

4999E Biology + Integrated Science Information Session

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4999E

The nuts and bolts

1.5 Essay Course, runs from beginning of Fall term to end of Winter term*

Must be registered in an honours specialization in Biology Department (Animal Behaviour, Biology, Genetics, Biodiversity and Conservation)

Or through the biology stream of the IGS program

Research-based course, ultimate goal is to produce a thesis

Requires a supervisor and advisory committee.

* exception: projects with field components

4970F/G and 4971G/Z

The nuts and bolts

These are 0.5 Essay Courses, either in the fall or the winter term.

Each one of these courses gives 0.5 credits so that they can be easily combined/replaced with other courses in need of changes.

Must be registered in an honor's specialization in Biology Department (Animal Behaviour, Biology, Genetics, Biodiversity and Conservation).

Research-based course, ultimate goal is to produce a final research report.

Requires a supervisor and advisory committee.

Type of Project

We are hoping that the coming year will allow for wet lab and field experiments.

And we expect *in silico* projects.

However we do not have a crystal ball.

Different roles

Course co-ordinator: answers questions; makes decisions; deals with accommodations etc...

Course administrator: assists; DOES NOT answer question NOR makes decisions

Supervisor

Co-supervisor (required for some projects)

Advisor

Mentor (optional)

Supervisors

Faculty in the Department of Biology.

Adjunct and cross-appointed faculty in the Department of Biology.

How do I know the status of a potential supervisor?

Form for project approval, supervisor signature and abstract submission are available online.

The forms are required by April 30, 2023

How to find (and choose) a supervisor

Identify an appropriate individual(s) who does research you are interested in

- A Professor from a class you enjoyed?
- Biology Website: describes all faculty in the Department and their research interests.
- A topic you are interested in?
- Hearsay?... Not always the most advisable way....
- Check the List posted on the Biol4999 website or check the faculty webpage.
- Don't be afraid to ask Profs for advice.

You are not bound to this topic for life.

It is a two way street – both you and the supervisor have to agree to work with each other.

Start making appointments with potential supervisors to get a better understanding of a potential project and lab environment.

You can interview with more than one – but only commit working with **ONE**.

- My opinion: you should interview with more than one....

How to approach a potential supervisor

Professional email.

Explain why you are contacting them, why you are interested in a project.

Attach a transcript and CV/Resumé.

Ask if they are taking honours thesis students, and if you can discuss this further.

Can you meet? Nowadays can be done over zoom or in person.

Do you have to prepare for the interview?

All supervisors are different

Enthusiasm, investment, involvement.

Will you be part of a lab, or on your own?

Are there appropriate resources for a 4999E student? Does the supervisor have the time resource for this?

What are their expectations of a student performing an independent research study?

Can you talk to their existing honours or graduate students? Can you visit their lab and/or lab meeting?

Will they be supervising you directly and/or involve a PhD student or PDF (and can you meet them)?

Remember not only is every supervisor different – so are students 😊 Try to find the right combo for you.

Co-supervisors, mentors

Co-supervisors

Faculty who have a primary appointment outside of Western (for example an adjunct), or have not previously supervised a 4999E student and require a co-supervisor.

As co-supervisor can serve:

- Regular or cross-appointed faculty from Department of Biology.
- They need to attend meetings and contribute to progress evaluations.
- Must be arranged at time of application to program (**April 30**).

Mentors

- One PhD student or postdoc who is closely involved in the student's work.
- Attends meetings, but does not contribute formally to evaluation.
- Can be added in **September**.

Advisory committee

This needs to be arranged by September – not right now.

Two members, evaluate proposal, progress report, and thesis.

- At least one must be a regular or cross-appointed faculty member of Department of Biology.
- The other can be regular/adjunct/cross-appointed faculty.
- OR a PhDs student or Postdoc from Department of Biology .
 - not from your lab group; list of potentially available students will be provided in September.

Committee composition needs to be discussed with your supervisor.

Committee compositions needs to submitted early in **September**.

Apply for the course

Form is available online: **due April 30.**

Needs signature from your supervisor (and co-supervisor).

Submit to Course Co-Ordinator Susanne Kohalmi by email.

For IGS students: also send form to Felix Lee by email.

- if you are enrolling through Integrated Science with a project in Biology/Genetics/Molecular Biology etc.
- Students in this course and a project in these areas of Biology are following the rules for Biol4999E.

Finding a project

Talk to your supervisor about what they have in mind.

They will expect you to have read some of their papers, and to be willing to read (many) more.


Some supervisors will give you a more-or-less planned out project.

- Often a side project from a graduate student or post-doc in the lab.

Some will give you some tools, and expect you to come up with your own based on your shared interests (and the resources available).

Expect some discussion about what your project will entail – your supervisor knows you've never done this before!

You don't have to nail down your project until September.

 **EXEPTION:** projects with field work: deadline for first committee meeting before you leave for field work.

Is this project a good one?

Will it produce numbers/results?

Are the appropriate resources and permissions available?

Are the techniques established in the lab?

Is it a reasonable amount of work?

Is it supported by the literature?

If you will be using pre-existing data or samples, are they clearly available to you and is it appropriate to use them for this purpose?

As you have never done this – these questions might be difficult to answer for you – take them as a guide – the answer might not be **YES** to all of them.

Is this project for me?

Is it a question/topic/organism that interests you?

Don't get hung up on labels:

- ... a genetics project can be done in a physiology lab...
- ... a biochemistry project can be done with plants, animals, microorganism...

Will you use and develop skills relevant to you?

- E.g. lab vs. field; data analysis, microscopy, molecular biology, computer programs etc.

If you have any personal ethical or other concerns about it you should discuss this with your supervisor.

A topic you love vs a topic you grow to love.

Remember there are many aspects in biology you have never encountered but they could be the coolest topic you can discover.

Can I start working in the summer?

If your only opportunity to gather data (i.e. fieldwork) is in the summer, then it can be possible to begin in the summer.

- **You need to assemble your committee, and defend your proposal, before you go into the field.**
- **Your timeline will be different.**
- **Your progression report is due at proposal time, thesis is due at progression time.**

You can not begin in the summer simply to get the bulk of the work out of the way before term starts.

- Among other reasons, this is not fair to those who don't have the financial and other freedom to simply work on their project all summer.

You MAY develop skills and tools you will need for your project during the summer, before using those tools to conduct your research during the academic year.

Examples: Summer work

Frodo will be working on nesting tree swallows, and needs to do fieldwork in the summer.

- Must assemble a committee and write and defend proposal before the start of fieldwork.
- Indicate that you are planning to do field work and contact Dr. Kohalmi ASAP.

Galadriel has the summer off. She plans to have all her Western Blots done and data analysis complete before starting her research project in September. This should make the year pretty straightforward.

- Not OK.

Pippin will be doing a project on gene expression in wheat plants. He will start growing the plants in the greenhouse in July so they are at the appropriate developmental stage for him to begin his experiments in the Fall.

- OK: summer will be spent developing the material, but not doing the experiments.

Sauron will be working on gene expression in overwintering slugs. Over the summer, he plans to develop the extraction protocols and test all his primers so he knows that his project will work in the Fall.

- OK: summer spent developing tools, but actual experiments will be done during the term.
- But also can be part of the project itself

Merry plans to spend the summer on the beach but takes a pile of papers to read so he will understand the background and technical approaches of his project by September.

- More than OK. He can hit the ground running and writing the proposal will be far easier.

Arwen is going to spend the summer at her family farm helping with the walrus herding. She will come back in September and begin rearing her tadpoles then.

- Totally OK. The course is designed to work fine only in term time.

Can I get paid to do the Honours thesis?

Nope.

If you are doing paid research in the lab over the summer (e.g. as a USRA or summer student), then you can use this time to develop tools and techniques, but you cannot use the time to work on your project.

If you have permission to begin your project (e.g. in the field) in the summer, but are also being paid to work as a field assistant, your paid field assistant activities must differ from your project.

If you are paid to work in the lab in term time (e.g. as a work study student), your paid duties cannot include your research.

- i.e. if you are washing dishes, they have to be lab dishes, not just the things you generate from your own work!

Can I do my project off-campus?

Yes, for example at AAFC.

- Be aware of distances when timing experiments in between classes.

Yes, if doing fieldwork (in summer or during term) at nearby sites (e.g. Long Point, ESW) with a London-based lab and supervisor.

No, if the supervisor, lab, and facility are all based outside London, ON

- i.e. you can't do your project at a lab in Toronto or a biotech company in Guelph.

What if I've never done any research before?

This will be the case for many students in this course.

This course will allow to be exposed to new experiences and lab work.

This course allows you to learn.

This course will show you if you like this kind of work.

Your mark is not only based on how much data you produce but also on how much you learn.

This course will expose you to team work and the expose you to the experience to work with others.

Components of the course

Item	Deadline/notes	Value (%)
Proposal	Mid-October, followed by an assessment meeting	15
Progress report	Early January followed by an assessment meeting	15
Written thesis	Early April	25
Public presentation	On Saturday at the end of March/beginning of April Attend this year's on April 1?	15
Supervisor evaluations	Proposal	5
	End of fall term	5
	Progress report	5
	Final project	15

* this is the current distribution of marks. This course will be reviewed in the summer which could result in some adjustments.

* timeline will be different for projects with field work in the summer.

Proposal

“The purpose of the proposal is to ensure that you have a good grasp on the context of your project and on your methods, and that the project is likely to produce useable data (which you will need for your thesis!)”

~2500 words

Includes description what you have learned so far, preliminary data and timeline

Doing the work

What you do will depend on your project.

- Generally become a member of the lab in which you are working.

Learn skills taught by supervisor and/or lab members or develop on your own with some guidance.

You keep a 'Research Investment Log' that allows you to keep track of your work. You provide this to your supervisor. and the course coordinator

Includes cleaning up after yourself – don't leave a mess for others to deal with.

Supervisor

- Evaluates your progress according to a rubric.
- Meets with you periodically and fills out a formal performance assessment.

Classes

~12 mandatory classes during term (Monday evenings).

Discuss mechanics of the course.

Discuss skills and processes.

Professional and career development.

Goal is to keep everybody on the same page.

Presentations and Ontario Biology Day

Part of Proposal and Progression meetings.

Biology presentation day – also a mini- conference at which your presentations are assessed for this course.

Ontario Biology Day is a regional conference where honours thesis students from around the province present their work to their peers (and some faculty).

Counts as a conference on your CV.

Timing allows you to treat it as a dry run for your Oral presentation.

Attendance fully paid for by the Department of Biology (there could be some limitation on the number of students who can attend).

- If it takes place.....

The “thesis”

Written as a scientific manuscript

~25 pages

Who marks it?

Proposal, Progress Report, Final Report

- Advisory Committee

Oral Presentation

- At least two faculty/PhD students/Postdocs

Lab work

- Supervisor Evaluations

All according to standardized rubrics.

What if my data aren't “any good”?

The assessments judge the quality of inference (conclusions reached on the basis of evidence and reasoning), the rationale for trouble shooting, and communication, not the data *per se*.

Negative data are data

Learning from experience

Trouble-shooting

Can I get a good mark in this course?

Yes, but it's a challenging course. Usually 5-6 people have a mark of 90% or higher (which is in line with our expectations for other 4th year courses).

You can't get out what you don't put in....

In contrast to other courses this one will not succeed without self motivation and commitment.

And time management!

What skills will I learn?

Written and oral communication

Time management

Project management

Troubleshooting

Critical thinking

Technical skills

...

Why should I do an independent research project?

As a student with a science degree, an honours thesis helps you to understand and evaluate facts and research.

- This is more important now than at any time since the enlightenment!

If you want to continue in research, an independent research project is more-or-less very much recommended.

- Provides evidence to future supervisors that you can do science.
- Gives you experience doing science that you can carry through to your graduate work.

If you want to go to a professional school, an independent research project is a valuable experience to help you understand where those facts come from!

Biology 4999E

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For more information go to www.uwo.ca/biology

Undergraduate > Course Information > All courses

(and scroll to the bottom); links to forms are available on this site
