

Mathematics

STUDY ABROAD INFORMATION FOR MATHEMATICS STUDENTS

Mathematics is an international discipline, whether studied in English, Arabic, or German. Studying abroad at a foreign university as a Mathematics major provides students with opportunities to meet colleagues, fulfill concentration requirements, perfect a second language, and gain a sense of mathematics as an international language. Regardless of your sub-field--Pure, Honors, Actuarial and Financial Mathematics, Mathematical Sciences, or a Teaching Certificate--or career goals, study abroad can enrich your undergraduate education while at the same time enabling you to fulfill degree requirements. You may learn how business norms vary from one culture to another, how different financial systems are structured and function, and how mathematicians view themselves and their field through the lens of another culture and language.

The U-M Office of International Programs (OIP) administers programs in over thirty countries, and many of these programs offer significant coursework in Mathematics. 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 RC and concentration advisors about your interest in going abroad	To meet with a Mathematics concentration advisor, please contact the Undergraduate Office, 2084 East Hall, 763-4233, math-undergrad-office@umich.edu
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 Mathematics recommends concentrators study abroad as juniors and completed Mathematics 217 (Linear Algebra) or equivalent before going abroad. Students may spend one or two semesters abroad and use up to two courses per semester to fulfill concentration requirements. Keep in mind that because you will likely be taking math in the host country language you will need advanced language proficiency — at least four semesters of college-level language. (For some programs, six semesters of language is the recommended minimum)

"Studying abroad was my single best experience during college. Not only did I enrich my understanding of other cultures... I learned more about how I want to live and who I want to be."

~ Former OIP Participant

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


Mathematics requirements: Students need to meet with a concentration advisor before going abroad to share information about course offerings at the host university and identify courses most suitable for your sub-field in Mathematics. You need to discuss with the advisor course offerings in your field, how 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, content may not be identical and may have different pre-requisites from courses here. At many universities abroad, students are specialized in their studies, taking courses in a single discipline from their first term and follow a very structured program of study. Requirements that may be satisfied with courses taken abroad include Probability, Analysis, Geometry, Differential Equations, Modern Algebra, and Discrete Math.

Funding Study Abroad – Mathematics majors may apply to the department for funding to study abroad; those who wish to be considered for the scholarships should contact the Chair of the Undergraduate Scholarship Committee (math-undergrad-office@umich.edu).



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.

<p>AUSTRALIA <u>UNIVERSITY OF MELBOURNE</u></p> <p>Single semester or full year program. Relevant courses are offered in the Faculty of Sciences' Department of Mathematics.</p>	<p><i>"Studying abroad is definitely the best decision that I've made in college... in general, studying math abroad is pretty difficult not only due to the coursework but the fact that you are learning these difficult concepts in a foreign language... I made friends with some German students in the class and worked with them on the homework, which was mutually beneficial... I had a learning experience, although very trying at times, that I will never forget."</i></p> <p><i>~ OIP Germany Participant</i></p>
<p>EGYPT <u>AMERICAN UNIVERSITY IN CAIRO (AUC)</u></p> <p>Single semester or full year program, with coursework taught in English. AUC's School of Science and Engineering offers relevant courses in its departments of Actuarial Science and Mathematics.</p>	
<p>GERMANY <u>ALBERT LUDWIGS UNIVERSITÄT, FREIBURG</u></p> <p>Full year only; requires four semesters of college-level German or the equivalent. A wide range of Mathematics courses is available in its Fakultät für Mathematik und Physik.</p>	
<p>GREAT BRITAIN <u>CAMBRIDGE AND OXFORD UNIVERSITIES</u></p> <p>Full year or Winter only. Individual tutorials/supervisions for mathematics concentrators arranged through selected colleges.</p> <p><u>ST. ANDREWS UNIVERSITY</u></p> <p>Full year or Winter semester. Courses offered in pure and applied mathematics.</p> <p><u>LONDON SCHOOL OF ECONOMICS (LSE)</u></p> <p>Full year only. Emphasis is on Applied Mathematics and Statistics.</p> <p><u>UNIVERSITY COLLEGE LONDON</u></p> <p>Full year or Winter term. UCL's Mathematics Department is highly ranked in both pure and applied mathematics.</p>	
	<p>JAPAN <u>UNIVERSITY OF TOKYO AND UNIVERSITY OF KYUSHU</u></p> <p>Year-long programs only. While not a specific focus of the existing study abroad programs through OIP, mathematics is offered as part of regular university curriculum at both universities. Students must be native level speakers of Japanese to take these classes.</p>
	<p>SPAIN <u>UNIVERSIDAD COMPLUTENSE DE MADRID</u></p> <p>Winter semester only; program requires six semesters of college-level Spanish or the equivalent. Program is through IES Abroad; on-site program director is faculty member in the department of Ciencias matematicas at Complutense.</p>
	<p>TURKEY <u>BOĞAZIÇI UNIVERSITY, ISTANBUL</u></p> <p>Full year or single semester. Courses are taught in English; Department of Mathematics offers a broad range of courses in pure, applied, and actuarial mathematics.</p>

NON-MICHIGAN PROGRAMS FOR MATHEMATICS CONCENTRATORS:

The universities listed below offer significant coursework of interest to Mathematics concentrators. They are not formally administered by the OIP, and thus students considering these options would apply directly to the host university, receive transfer credit, and not be eligible for financial aid awards through the University of Michigan.

FRANCE

ECOLE POLYTECHNIQUE, PARIS

Full year only; requires six semesters of college-level French or the equivalent. Courses for mathematicians are offered in the departments of Mathematics and Applied Mathematics. <http://www.polytechnique.fr/>

HUNGARY

BUDAPEST SEMESTERS IN MATHEMATICS

Fall or Winter semester. Program is designed exclusively for Mathematics students; applicants must have completed one semester of advanced calculus or abstract algebra by start of program. Courses are taught in English. Additional course work in humanities and Hungarian language also available. <http://www.stolaf.edu/depts/math/budapest/>

FOR ACTUARIAL SCIENCE:

- **Australia:**
 - Macquarie University, Sydney. <http://www.ulaval.ca/>
- **Canada:**
 - Université Laval, Quebec. All courses taught in French. <http://www.ulaval.ca/>
- **Great Britain:**
 - Heriot-Watt University, Edinburgh. <http://www.hw.ac.uk/>
- **Mexico:**
 - Universidad Anahuac, Mexico City. All courses taught in Spanish. <http://www.anahuac.mx/>

