



### Background & Struggle

Astro 101 is a generic label for introductory survey courses for non-majors in University.

A common struggle for instructors of Astro 101 is working with, or around, the students' deficiencies in science and mathematical preparation.

Astro 101 can be taught as a watered down (astro)physics course but can lead to frustration of both instructor & students.

- Instructor sees student deficiencies
- student sees focus on math & physics

This poster describes an implementation of Astro 101 where the paradigm has been turned around to work with the strengths of the non-major students, rather than focusing on their deficiencies.

The term paper is illustrated in detail.

### Student Strengths

Kwantlen Polytechnic University (KPU) is an undergraduate University outside Vancouver, Canada

- All classes are limited to 35 students
- The typical Astro 101 student at KPU is an arts or business major
- Astro 101 carries a 1<sup>st</sup> year number, but
  - students can be in years 1, 2, 3 or 4 of a 4 year degree

When students enter the Astro 101 class, they typically bring with them skills and experiences exceeding those of typical science undergraduates, in areas such as

- paper writing
- active group learning
- public speaking
- group presentations

Business students are particularly skilled at group presentations

### Course Components

Group Presentations & Peer Feedback	20%
Collaborative Group Assignments	20%
Online Homework prior to class	10%
Labs (weekly)	25%
No Exams	0%
<b>Term Paper (this poster)</b>	<b>25%</b>
<b>Total</b>	<b>100%</b>



### Term Paper

During a 13-week semester, each student develops a topic and writes a paper. There are five main components to the process.

#### Part 0 – Plagiarism Awareness Tutorial

(due Week 5)

The University offers an online tutorial on citation and what constitutes plagiarism.

Students:

- Take the tutorial and earn a digital “badge”
- Many have already done it
- Required before submitting a proposal



#### Part 1 – Proposal

(due Week 5)

Each student submits a proposal

- “Free” choice of topic
- Encourages early start on paper
- Must include at least one reference (i.e. students must first find literature)
- Requires instructor approval
- Often requires revision/resubmission

A common reason for non-approval is a topic that is too broad & shallow.

Small class size means the instructor can work with each student on developing a reasonable proposal.

- Personalized topic reduces “copy & paste”

#### Part 2 – Paper (main body)

(due Week 10)

Papers are:

- 6–8 pages
- Requires 3+ sources

#### Part 3 – Abstract Booklet

Abstracts are:

- Submitted online (due Week 10)
- Compiled into a booklet
- Distributed to all students (Week 11)

Homework Assignment #12: (due Week 12)

Abstracts are split into two groups.

For the first group:

- Read each abstract and
- Prepare at least one question to each author (to be used during panel discussion)

Homework Assignment #13: (due Week 13)

- Do same for second group



#### Part 4 – Panel Discussion

(Weeks 12 & 13)

Students are called up in groups of ~4

Each panel:

- Ideally assembled from related topics
- Fields questions from the class or each other
- Lively debate is common

Panel discussion provides a forum for students to share their new knowledge with the class, transforming what might have been a solitary exercise of paper writing into a culminating community experience.



### Discussion

The course described here is very different from the traditional science course.

Astro 101 is perhaps the student's last science course:

- No requirement to prepare student for the next astronomy course with specific content
- This freedom helps make departure from traditional practice possible

**Plagiarism** – unintended improvement

- A widespread concern at Universities
- Reduced incidences of plagiarism on papers
- Possible reasons
  - Instructor works with student on topic
    - Topics are less generic
  - Student has to appear on panel
    - must actually know the topic

This format is made possible with small classes.

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