



Program Review - Instructional Program Plan

Program Title: Astronomy (sub-program to Physics/Astronomy)

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Executive Summary

Please summarize your program's strengths, opportunities/challenges, and action plans. This information will be presented to the Board of Trustees. (1000 word limit)

The astronomy program at Canada College presents the opportunity to introduce students to the physical sciences and scientific thinking in the context of learning about the universe. The courses require students to learn content, practice thinking in terms of the scientific method, as well as bring their reporting to college level. The strength of the program lies in the allure of learning about the great mysteries of the universe, as well as access to a great variety of instructional tools, including telescopes, globes, as well as a wealth of online resources. Students with no prior science background are able to learn new ways of observing and questioning nature, starting from basic observations to abstract theories.

Some of the challenges of the astronomy courses stem from its very purpose, in that a significant portion of the student have no prior science background, and many new students also have significant gaps in their learning skills. As such there are fluctuations and discrepancies in student retention and success rates. The program continually self-examines content and instructional methods to better match the background and abilities of students. Astronomy has recently piloted hiring tutors for its students, and it is hoped this additional learning tool can be expanded. The program currently still has gaps in its inventory, and its facilities arrangements are lagging what is normally considered appropriate for astronomy. We have just recently acquired new, up to date equipment and are anticipating additions throughout the coming semesters. This new equipment will be implemented into instruction to enhance learning. Some of the equipment (e.g. telescopes during star parties) will also be used to promote the astronomy program to the students, and to the general public.

With the expected construction of the new science building, including a rooftop observatory, astronomy is expected to grow due to better equipped, more appropriate facilities. The rooftop observatory is expected to attract more students, will allow for the expansion of course offerings (e.g. observational astronomy) or student projects, as well as become a boon for public outreach.

Program Context

1. Mission: Please identify how your program aligns with the college's mission by selecting the appropriate check box(es):

Career Technical Basic Skills Transfer Lifelong Learning

If your program has a mission statement, include it here.

Not applicable. Astronomy has no separate mission statement from the physics program



2. **Articulation:** Describe how your program's articulation may be impacted by changes in curriculum and degree requirements at high schools and 4-year institutions. Describe your efforts to accommodate these changes.

There are no expected changes for astronomy.

3. **Community and Labor Needs:** Describe how changes in community needs, employment needs, technology, licensing, or accreditation affect your program. CTE programs should identify the dates of their advisory group meetings.

There are no expected changes for astronomy.

Looking Back

4. **Curricular Changes:** List any significant changes that have occurred in your program's curricular offerings, scheduling, or mode of delivery. Explain the rationale for these changes.

There are no expected changes in course offerings at this time. We may have slight variations in the number of sections offered in AST 100 and 101 depending on enrollment demands. We continue to offer classes both on campus and online. An honors addendum has been added to the courses, and as of Spring, 2015, honors sections are offered in AST 100. The Honors Program has requested that there be more physical science section offerings to satisfy demand.

5. **Progress Report:** Provide your responses to all recommendations received on your last program review and report on progress made on previous action plans and toward your strategic goals.

[Link: 2013-2014 Program Plan and Feedback forms](#)

The 2014 review requested that our programs connect our performance and data packet analysis more explicitly to our action plans. While we feel this was satisfied last year, we continue to make additions to our respective analysis and plans.

6. **Impact of resource allocations:** Describe the impact to-date that each new resource (staff, non-instructional assignment, equipment, facilities, research, funding) has had on your program and measures of student success.

The astronomy program has recently acquired new instructional equipment. Impact on student success will be examined this upcoming year.

As of the Fall 2014 semester the program has recruited astronomy tutors. While only a handful of at-risk students have taken advantage of the opportunity thus far, those that did successfully passed the course. In the Spring 2015 semester we are piloting embeded tutoring for AST 100.

Current State of the Program

[Data packets link http://www.canadacollege.edu/programreview/datapackets1314.php](http://www.canadacollege.edu/programreview/datapackets1314.php)

7. **Connection & Entry:**

- A. **Observation:** Describe trends in program and course enrollments, FTES, LOAD and Fill Rates. Cite quantitative data and specific tables from the data packets.

Astronomy had lower than usual enrollments (260 in 2013, down from 359 the previous year, see table: Census Headcount) during the 2013-14 year . This was partly due to less section offerings in Fall, 2013. Enrollment figures did improve somewhat for the Spring semester when more sections were offered, although some of them were severely underenrolled. Active recruitment of students is ongoing. Online enrollment has generally shown higher fill rates (see table: DE vs Non DE Courses). Also, daytime sections generally have significantly higher enrollment than night sections.

- B. Evaluation: What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections), marketing, and articulation that may improve these trends?

Active advertisement on campus has been implemented as of the summer of 2014, allowing for all sections to reach at least the threshold enrollment by the first day of classes. More advertisement is ongoing, such as display slides across campus (Learning Center, Grove, Library), and leaflets about AST 100 and 101 have been handed out on multiple occasions. In addition we continue to actively encourage the recruitment of students through Middle College. We have now organized two star parties, one each for the Summer and Fall of 2014 to also increase the visibility, and allure of the astronomy program. Finally, the new honors sections added to AST 100 may attract additional students from the Honors Program. As of this writing the enrollment figures for Spring, 2015 for AST 100 are a slight improvement over previous semesters.

8. Progress & Completion:

- A. Observation: Describe trends in student success and retention disaggregated by: ethnicity, gender, age, enrollment status, day/evening. Cite quantitative data and specific tables from the data packets.

The retention and success rates (see table: annual retention and success) did show a drop for the 2013/14 years. This trend was observed for all student categories (by gender, or ethnicity). This drop may have been due to temporary changes in some course content or methods of instruction (see plan for correcting this below under Evaluation). White students, as in previous years continue to have higher success rates than African American, Hispanic, and "unknown" ethnicity students.

- B. Observation: For online courses describe any significant differences in the success and retention of students who are taking online courses compared to face-to-face courses.

For the 2013/14 year both online and f2f sections (see Retention and Success by DE Ed description) showed a relatively low rates of retention (79, and 77%) and success rates (62%, and 61% respectively) compared to previous terms.

- C. Evaluation: Based on these trends, what do you feel are significant factors or barriers influencing student success in your courses and program? What changes (e.g. in curriculum, pedagogy, scheduling, modality) could be implemented to improve these trends?

The drop in student retention and success rates may have been due to changes in instruction methodology for the 2013/14 years. For example, in the f2f sections there was an attempt at introducing some basic math and calculations. Unfortunately this discouraged a significant portion of the students. This content has now been removed. The drop in retention and success



rates for the online sections is not yet explained, but considering that the online offerings are still relatively new on this campus, the instructional methodology will be examined for better online delivery as the course develops.

9. SLO Assessment:

<https://smccd.sharepoint.com/sites/can/CANSLOAC/default.aspx>

- A. Are all course SLOs being systematically assessed at least once/4 years? Describe the coordination of SLO assessment across sections and over time.

Astronomy proposed changes to the SLOs as of the Spring of 2014 to bring them more in accord with the Physics/Astronomy PLOs as well as the college ILOs. The new SLOs are scheduled to be systematically evaluated at the end of the Fall 2014, Spring 2015, and Fall 2015 semesters respectively. Coordination with the online faculty on this evaluation has been initiated.

- B. Summarize the dialogue that has resulted from these assessments. What are some improvements in your courses that have been implemented through SLO assessment? How has student learning been improved by changes in teaching? Cite specific examples.

The new SLOs have not yet been evaluated, hence discussion of improvements is not yet based on their evaluation. However, less systematic evaluation of course content and instructional methodology is ongoing based on assignment and exam returns. For example, as mentioned above (8C: Evaluation above) the math content for AST 100 was removed as to not discourage students with poor math backgrounds. Homework and exam questions are continually being revised to accurately measure student knowledge, as well as help retain struggling, and special needs students.

10. PLO Assessment:

PLO Assessment link https://smccd.sharepoint.com/sites/can/prie/_layouts/15/start.aspx#/

- A. Describe your program's Program Learning Outcomes assessment plans and results of direct and indirect assessments.

Not applicable. The astronomy program has no separate PLOs from the physics program.

- B. Summarize the major findings of your program's PLO assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

Not applicable.

Looking Ahead

11. Strategic goal & action plans:

How will you address the opportunities for improvement that you identified above in Articulation, Community & Labor Needs, Connection & Entry, Progress & Completion and PLO Assessment? Identify timelines for implementation, responsible party, and resource requirements.



Action Plan	Timeline	Responsible party	Resources required
Active recruitment	Continual throughout the year.	Elteto, Digel, Prochter	Leaflets, Powerpoint slides, star parties
Improved retention and success	Continual throughout the year.	Elteto, Digel, Prochter	Self-evaluation of course content and instructional delivery, tutors, embedded tutoring
Testing of new instructional equipment and implementation for instructional use	Spring and summer, 2015	Elteto, Digel, Prochter	Requested equipment, re-examination or new development of student activities and labs
Address gender and ethnicity enrollment and success discrepancies	Continual throughout the year.	Elteto, Digel, Prochter	Active recruitment, examination of how the courses are being articulated, self-evaluation of instructional delivery

Complete the Resource Request form to request instructional equipment, IT equipment, facilities, professional development, research, or funding (if needed) and submit with this form to your Division Dean.

Link to resource request form <http://www.canadacollege.edu/programreview/instruction-forms.php>