

## 1. Course Information

**Course:** Physics 4999E, Honours Thesis Project, 2020-2021

2 hours per week, ONLINE.

**Prerequisite(s):** Registration in the 4th yr of an honors Physics program (4999E) 1.0 Course

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

## 2. Instructor Information

**Course coordinator: Prof. Giovanni Fanchini**  
Room 229, Physics and Astronomy Building (PAB)

You can reach me via e-mail at [gfanchin@uwo.ca](mailto:gfanchin@uwo.ca), or by phone at 519-661-2111 x86238 (I will be checking my voicemailbox periodically).

When contacting the instructor by email, students must use their Western (@uwo.ca) email addresses. Other accounts (e.g. hotmail and gmail) are often tagged as spam, and it is possible your message will not be received. Please indicate the course number ("Phys 4999E") in the subject of your message.

**Office hours:** By e-mail appointment

## 3. Course Syllabus, Schedule, Delivery Mode

The student will work on a research project, either experimental or theoretical, under faculty supervision, and present the results in a written report and in a seminar.

**Learning outcomes:** Please refer to the course OWL site (Resources)

**Lectures:**      Thursday #                      12:30 - 1:30 PM                      ONLINE (Zoom)

## 4. Course Materials

In this course, students perform scientific research under supervision of a faculty member. The research project can be experimental, theoretical or computational, and can in principle be in any field that contains a physics – be it fundamental or applied. This course is intended to provide students with a good sense of what scientific research is about through a hands-on experience. An important component in modern research is the presentation of ongoing research and results, both orally (e.g. conferences) and in written form (papers in refereed journals). At the end of the course, students will therefore present the results of their research project both through an oral (online) presentation and a written report (thesis). Both presentation skills will be practiced by means of a writing assignment and a midterm presentation; feedback from these assignments can then be used to improve the final presentation and the thesis.

### 1. Finding a project

Your first task is to find a supervisor and a project suitable to the ongoing COVID-19 situation.

If you have a good feeling for the area of research you would like to work in, but no good idea about a supervisor, connect to the course coordinator. Some of you may already have decided on a project. It is up to you to discuss the projects with the perspective supervisor. In some cases, you may find a supervisor from another department (e.g. Chemistry, Roberts, Lawson Health Research Institute, the London Regional Cancer Program, ...).

As soon as you have decided upon a project and supervisor, you should prepare in consultation with your prospective supervisor, a summary to the benefit of the course coordinator, in which you request an appointment for a short (15-30') Zoom meeting, to discuss about your project proposal.

The summary (to be emailed to the course coordinator, cc'd to proposed supervisor) should contain

- Proposed supervisor name.
- Title of the project.
- 4 project highlights (bullet-pointed, of no more than 85 characters each, including spaces) formulating the area of research, the important research question your project is intended to solve, the intended methodology, and the added value of previous efforts by the scientific community in this direction.
- If you have previously worked with the same supervisor, you must also indicate in what your project differentiates from should efforts. Projects that are just continuation of previous research (e.g. summer research, NSERC USRA) with the same supervisor are normally not approved, as they put other students at disadvantage.
- Copy of a contingency plan prepared and/or approved by your supervisor demonstrating that your project is feasible during the ongoing COVID-19 situation. For example, the plan should describe how you will be able to get all of the necessary training safely and “in remote”. This is, of course, valid also for projects that are not experimental in nature. Projects that require the student to come to campus are normally not encouraged, this year, and, in those cases, the contingency plan must also indicate that i) your perspective supervisor’s lab has University-

approved standard operation procedures (SOPs) in place to remain open during the ongoing COVID-19 pandemic, ii) your proposed project is compliant with social distancing and other mandatory rules, and iii) any approval will be contingent of your supervisor obtaining clearance for you to work at the project from the Department of Physics and Astronomy and the Faculty of Science.

In any case, your project will not be approved until after you had the Zoom meeting with the Course Coordinator. This meeting is typically scheduled in mid-September and must be scheduled on or before **September 20<sup>th</sup>, 2020**.

If the project is approved by the course coordinator, you have to write an abstract according to the information you will receive at the course Zoom lectures, and prepare it in a final format on a MSWord (or equivalent) page that includes a) your name, b) the project title, c) your supervisor's name, and d) the final abstract (from 200 to 500 words) reporting the specific goals that have been defined for your project. This project description should be completed and submitted through the OWL site no later than **September 30<sup>th</sup>, 2020**. Any change of supervisor (including the addition of any co-supervisors and/or collaborators) as well as any modification in project title and research direction must be approved by the course coordinator and will likely require another Zoom meeting.

The sooner you start effectively working on your research project, the better. You are normally expected to devote on average 8 hours per week on your research project throughout the entire year. It is between you and your supervisor how exactly you arrange your time spent on the research project. Generally, it helps a lot to set aside a particular time each week to talk with your supervisor (e.g. via Skype or Zoom) and discuss your progress. This is also the time to bring up possible concerns you might have regarding the research project or your progress.

### **Library Workshop**

A workshop led by the librarian for Physics & Astronomy and related sciences is tentatively scheduled for **Thursday October 15 (12:30pm to 1:30pm)**. This workshop is intended to show you what resources are available for literature review, how to properly use citations in your work and will explain what exactly constitutes plagiarism. Attendance of this workshop is mandatory.

### **Writing assignment: Introduction & Literature Survey**

As a first assignment for this course, you are then to write up what will later become the first chapter of your thesis: "Introduction & Literature Survey". Specific guidelines and instructions for this assignment will be posted on the course website. You should submit this document by **Friday, October 30<sup>th</sup> 2020**, again through the OWL site (please upload one PDF file only). The course coordinator will evaluate this document and provide feedback.

### **Keeping record of your research progresses: Log-books**

An important aspect of research is keeping record of what you have done. The more accurate your records, the easier will be for you and the scientific community to reproduce your results and understand the significance of what you are doing. A laboratory log-book is a day-to-day "diary" of the research a

scientist is carrying on. You are required to keep an **electronic log-book** of your honors research and each page should be dated and report the essential details useful to reproduce your experiments, studies and/or calculations. From your log-book, it should be possible to understand how many hours per month you approximately spent working on your project. If applicable, your log-book must also list the samples you prepared, the data you acquired and the scientific instruments you used. It must describe the theoretical methods and computer codes you are developing or utilizing for calculations, data manipulation, and graphs. If applicable, you should also refer to other repositories where your samples or data are stored (e.g. cabinets for sample storage, databases or files stored on a server of your research group). On a monthly basis, your log-book must be **electronically signed** by your supervisor and by the course coordinator. In order to get these signatures

- Please upload an **updated electronic copy of your logbook to your Western's One drive**,
- Share the link by email with your supervisor and the course coordinator. In this email, please instruct your supervisor to read the log-book and approving it
- Await an email reply from supervisor and coordinator indicating they have read the logbook and offering any comments they may have on it.

Signatures are required from October to March (included) by the first Thursday of the corresponding month (one exception is the January signature that is required by **January 14** due to Christmas holidays). It is your responsibility to obtain these signatures on time. At the end of your project, your log-book must be placed in your OWL Phys 4999 dropbox for the course coordinator to grade it. The quality of your log-book will be evaluated and will count for 5% in your overall course evaluation.

### **Mid-year evaluation from Supervisor**

On **January 14**, your supervisor will be asked to evaluate the research progresses you have achieved so far. Such evaluation counts for 5% of your course grade. Work performed on a day-to-day basis and good preliminary results generally lead to favorable mid-year evaluations.

### **Midterm Presentation**

In mid-January (date to be confirmed on the course website) we will schedule a series of short (12 minutes, with an additional 3 minutes for questions) Zoom presentations in which each of you will outline the background of your project, the goals, and the progress you have made towards achieving these goals. The talks will be virtually attended by all other Physics 4999E students, the course coordinator and possibly your supervisor and interested faculty members. The course coordinator will evaluate these talks and provide feedback.

### **Final Presentation**

In early April we will schedule the final presentations. The project should be completed or very nearly completed by this time. These Zoom talks will be slightly longer (20 minutes, with an additional 5 minutes for questions), and all faculty members, supervisors and collaborators are invited to attend the talks and participate in the questions session. The final presentation is evaluated by all faculty members attending the talks and will count for 15% of your final marks.

### **Written Report (thesis)**

Finally, you should produce a written report (thesis) and submit it for evaluation. Specific guidelines and instructions relevant to the preparation of your thesis will be posted well in advance on the course website. Note that you need written approval from your supervisor before you can submit the thesis (see thesis guidelines). The deadline for submission of your thesis is **April 1st 2021** on the OWL site

(please submit one PDF file only). The submission of your written report must be approved in writing by your supervisor on a specific approval form that will be made available to you and has to be attached to the first page of your manuscript. The thesis will then be evaluated by two readers selected by the course coordinators. Such evaluation will count for 30% of your final marks. One reader will be a faculty member within the broad research field of your project; the second reader will be a faculty member in an entirely different field.

### Thesis revision and Rebuttal

When the comments of the readers are returned to you, you are expected to implement any corrections, additions or changes suggested by them. It is recommended you will show the readers' comments to your supervisor and seek for his/her advice during the revision process. You are also asked to write a rebuttal, with a list of the readers' comments and, for each of them, a short description on how you addressed the comment in the revised manuscript of your thesis. Specific information on how to write a rebuttal will be posted on the course website. Typically, a rebuttal will be 1-3 pages long, depending on the amount and the importance of the reader's comments. The resubmission of your thesis and the rebuttal must be approved in writing by your supervisor on a specific approval form that will be made available to you and has to be attached to the first page of your manuscript. Resubmission and rebuttal are due **April 23rd** (OWL site). At discretion of the course coordinator, your rebuttal and revised thesis manuscript can be returned for additional comments to at least one of the readers. Typically, this will be the case if the reader(s) requested major corrections to your thesis. Please be advised that, in such case, the reader(s) will be allowed to modify their evaluation marks after the second review stage. The updated evaluation will reflect the quality of your response and corrections. Your supervisor will be asked to make a final assessment of your work (final evaluation) after he/she has received the final version of your thesis and the rebuttal. Final evaluation from your supervisor will count for 30% of your final marks.

### Virtual Zoom Classrooms (Thursdays 12.30-1.30)

Date	Time	Location
Thu Sept 10	12.30-1.30 pm	Zoom
Thu Oct 17	12.30-1.30 pm	Zoom
Thu Oct 15 ** Library Workshop	12.30-1.30 pm	Zoom
Thu Oct 22	12.30-1.30 pm	Zoom
Thu Nov 11	12.30-1.30 pm	Zoom
Thu Dec 3	12.30-1.30 pm	Zoom
Thu Jan 14	12.30-1.30 pm	Zoom
Mid January **	TBA	Zoom – Midterm presentation
Thu Mar 12	12.30-1.30 pm	Zoom
Early April (date TBA) **	TBA	Zoom – Final presentation

There will be a few meetings that are primarily meant to provide you with information necessary to perform well in your project. The preliminary schedule for these meetings is listed below but might be subject to change. Meetings will have an informal character and will offer the opportunity for group feedback and for discussing emerging issues. A participation grade (5% max) will be assigned at the discretion of the course coordinator, and will include evaluation of your class attendance, as well as evidence of proactive dissemination of your honors research.

## Technical Requirements

Stable internet connection is required, with the ability to connect to Zoom (<https://zoom.us/>) for meetings and presentations. To this end, a personal computer or laptop is preferable over a mobile phone connection and a cable internet connection should be preferable over a wi-fi.

## 5. Methods of Evaluation

The overall course grade will be calculated as listed below:

<b>Course component</b>	<b>Weight</b>	<b>Evaluated by</b>
Introduction & Literature Review	5%	Coordinator
Log-book	5%	Coordinator
Participation	5%	Coordinator
Mid-year performance Evaluation	5%	Supervisor
Midterm presentation	5%	Coordinator
Final Presentation	15%	All attending faculty
Written report (Thesis) Evaluation	30%	Two Readers
Final performance Evaluation	30%	Supervisor

In rare cases, the Department of Physics and Astronomy may adjust the final course marks and this grading scheme in order to conform to Departmental policy.

### Deadline policy

Extensions to the course deadlines are normally not granted. If you miss any deadline, 0.5% will be subtracted from your final course grade for each day past of the deadline. Please refer to sect. 11 for a list of deadlines. If you have justifiable grounds for not meeting a deadline (e.g. long periods of illness) you must provide documentation supporting the reason for failure to meet the deadline. We also require explanation, and additional documentation, for the time passed between the deadline and when the course coordinator was contacted.

<b>Date</b>	<b>Subject</b>
<b>Sep 20</b>	Appointment with course coordinator for discussing subject of the research project
<b>Sep 30</b>	Project abstract uploaded on OWL site *
<b>Oct 1</b>	Log-book signatures
<b>Oct 30</b>	Introduction & literature survey uploaded on OWL site *
<b>Nov 4</b>	Log-book signatures
<b>Dec 3</b>	Log-book signatures
<b>Jan 14</b>	Log-book signatures
<b>Feb 4</b>	Log-book signatures
<b>Mar 4</b>	Log-book signatures
<b>Apr 1</b>	Written report (thesis) (OWL*) & logbook due (coordinator)
<b>Apr 23</b>	Revised thesis & Rebuttal due (OWL site) *

\* Deadlines for posting manuscripts on the OWL site will be at 11.59AM

## **Other course policies**

Permission is normally not granted to complete the Physics Honors Research over the summer term. If an extension of your research project over the summer is required, a written request providing justification must be sent to the Undergraduate Chair and the course coordinator. Permission will then only be granted at the discretion of the Undergraduate Chair and the course coordinator.

## **When to contact the course coordinator**

You should contact the course coordinator for any issue regarding the course that is not about the specifics of your research project. This includes logistical issues, possible ambiguities in guidelines or instructions, but might also involve possible problems with the project, collaborators or supervisor. If you have concerns about your progress, you should first of all express these concerns to your supervisor. If that does not resolve the problems, you should see the course coordinator as soon as possible. It might still be possible to redefine your project in November, but not in January. Ultimately, you are responsible for your progress; taking appropriate action when progress is not satisfactory is an important aspect of scientific research too.

# **6. Accommodation and Accessibility**

## **Accommodation Policies**

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

## **Academic Consideration for Student Absence**

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (i.e. the December final exam)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf)

and for the Student Medical Certificate (SMC), see:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

### **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see [http://www.registrar.uwo.ca/examinations/exam\\_schedule.html](http://www.registrar.uwo.ca/examinations/exam_schedule.html)).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See Academic Calendar for details (under [Special Examinations](#)).

## **7. Academic Policies**

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.



### **Contingency plan for an in-person class pivoting to 100% online learning**

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

**All of the learning sessions for this course may be recorded.** The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

**Scholastic offences** are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

**Completion of this course and writing the midterm and final exams in remote will require you to have a reliable internet connection** and a device that meets the technical requirements for this service and the system requirements for Zoom.\* Information about the technical requirements are available at the following link:

<https://www.proctortrack.com/tech-requirements/>

Information about the system requirements for Zoom are available at the following link:

<https://support.zoom.us/hc/en-us>

**Tests and examinations in this course may be conducted using Zoom.** You will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the invigilator if asked to do so at any time during the exam. The exam session will **not** be recorded.

More information about the use of Zoom for exam invigilation is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

\* Please note that Zoom servers are located outside Canada. If you would prefer to use only your first name or a nickname to login to Zoom, please provide this information to the instructor in advance of the test or examination.

## 8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western ([http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.