

Physics

STUDY ABROAD INFORMATION FOR PHYSICS STUDENTS

Physics is a universal science, available for study not only across the globe but throughout the cosmos. It is also an international discipline, studied on every continent (including Antarctica). Modern physics is highly collaborative, requiring a remarkable amount of teamwork. In the 21st century, most physicists work with scientists from around the world. Though the medium of communication for physics is often English, each member of a scientific team brings a lifetime of cultural norms and expectations to a project. The success of international collaborations may depend on your ability to understand and work with these differences in culture. Studying abroad at a foreign university as a Physics major can give you first-hand experience with other cultures and opportunities to meet new colleagues. While doing this, you can also fulfill concentration requirements, perfect a second language, and enhance your sense of physics as an international discipline.



The U-M Office of International Programs (OIP) administers programs in over thirty countries, and many of these programs offer significant coursework in physics. Students participating in OIP programs earn in-residence credit, are eligible to use U-M awarded financial aid and scholarships toward program costs, and may fulfill general and concentration requirements with courses taken abroad.

GETTING STARTED

1.) Plan early: Talk to your general and Physics concentration advisors about your interest in going abroad.	To meet with a Physics concentration advisor, please schedule an appointment through the on-line advising calendar: www.lsa.umich.edu/physics/undergraduate/advising
2.) Visit the OIP: Learn about program offerings and attend the OIP study abroad fair and information sessions.	OIP's Study Abroad Fairs: Fall Fair – Mid September Summer Fair – Mid January
3.) Narrow down your program options: Review course offerings and how they can satisfy concentration and distribution requirements.	See OIP's website: http://www.lsa.umich.edu/oip/oip-study-abroad.htm
4.) Research program costs: Review OIP information on program costs; learn about scholarship options and financial aid for which you may be eligible.	http://www.lsa.umich.edu/oip/financial.htm
5.) Apply for your program.	Online application: http://www.lsa.umich.edu/oip/applying.htm

FACTORS TO CONSIDER

Timing: The Department of Physics recommends concentrators study abroad as juniors, using courses taken abroad to fulfill elective requirements. Keep in mind that if you plan to study abroad (and take physics courses) in a country where courses will be taught in a foreign language that you will need an advanced level of language proficiency—at least four semesters of college-level language. (For some programs, six semesters of language is the recommended minimum.)

“Physics is a truly international discipline, and studying or performing research abroad provides a wonderful opportunity for students to become part of this international community.”
~ U-M Physics Professor

Satisfying distribution and general LSA requirements with courses taken abroad:

- ◆ **Distribution Credit** – To use a course or courses taken abroad to satisfy Humanities, Social Science, Natural Science, or another distribution category, you should meet with your LSA advisor before going abroad. Take detailed course descriptions or as much information as you can gather to the advising appointment. If you are unable to get this information ahead of time, or if your course elections change while abroad, bring back as much course information as you can, so that your advisor can effectively evaluate the course upon return.
- ◆ **Race and Ethnicity** – It is generally advisable to take R & E class on campus. However, if you want to use a course taken abroad to satisfy this requirement, you need to petition the LSA Academic Standards Board upon return. As part of your petition, you need to provide a syllabus for the course and write an argument explaining how you felt the course met the spirit of the requirement. Petition forms with the R & E criteria are available on the web or at the Newnan LSA Advising Center. Keep in mind that you may not be able to get a syllabus for the course, so you should bring back as much course information as you can—e.g. reading lists, coursepacks, papers, etc. If the syllabus and/or course materials are not in English, contact the Academic Standards Board to see if you need to have them translated. Board members can translate Spanish, French, and German.
- ◆ **Quantitative Reasoning** – To use a class taken abroad to satisfy the Quantitative Reasoning requirement, you need to petition the LSA Academic Standards Board

upon return. You need to present a course syllabus as well as materials showing the type of work done in the course (homework, quizzes, exams, and textbooks are helpful.)

- ◆ **Upper Level Writing Requirement** – It's extremely rare for a study abroad course to be approved for Upper-Level Writing. Generally these courses must be taught on campus by U-M faculty. If you want to request an exception, contact the Sweetland Writing Center, but keep in mind that such approvals are not likely granted.

Counting courses taken abroad towards Physics requirements:

Students should meet with a concentration advisor before going abroad to share information about course offerings at the host university and determine which level of class abroad matches Ann Arbor courses. At most universities abroad, students study a single subject, enrolling only in classes in that field while at university. In some instances, a second-year course abroad may be comparable to a 300-level course here, while in other instances, a third- or even fourth-year course abroad may be equivalent. Discuss with your advisor course offerings in your field, how their content compares with U-M courses, and what background is needed to take those courses. Bear in mind that although course titles may seem equivalent, their content may not be identical and may have different pre-requisites from courses here. U-M Physics courses that have been successfully replaced by courses taken abroad include core subjects such as Quantum Mechanics, Classical Mechanics, Electricity and Magnetism, and Statistical and Thermal Physics. In addition, some students have found appropriate elective courses in topics such as optics, particle astrophysics, and cosmology.

Funding study abroad – Students who have financial aid through the U-M can apply their financial aid to any U-M programs.



ACADEMIC YEAR, TERM-LONG (FALL OR WINTER), SPRING AND SUMMER PROGRAMS

The Office of International Programs offers over 80 study abroad options. Credit from these programs appear on your U-M transcript as in-residence credit and can be used to meet any College requirements.



AUSTRALIA

UNIVERSITY OF MELBOURNE

Single semester or full year program. Relevant courses are offered in the Faculty of Sciences' Department of Physics.

UNIVERSITY OF NEW SOUTH WALES

Single semester or full year program. Physics courses are offered in UNSW' School of Physics.

CHILE

PONTIFICIA UNIVERSIDAD CATOLICA

Single semester or full year program, requiring five semesters (or more) of college-level Spanish. Relevant courses are offered in its Facultad de Física.

GERMANY

ALBERT LUDWIGS UNIVERSITÄT, FREIBURG

Full year only; requires four semesters of college-level German or the equivalent. A wide range of Physics courses is available in its Fakultät für Mathematik und Physik. The program requires four semesters of college-level German (or the equivalent).

GREAT BRITAIN

CAMBRIDGE AND OXFORD UNIVERSITIES

Full year or Winter semester. Individual tutorials/supervisions for Physics concentrators are arranged through selected colleges.

ST. ANDREWS UNIVERSITY

Full year or Winter semester. Courses are offered in its Department of Physics & Astronomy.

SUSSEX UNIVERSITY

Full year or Winter semester. For a list of courses at Sussex, see the listing for its Department of Physics and Astronomy.

UNIVERSITY COLLEGE LONDON

Winter term or full-year program. For courses at UCL, see its Physics and Astronomy Department.

"...the courses I took in St. Andrews either counted towards my physics concentration or as my LSA requirements. It is nice that the courses in St. Andrews are of comparable rigor and sophistication as the ones I take here in Michigan, although I also found a less heavy assignment load..."

~ Kimmy St. Andrews '07

SPAIN

UNIVERSIDAD DE SEVILLA

Academic year, Fall or Winter semester. The program requires five semesters of college-level Spanish (or more). For information about course offerings at the University's Facultad de Física, see the program's home website: <http://www.mcpsevilla.com>

OTHER INTERNATIONAL OPPORTUNITIES FOR PHYSICS CONCENTRATORS:

Research abroad: Many U-M faculty have on-going research projects with colleagues abroad, and students who are interested in working on such a project while studying abroad should speak with their U-M advisors about this possibility before leaving Ann Arbor.

Summer research opportunities: The National Science Foundation's Research Experiences for Undergraduates program (REU) provides funding for undergraduates to participate in on-going research projects. U-M's Physics Departments has such a program at CERN, the European Laboratory for Particle Physics, in Geneva, Switzerland. For more information about the CERN program, see <http://www.um-cern-reu.org/>

"I became integrated into the department and learned a lot about physics education and research in England and how physics communities differ across institutions and nations. I think international and intercultural experiences are very important to undergraduate education and especially to physics because the field is so global."

~ Liz O.

Sussex '07

Study at non-U-M programs:

FRANCE

[ECOLE POLYTECHNIQUE, PARIS](#)

Full year only; requires six semesters of college-level French or the equivalent. Courses for physicists are offered in its Département de Physique. <http://www.polytechnique.fr/>

GREAT BRITAIN

[IMPERIAL COLLEGE, LONDON](#)

Full year or Winter semester only. The Department of Physics at the University of London's Imperial College of Science, Technology, and Medicine ranks high in both teaching and research. <http://www.imperial.ac.uk>

