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).

- This is a different course from SynBio4998E
- This is different from the 4970F/G courses which are 1 term courses

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

Requires a supervisor and advisory committee.

Type of Project

We allow for wet lab and field experiments.

And we accept *in silico* projects.

However, we do not have a crystal ball about how a project will develop ☺

Many people involved with different roles

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

- Susanne Kohalmi

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

Supervisor

Co-supervisor (required for some projects)

Advisors

Mentor (optional)

Supervisors

-> Faculty in the Department of Biology.

-> Cross-appointed faculty in the Department of Biology.

-> Adjunct faculty in the Department of Biology
- (restricted to those who are local).

How do I know the status of a potential supervisor?
- -> check our website
- -> ask the potential supervisor

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

The forms are required by April 30.

How to find (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 then one – but only commit working with 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 on 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

Who needs a Co-supervisor

- Faculty who have a primary appointment outside of Western (for example an adjunct).
- Faculty who have not previously supervised a 4999E student.

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 the program (**April 30**).

Advisors and Mentors

Advisors

Two advisors, 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 PhD student or Postdoc from the Department of Biology .
  - **not** from your lab group.

Mentors

- Optional
- One MSc, PhD student or postdoc who is closely involved in the student's work
- Attends meetings. Limited involvement in evaluations.

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).

Needs an abstract.

- In case of summer field work: an explanation for timing

Submit to Course Coordinator Susanne Kohalmi by email.

For IGS students: also send form to Felix Lee/Christina Booker 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 in addition to IGS rules.

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 form a graduate student or post-doc in the lab.

Some will give you some tools, and expect you to come up with your own approach 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.

Projects are often reviewed and adjusted and can change….

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?

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

Will you use and develop skills relevant to you?

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

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.

- **Your timeline will be the same – but you will be evaluated on the progress done in analysing your data**

You **cannot** 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 write a specific rational for the need to perform summer data collection
- 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. Somone 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.

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 **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 during the term (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 most 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 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 **Saturday March 28**?	15
Supervisor evaluations	Proposal	5
	Progress report	10
	Final project	15

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

Milestones

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

Progression Report

Update on progress after the Winter Break

Shorter, focused on progress, potential problems, what is left to do

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.

You have to keep a 'Research Investment Log' (RILs) that allows you to keep track of your work. You provide this to your supervisor.

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

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

optional

Counts as a conference on your CV.

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

Depending on location, attendance might be fully paid for by the Department of Biology (there could some limitation on the number of students who can attend).

- If it takes place…..

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

mandatory

The “thesis”

Written as a scientific manuscript

~25 pages

Due at the end of this course

Who marks it?

Proposal, Progress Report, Final Thesis

- Advisory Committee

Oral Presentation

- At least two faculty/PhD students/Postdocs

Lab work

- Supervisor

All according to standardized rubrics.

What if my data aren't "any good"?

The assessments judge the quality of inference (conclusions reached based on 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

Working in a lab environment

…

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 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!

HOWEVER – this is not a mandatory course to get a degree in Biology

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