Physics 3930B: Space Flight Experiments
==Draft== Course Outline

1. Course Information

Course Information
Data obtained from remote instruments can be used to detect tornado tracks, find distant black holes, measure the composition of the atmosphere, or map craters on other planets. The path from asking a science question to getting the information to try to answer it has many steps, and the Space Flight Experiments course will take students through the initial part of this process. Specifically, student teams will develop science questions (what do you want to know?) that lead to engineering requirements (what do you need to find out?). The next steps include designing the science payload (instrument) that would be carried on a remote platform including a drone, airplane (for an aerial survey or parabolic flight), stratospheric balloon, or cubesat to collect the data needed. The final output of each team will be a written proposal that lays out the case for their instrument and includes an analysis of the feasibility, including budgeting and timeline.

List of Prerequisites
Physics 1202, 1402, 1502 or equivalent. Special permission is required to take the course for all students. Priority will be given to upper year students enrolled in Physics and Astronomy modules.

For special permission, please login to the [Physics and Astronomy Help Portal](#).

Unless you have either the prerequisites for this course or written special permission from the Department of Physics and Astronomy to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

2. Instructor Information

Full name, title and appropriate contact information of the instructor and, if the course is taught by more than one instructor, the name of the person responsible for the course (course coordinator).

Instructors	Email	Office	Phone	Office Hours
Dr. Sarah Gallagher	sgalla4@uwo.ca	PAB 205	X86707	TBD
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Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

This experiential learning course is designed to give students real-world experience of the process of developing a payload (science instrument) for a space mission. This will involve developing a science case that determines the engineering requirements for the instrument. Next, the team will develop a payload design and write a space agency proposal to make the case for funding their payload. Proposals will be reviewed by an expert panel, and the top proposals will be chosen for support for subsequent development. Students will be evaluated on individual and group assignments.

Learning Outcomes:

By the end of this course, students will be able to:

Individual
1. Describe the steps of space mission development from concept to design, build, operations and data analysis.
2. Work and communicate respectively and effectively with team members.
3. Contribute substantively to team project deliverables.
4. Manage a component of a project to meet deadlines.
5. Present a robust case to an expert panel.
6. Contribute to a team operating a science instrument remotely.

Team
1. Develop a science case for a mission payload.
2. Populate a science traceability matrix that links science observables to engineering requirements.
3. Write and present a proposal that demonstrates motivation and feasibility (including budget and schedule).

The course will meet for 1 3-hr session weekly. Students will also be expected to meet with their teams regularly to advance their work.

If available, insert a breakdown of course topics in a "table of contents" format with an approximate timeline.

[optional] Include the relevant Key Sessional Dates listed below for your course:
Classes begin:
January 5, 2026
Spring Reading Week: February 14 – 22, 2026
Classes end: April 9, 2026
Exam period: April 12 – 30, 2026