a broad-based education that spans the entire university experience. PHYS 105 satisfies 4 credits of the Foundational Studies Program's Disciplinary Lens – Natural, Physical and Applied Science requirements. It supports the following University Learning Outcomes, along with a variety of other course-specific goals.

ULO 8. Apply knowledge and methods characteristic of scientific inquiry to think critically about and solve theoretical and practical problems about physical structures and processes.

PHYS 105: Stars and Cosmology is designed to develop an understanding of the nature and lifecycles of stars and larger scale structures including the entire universe. This course helps to achieve the goals of the Foundational Studies Program by focusing on the following course learning outcomes.

After successful completion of this course, you will be able to:

- Understand the basic physics of stars and relate their evolution to observable patterns
- Develop an appreciation of the uses of light as an information carrier
- Have a good understanding of how the cosmological distance scale is established, and relate to cosmological models
- Become familiar with current theories about the origin and future of hierarchical structures from galaxies to the universe as a whole

Part III. Design for Accessibility

In the space below, briefly describe plans for providing access to course materials and activities (or equivalent alternatives) to all students in adherence with the Americans with Disabilities Act. Although these plans may vary from instructor to instructor, the descriptions provided below should be representative of intended departmental and instructor practices. (See example statements appended to this form.)

PHYS 105: Stars and Cosmology: All instructors are committed to working with the university's Disability Resource Center (DRC) to meet the needs of students with documented disabilities. Students that feel they may need accommodations will be met with privately, and steered to the DRC for further coordination. Approved accommodations may include (but are not limited to): checking pdf reading assignments for readability by a screen reader, videos chosen for use in the course will be those that have been close-captioned by the content producer to provide access to students with hearing impairment, graphics in PowerPoint presentations used in class lectures will be verbally described to students on an as-needed basis, providing textual descriptions accessible by screen readers to images used on the course web site, extra time on tests and oral examinations, or other accommodations.
Part IV. Evidence of Quality Course Design

Please use the table below (column headings for this table should not be changed) to provide evidence that the course has been carefully designed and is clearly aligned with Foundational Studies Program desired ULOs. All sections of the course should share similar student learning outcomes. Teaching and Learning Activities and Assessment Methods may vary from instructor to instructor. Please use the table to report representative strategies that may be used. Assessment activities used for reporting to the Foundational Studies Program should be consistent across different sections of the course.

Please see below.
Boise State University  
Foundational Studies Course  
Spring 2014  

Course Number and Title: **PHYS 105: Stars and Cosmology**

## Course Design Table

<table>
<thead>
<tr>
<th>Foundation ULO 8 Criteria</th>
<th>Foundation ULO 8 Notions of Exemplary Work</th>
<th>Course Learning Outcomes: By the end of this course, each student should be able to...</th>
<th>Assessment Method: Evidence of Student Learning</th>
<th>Planned Teaching &amp; Learning Activities / Pedagogy</th>
</tr>
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<tbody>
<tr>
<td>ULO 8.1: Process of Inquiry and Analysis in Response to Evidence or Observation</td>
<td>Skillfully and thoroughly formulates a research question or testable hypothesis</td>
<td>Use appropriate sources of evidence for determining the motions and positions of astronomical objects</td>
<td>* Exams&lt;br&gt;  * Lab reports&lt;br&gt;  * In-class activities&lt;br&gt; (Report: distribution of scores on multiple choice exam questions, exams #1 and #2)</td>
<td>Labs:&lt;br&gt;  * Diurnal Motion lab&lt;br&gt;  * Stellar Distances lab&lt;br&gt;  * Hubble's Law lab&lt;br&gt;  * Proper Motions Lab&lt;br&gt;  * In-class activities in which students consider the concept of parallax&lt;br&gt;  * Lecture material&lt;br&gt;  * Assigned reading</td>
</tr>
<tr>
<td>ULO 8.1: Process of Inquiry and Analysis in Response to Evidence or Observation</td>
<td>Constructs a model to test evidence and observations</td>
<td>Develop a coherent story for the lifecycles of stars based upon evidence compiled from a large number of astronomical objects and an understanding of the underlying physics</td>
<td>* Exams&lt;br&gt;  * Lab Reports&lt;br&gt; (Report: distribution of scores on multiple choice or concept mapping exam question)</td>
<td>* HR Diagram lab&lt;br&gt;  * Observing lab&lt;br&gt;  * Lecture material&lt;br&gt;  * Assigned reading</td>
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| **ULO 8.1: Process of Inquiry and Analysis in Response to Evidence or Observation** | Skillfully uses model to either confirm existing explanations or formulate new hypotheses | Become familiar with current theories about the origin and future of hierarchical structures from galaxies to the universe as a whole | * Exams  
* Lab reports  
* In-class activities (Report: distribution of scores on multiple choice or concept mapping exam question) |  
* Milky Way lab  
* Local galaxies lab  
* Large scale structure lab  
* Lecture material  
* Assigned reading |
| **ULO 8.2: Understanding of Knowledge and Inquiry** | * Clearly understands the difference between evidence (data) and explanation (theory)  
  * Is able to connect evidence & explanation to build an argument  
  * Understands the role of these kinds of arguments in building knowledge in the discipline | * Describe the characteristics and uses of electromagnetic radiation; Use electromagnetic signatures as evidence in the exploration of astronomical objects  
  * Understand how the cosmic distance scale works and relate to the physical phenomena involved | * Exams  
* Lab reports (Report: distribution of scores on multiple choice exam questions, exams #1 and #2 or multiple choice concept mapping exam questions) | Labs:  
* Spectral Classification lab  
* Telescope Lab  
* Stellar Distances Lab  
* Proper Motions lab  
* HR Diagram lab  
* Stellar Distances Lab  
* Hubble’s Law lab  
* Lecture material  
* Assigned reading |
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</table>
| ULO 8.3: Communication of Scientific and/or Technological Understandings | * Produces clear, accurate, well-organized written and oral communications about scientific and technological understandings  
* Use of scientific language, representational tools, and notation covered in the course is skillful. | Create and interpret graphs and plots; use appropriate scientific terminology in written descriptions and explanations | * Lab reports  
* Exams  
(Report: distribution of student success in graph creation and terminology usage on lab report #13 – Hubble's Law, alternatively distribution of responses on a multiple choice exam question) | * All labs  
* Lecture material  
* Assigned reading |
| ULO 8.4: Understanding of interactions of science and technology with humans and environment | * Skillfully assesses the potential connection of scientific and/or technological developments to humans and the environment  
* Able to articulate possible implications of these relationships | Be able to distinguish the requirements for a scientific model for the development of the universe and understand any potential limits of this knowledge. | * Exams  
* Lab reports  
* Activity assignment  
(Report: distribution of student scores on a multiple choice questions on Exams 4 or 5) | * Lecture material  
* Assigned reading |

5-16-2013

Foundational Studies Program Director Signature  
Date  

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