

# **Course Student Learning Outcomes Assessment**

**ASTR 140 Astronomy Laboratory**

**Created on: 09/11/2013 01:22:00 PM PST  
Last Modified: 08/20/2015 10:03:38 AM PST**

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## **General Information (Course Student Learning Outcomes Assessment)**

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# Standing Requirements

## Course Description

Utilizes experimental techniques to explore and comprehend properties and motions of celestial objects. Basic naked-eye binocular and small telescope observing techniques will be introduced. Field trips to local planetaria and dark sky locations may be included.

## Course Student Learning Outcomes

### ASTR 140 Astronomy Laboratory Outcome Set

Outcome	
Outcome	Mapping
Outcome 1 Demonstrate an understanding that science is based upon observations of the universe and apply the scientific method as a research tool.	<b>Institutional Student Learning Outcomes:</b> Act 3, Think 1
Outcome 2 Use the scientific method in collecting data, formulating and testing a hypothesis then reaching a conclusion.	<b>Institutional Student Learning Outcomes:</b> Learn 3, Think 1
Outcome 3 Read, analyze, and interpret data to draw valid scientific conclusions and communicate those conclusions in a clear and articulate manner.	<b>Institutional Student Learning Outcomes:</b> Communicate 1, Learn 3, Think 1

## 2014-2015 Assessment Cycle

### Measurements

#### Outcomes and Measures

#### ASTR 140 Astronomy Laboratory Outcome Set

##### Outcome

###### Outcome 1

Demonstrate an understanding that science is based upon observations of the universe and apply the scientific method as a research tool.

▼ **Measure:** SLO 1 - SN1987a Analysis  
Course level; Direct - Other

**Description of Measurement Tool:** A specific lab, SN 1987a, was chosen such that it focuses on the collection of data by the student, their own analysis of that data, and the forming of a conclusion based on the data collected. Overall completion as well as a subset of the questions were used to address whether students could properly support their conclusion with data.

**Criteria for Success: Individual & Collective Student Criterion:** Success is determined if the overall lab average is 60% or above AND if more than 60% of students students can justify their conclusion with at least one correct reason drawn from their data and analysis.

**Cycle of Assessment:** Data Gathered: Fall 2014, Analyzed and Reported Spring 2015  
Adopted Cycle of Assessment:

Data Gathered: Fall semester of every EVEN numbered year, beginning 2016

Data Analyzed: Winter break/ Intersession of every ODD numbered year

Data Reported: Spring semester of every OOD numbered year

Change Implementation, due to back to back assessment of SLO 1. Beginning Fall 2015:

SLO 1: To be assessed Fall of every EVEN year

SLO 2: To be assessed Fall of every ODD year

**Who is Responsible for Assessment Activity?:** The instructor of record for each section is responsible for collecting the data need for the assessment tool. The data were submitted to the Department Chair for compilation and reporting. For Fall 2014, the report was submitted by Prof. Barembaum

### Findings

#### Finding per Measure

#### ASTR 140 Astronomy Laboratory Outcome Set

##### Outcome

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**Findings for SLO 1 - SN1987a Analysis**

**Summary of Findings:** Data were collected from the SN 1987a lab conducted during the last 25% of the class. All 3 of 4 lab sections were assessed and yielded a total of 57 students completing the lab.

The overall final average for all 3 sections is 85%.

60% of the students were able to correctly justify their conclusion with a supporting statement based on their data analysis.

83% of the students were also able to identify at least one source of error in the experiment.

67% of the students were able to correctly determine the type of supernova that occurred in 1987.

**Results:** Criteria for Success Achievement Status: Met

**Analysis of Findings:** Given that 83% of the students were able to justify their result with at least one correct reason from their analysis, 60% were able to identify at least one source of error, and the overall class average was 79% the SLO is considered to have been met.

A general understanding of the scientific method is used to draw a conclusion at the end of the lab. While only 58% were able to determine the correct supernova, the process that 90% of the students successfully worked through to justify their conclusion demonstrates their understanding of the method as a research tool.

**Recommendations:** The assessment of the Astr 140 SLOs has historically used the same lab, SN 1987a. The faculty feel it collectively addresses all of the SLOs for the course. It is an experiment done within the remaining 25% of the course. The faculty are encouraged to continue using the SN 1987a activity in the SLO analysis as well as to explore other lab exercises that specifically address data collection, analysis and conclusion supported statements

**Overall Recommendations**

*No text specified*

 **Plans of Action** **Status Reports**

## 2013-2014 Assessment Cycle

### Measurements

#### Outcomes and Measures

#### ASTR 140 Astronomy Laboratory Outcome Set

##### Outcome

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Adopted Cycle of Assessment:

Data Gathered: Fall semester of every ODD numbered year, beginning 2013

Data Analyzed: Winter break/ Intersession of every EVEN numbered year

Data Reported: Spring semester of every EVEN numbered year

Change Implementation (if needed): Fall of every EVEN year

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### Findings

#### Finding per Measure

#### ASTR 140 Astronomy Laboratory Outcome Set

##### Outcome

###### Outcome 1

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**Who is Responsible for Assessment Activity?:** The instructor of record for each section is responsible for collecting the data need for the assessment tool. The data were submitted to the Department Chair for compilation and reporting. For Fall 2013, the report was submitted by Prof. Martino

### Findings for SLO 1 - SN1987a Analysis

**Summary of Findings:** Data were collected from the SN 1987a lab conducted during the last 25% of the class. All 4 lab sections were assessed and yielded a total of 86 students completing the lab.

The overall final average for all 4 sections is 79%.

90% of the students were able to correctly justify their conclusion with a supporting statement based on their data analysis.

60% of the students were also able to identify at least one source of error in the experiment.

58% of the students were able to correctly determine the type of supernova that occurred in 1987.

**Results:** Criteria for Success Achievement Status: Met

**Analysis of Findings:** Given that 90% of the students were able to justify their result with at least one correct reason from their analysis, 60% were able to identify at least one source of error, and the overall class average was 79% the SLO is considered to have been met.

A general understanding of the scientific method is used to draw a conclusion at the end of the lab. While only 58% were able to determine the correct supernova, the process that 90% of the students successfully worked through to justify their conclusion demonstrates their understanding of the method as a research tool.

**Recommendations:** The assessment of the Astr 140 SLOs has historically used the same lab, SN 1987a. The faculty feel it collectively addresses all of the SLOs for the course. It is an experiment done within the remaining 25% of the course. The faculty are encouraged to continue using the SN 1987a activity in the SLO analysis as well as to explore other lab exercises that specifically address data collection, analysis and conclusion supported statements.

### Overall Recommendations

*No text specified*

### Plans of Action

### Status Reports



## 2012-2013 Assessment Cycle

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 **Measurements**

 **Findings**

 **Plans of Action**

 **Status Reports**