

**WESTERN UNIVERSITY**  
**Department of Philosophy**  
Undergraduate Course Outline 2025-26

**PHILOSOP 2032**  
**Einstein for Everyone**

**INSTRUCTOR INFORMATION**

Information including instructor contact details and course location can be found on the course Owl BrightSpace: <https://westernu.brightspace.com/>

**PREREQUISITE CHECKING**

*No prerequisites*

**COURSE DESCRIPTION**

This course considers the work of Albert Einstein and its impact, focusing mainly on the theories of relativity and cosmology. Mathematics will be kept to a minimum, and no physics background will be assumed. The course starts with special relativity, as formulated by Einstein in 1905. We will discuss Einstein's two postulates and explore their strange consequences for the behavior of measuring rods and clocks, and explain the meaning and importance of the relativity of simultaneity. How did Einstein discover special relativity? We will look at the historical context of his work, showing how it related to 19th century physics. We will also consider various consequences of the theory, such as  $E = mc^2$ , and alleged paradoxes (such as the twin paradox). We then turn to Einstein's most striking achievement, the general theory of relativity (1915). This theory is based on the remarkable idea that spacetime is curved. We will develop the background needed to understand this concept and the other basic ideas of the theory, and consider consequences of the theory related to cosmology and black hole physics. We will also consider Einstein's innovative path to general relativity as exemplifying an effective critical analysis of a physical theory. Finally, we will turn to developments in the field of cosmology after Einstein leading to the acceptance of the "big bang" theory.

**LEARNING OUTCOMES**

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

1. Demonstrate they understand the physical concepts introduced by Einstein and how these concepts apply to the world.
2. Characterize the problems Einstein confronted, and how he resolved them by rethinking basic concepts with his distinctively "philosophical" approach to science.
3. Perform critical reflection on how modern physics impacts our understanding of the universe and our place in it.
4. Improve analytical skills to critically assess science (in different senses), and to present these ideas in writing.
5. Apply critical reflection on the development of science and the impact of dramatic changes in our understanding, based on Einstein's work as a case study.

## **COURSE SCHEDULE**

The course will be divided into three modules:

- Module 1 (weeks 1-4): It's About Time, how Einstein solved a puzzle regarding light by reconsidering the nature of time
- Module 2 (weeks 5-8): Gravity as Curved Spacetime, how Einstein created a new theory of gravity by changing physical geometry
- Module 3 (weeks 9-12): Einstein's Cosmos and the Big Bang, how Einstein created the new field of relativistic cosmology and why we now accept the big bang theory rather than Einstein's static universe

## **TEXTS**

The primary textbook for the course is an online book by John D. Norton, \*[Einstein for Everyone]([https://www.pitt.edu/~jdnorton/teaching/HPS\\_0410/chapters/](https://www.pitt.edu/~jdnorton/teaching/HPS_0410/chapters/))\*.

We will also read parts of the following papers and books, all posted to the Brightspace website:

1. Einstein (1905), "On the Electrodynamics of Moving Bodies" (translation by John Walker).
2. Appendix on special relativity, by Michel Janssen (from the \*Cambridge Companion to Einstein\* (2014)).
3. Selection from I. B. Cohen, \*The Birth of a New Physics\*.
4. Selections from Einstein, "On the Relativity Problem" (1914)
5. "Einstein's Role in the Creation of Relativistic Cosmology," by Chris Smeenk (from the \*Cambridge Companion to Einstein\*).
6. Selections from the correspondence between Einstein and De Sitter (from the \*Collected Papers of Albert Einstein, Volume 8\*).
7. Selections from \*The First Three Minutes\*, by Steven Weinberg (1977).
8. Selections from \*Cosmology for the Curious\*, by Delia Perlov and Alex Vilenkin (2017).

## **METHOD OF EVALUATION**

1. Regular formative assignments (20 %): (i) peer-reviewed short essay writing (10 %), assigned roughly bi-weekly according to the schedule above. Compar assignments will focus on developing writing skills for the final paper. (ii) Critical reflections (10 %): brief, critical response to the material we have covered.
2. Exams (40 %): midterm (15 %), in week 6, and final exam (25 %). Both consist of multiple choice, true / false, and short essay questions. A more detailed description of the exam, and sample questions, will be distributed two weeks prior to each exam.
3. Final Essay (35 %): roughly 2000 word final essay, due at the end of the term. The grading rubric and guidelines will be posted well in advance of the essay due date.

Late submissions: The short formative assessments are integrated with the coursework, and it is essential to keep pace and meet deadlines. These are flexible assessments: we will not accept late work, but we will automatically drop the lowest score for each type of assessment (for example, the mark for critical reflections will be based on the top 9 out of 10).

### **DEPARTMENT OF PHILOSOPHY POLICIES**

The Department of Philosophy policies that govern the conduct, standards, and expectations for student participation in Philosophy courses are available in the Undergraduate section of the Department of Philosophy website <http://uwo.ca/philosophy/undergraduate/policies.html> . It is your responsibility to understand the policies set out by the Senate and the Department of Philosophy, and thus ignorance of these policies cannot be used as grounds of appeal.

### **AUDIT**

Students wishing to audit the course should consult with the instructor prior to or during the first week of classes.

### **ELECTRONIC DEVICES**

No aids are permitted for the exams. Electronic devices of any kind (including calculators, cell phones and smart watches) are not permitted.

### **STATEMENT ON THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE (AI)**

In this course, students are permitted to use AI tools exclusively for information gathering and preliminary research purposes. These tools, if used appropriately, can enhance the learning experience by providing access to diverse information sources. However, it is essential that students critically evaluate the outputs and use of this tool, exercise independent thinking, and engage in original research to synthesize and develop their own ideas, arguments, and perspectives. The use of AI tools can serve as a starting point for exploration; however, students are expected to uphold academic integrity by appropriately attributing all sources and avoiding plagiarism. **Assignments should reflect the students' own thoughts and independent written work.** By adhering to these guidelines, students contribute to a responsible and ethical learning environment that promotes critical thinking, independent inquiry and allows them to produce original written contributions.

If plagiarism or unauthorized AI use is suspected, the instructor will ask for research notes and/or drafts of assignments after the assignment has been submitted. If the students use generative AI tools, these research records must include a transcript of their interactions with the LLM or other tool they have used. Students must keep all notes and first drafts until the assignment is returned to them.

### **ACADEMIC ACCOMMODATION AND ACCESSIBLE EDUCATION**

Academic Accommodation is “a means of adjusting the academic activities associated with a course or program of student in order to permit students with disabilities to participate in those activities at the University and to fulfill the essential requirements of a course or program.” <https://www.uwo.ca/univsec/pdf/academicpolicies/appeals/Academic%20Accommodationdisabilities.pdf>. Students with disabilities are encouraged to register with Accessible Education at

the earliest opportunity. “Accessible Education plays a central role in Western's efforts to ensure that its academic programs are accessible for all students”

<http://academicsupport.uwo.ca/accessibleeducation/index.html>

### **SPECIAL EXAMINATIONS**

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

### **ACADEMIC CONSIDERATION**

Students may request academic consideration in cases of extenuating circumstances – that is, personal circumstances beyond the student’s control that have a substantial but temporary impact on the student’s ability to meet essential academic requirements.

1. Requests for academic consideration are made to the Academic Advising office of Faculty in which the student is registered.
2. Requests for academic consideration include the following components:
  - a. Self-attestation signed by the student;
  - b. Indication of the course(s) and assessment(s) relevant to the request;
  - c. Supporting documentation as relevant

Requests without supporting documentation are limited to one per term per course.

Documentation for medical illness, when required, includes the completion of a [Western Student Medical Certificate \(SMC\)](#) or, where that is not possible, equivalent documentation, by a health care practitioner. Requests linked to examinations scheduled by the Office of the Registrar during official examination periods as well as practice laboratory and performance tests typically scheduled in the last week of term always require formal supporting documentation.

### **Policy on Academic Consideration – Undergraduate Students in First Entry Programs**

#### **RELIGIOUS ACCOMMODATION**

Western’s Policy on Accommodation for Religious Holidays can be found here:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_religious.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf).

In the case of mid-term tests, notification is to be “given in writing to the instructor as early as possible, but not later than **one week** prior to the writing of the test”.

## **COURSE ASSIGNMENT**

The last day of scheduled classes in any course will be the last day on which course assignments will be accepted for credit in a course. Instructors will be required to return assignments to students as promptly as possible with reasonable explanations of the instructor's assessment of the assignment.

## **SCHOLASTIC OFFENCES**

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)

## **Statement on the use of plagiarism-checking software**

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>).

## **ACADEMIC ADVISING**

Your Home Faculty's Academic Advising Office will support or refer whenever you have an issue that is affecting your studies, including information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters. Do not hesitate to reach out to them if you are struggling and unsure where to go for help. Contact info for all Faculties is here:

[https://registrar.uwo.ca/faculty\\_academic\\_counselling.html](https://registrar.uwo.ca/faculty_academic_counselling.html)

## **MENTAL HEALTH SUPPORT**

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help. Immediate help in the event of a crisis can be had by phoning 519.661.3030 (during class hours) or 519.433.2023 after class hours and on weekends (24/7 availability).

## **GENDER-BASED AND SEXUAL VIOLENCE**

Western University [is committed to reducing incidents of gender-based and sexual violence](#) (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website:

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html). To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

