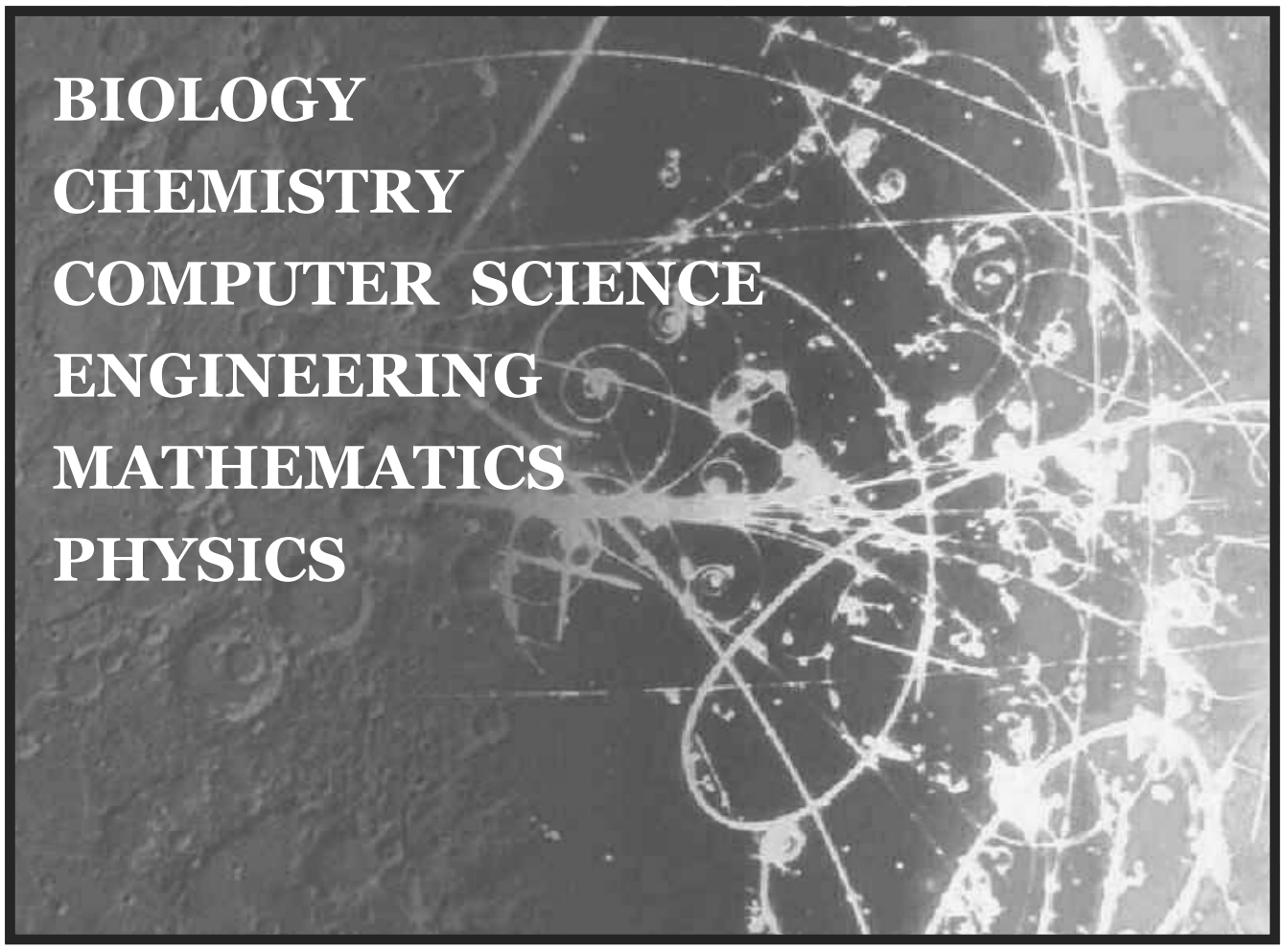
Studying Abroad as a SCIENCE CONCENTRATOR



BROWN

OIP

Office of International Programs

TABLE OF CONTENTS

INTRODUCTION

Everyone knows it's easy for those humanities people to study abroad. Going to France isn't a big deal when your concentration in French Studies requires eight courses and the French department is more than happy to give you two of them for studying abroad. As a science concentrator, you just need to plan ahead a bit more in order to get abroad. This booklet will demystify the study abroad options for concentrators in BIOLOGY, ENGINEERING, PHYSICS, MATHEMATICS, COMPUTER SCIENCE and CHEMISTRY. It's up to you and your schedule how many science courses you decide to take while abroad. As you do some research on these programs, you'll soon figure out which is the best fit for you. We've gathered information from both departmental advisors and our OIP Resource Library to provide you with a starting off point for your study abroad search.

So glance through this booklet, look through materials in the Resource Library and the science binder, and then chat with your concentration advisor and OIP staffers about your options.

Have fun in your search.

QUICK REFERENCE:
SCIENCE STUDY ABROAD PROGRAMS

Biology:

- **Brown-in-Barbados**—All sub-specialties
- **Brown-in-Britain—Kings College, Imperial College, University of Lancaster, Oxford** or **Cambridge, University of Bristol** offer a variety of pre-med related courses such as physiology, zoology, biochemistry, genetics, chemistry, neuroscience etc.
- **Brown-in-France**—physiology, molecular and cellular neuroscience.
- **Brown-in-Denmark**—marine biology and ecology. The Medical Practice and Policy Program offers physiology, anatomy and health science courses.
- **Brown-in-Germany**
- **Brethren Colleges Abroad (India)-** Biological/Life Sciences
- **University of New South Wales**—All sub-specialties including ecology, environment, molecular biology, chemistry and physics.
- **University of Melbourne**—A broad range of scientific disciplines including genetics, anatomy, cell biology, ecology, marine biology, botany, zoology, biochemistry, molecular biology, physiology, neuroscience, pathology, pharmacology, microbiology, immunology, and conservation, supported by the physical sciences.
- **University of Western Australia**
- **University of Cape Town**—All disciplines
- **Universidad de San Francesco De Quito (Pitzer College in Ecuador**)—ecology and environmental biology.
- **Universidad de Costa Rica (University of Kansas at Golfito or San Jose**)—The Golfito program's focus is exclusively ecology, but the San Jose program has more offerings at the University of Costa Rica.
- **School for Field Studies** and **School for International Training**
- **Leiden University**

Chemistry:

- **Brown-in-Barbados**
- **Brown-in-Britain**—**University of Sussex**, **Queen Mary**, **Oxford** or **Cambridge** are strongly recommended for chemistry courses.

- **University of Melbourne**—Chemistry at all year levels, including introductory subjects for those who have never studied chemistry as well as more advanced courses in the range of organic, bio-organic, inorganic, bio-inorganic, physical and analytical chemistry are available and most include lab components.

Physics and Engineering:

- **Brown-in-Barbados**
- **Brown-in-Britain—Manchester, University of Strathclyde** and **University of Leeds** are all first-rate. In London, you'll find the most opportunity at **UCL**. **University of Bristol** and **University of Glasgow** offer a wide array of physics and engineering courses.
- **Brown-in-Denmark-** Engineering, mathematics, and physics.
- **Brown-in-Ethiopia**
- **Brown-in-France**
- **Boston University**
- **University of Limerick**
- **University of Melbourne-** Traditional engineering courses such as chemical, civil, electrical and electronic, geomatics, mechanical and manufacturing. Also, environmental courses, computer science and software engineering and mechatronics. Physics courses, such as optics, astrophysics, quantum mechanics, mathematical physics, thermal physics and electronics.
- **University of Queensland**
- **Budapest Semesters in Mathematics**—Mathematics, applied mathematics and physics subspecialties.
- **Middle East Technical University-** Engineering, chemistry, mathematics and physics
- **National University of Singapore**

Health Related Programs:

- **Brown-in-Denmark**—Medical Practice and Policy Program
- **CIC Program** in the Dominican Republic
- **Pitzer-in-China Program**—Traditional Chinese Medicine
- **University of Melbourne**—Medical, biomedical, and health related subjects.

BIOLOGY

It's relatively easy to study abroad as a Biology concentrator. According to Dean Thompson, integrating study abroad into one's four year plan is definitely doable and if anything adds to one's experience as a biology concentrator.

Credits for study abroad in Biology are either specified or unassigned. If a course matches a Brown course well, the credit will be assigned and thus it can replace a specific course at Brown. Dean Thompson encourages you to talk to her because even when a course isn't offered here, the department will often still approve the course for concentration credit. Study abroad is a wonderful opportunity to get the *required* courses in ecology or evolutionary biology out of the way even if your primary focus is molecular biology or biochemistry.

Biology concentrators often seek out laboratory credit abroad and Physics courses abroad. If you get approval for class with a lab, then that lab credit will be recognized. You'll note that three lab courses are required for biology concentrators. If you feel you must take a physics course junior year, see some of the physics options under the PHYSICS section. Remember that it's not always necessary, especially if you can accommodate a semester of physics in the summer or in your sophomore year. The biology department advises Pre-med students *against* taking physics at a foreign institution.

(For AB students the maximum number of courses that can transfer for CONCENTRATION CREDIT IS FOUR. For ScB students it is about FIVE or SIX. This is usually more than enough!)-----what?????

Organizing a research project for your senior year (required for ScB students) presents a challenge if you are gone during the second semester. Ideally you should look up some names of faculty you might want to work with before you leave campus. Otherwise email various professors from abroad and explain that you are interested in a research project for the following year. If you wait until the beginning of senior year, you will have very limited selection.

Program Recommendations:

BROWN-IN-BARBADOS

University of the West Indies, Cave Hill

At the University of the West Indies you will have full enrollment privileges in the faculties of Natural Sciences as well as in General Studies. For Biology concentrators, we can also get special permission for you to stay on in summer to do a field research course. UWI also has a specialty focus in Marine Biology. The system is modeled after the British Educational System, and all courses are taught in English. The faculty of Natural Sciences offers many courses in Biology, including courses with labs, as well as chemistry and physics courses for Biology prerequisites or related sciences. The yellow "Faculty of Science and Technology" handbook has nice concise course descriptions of various courses that are usually offered. This booklet makes a good place to start when requesting concentration credit from advisors. Another good source is U. Cave Hill's Department of Biological and Chemical Sciences web site: **http://scitec.uwichill.edu.bb/bcs**, which contains summaries and even lecture notes of its course offerings.

It is always a good idea to be flexible and have a range of courses that you can take but if you need a specific course, we must check in advance whether this will be offered the semester you will be there.

BROWN-IN-BRITAIN

Britain is a good bet for getting concentration courses easily approved, but don't limit yourself to only Britain. There are lots of English language program programs in other countries. Nevertheless, the UK is a great place to go.

King's College

London, UK

King's offers extensive life-science courses. Generally students can study in one or two departments, meaning life sciences and one other. Also look at courses that could satisfy the physical science cluster, or related sciences, as there are both physics and chemistry courses with labs offered.

Imperial College

London, UK

Imperial College has several special Junior Year Abroad Programs, including the life sciences. The biology program allows students a broad choice of biology courses similar to those required for a Brown degree, including biochemistry, plant sciences, zoology, etc. This institution offers only sciences, no other subjects available.

University of Lancaster

Lancaster has almost all of the core biology courses for visiting students including biochemistry (semester or year), genetics, microbiology, animal physiology, organic chemistry, and physics. Lab work is available.

Oxford and Cambridge

Studying science at Oxford or Cambridge shouldn't be too problematic in terms of receiving Brown credit. It is important to list the courses you need as well as any lab components needed on your Brown-in-Britain application. Almost any major can be accommodated at Oxford and Cambridge. The best resource we have is Courtney Voelker's guide entitled "A Visiting Students Guide to Studying Science at Oxford".

One negative aspect at both Oxford and Cambridge is that you are only allowed to take one subject.

University of Bristol

There are lots of science programs at the University of Bristol, including a strong neuroscience department. Researchers at this university conduct some of the latest neuroscience research in the UK. A program overview and course descriptions can be located at Bristol's School of Biological Sciences website: **http://www.bio.bris.ac.uk/**

BROWN-IN-FRANCE
Paris VI
Paris, France
The Pierre et Marie Curie, Paris, VI in Paris is the best option for studying any science in Paris. Under the Brown agreement with the French university, all students should have access to the science classes offered through Paris VI. These courses include: organism biology, physiology, molecular and cellular biology, physics, chemistry, and neuroscience (see the Paris VI binder in the OIP library for fairly detailed course descriptions). Psychology is at Paris VIII. On the Paris program students are generally enrolled in two different universities, so a science student could potentially take one or two science courses and one or two humanities courses while abroad. Remember that Brown requires through French 60 to go abroad in a French-speaking country, and it might be slightly more intimidating taking science courses in a foreign language, where you are responsible for understanding information in the lectures.

Contact an OIP advisor once your application to France is complete for further course selection steps.

BROWN-IN-DENMARK
DIS Program
Copenhagen, Denmark
This program is highly recommended for Biology Concentrators and pre-meds. There is an incredible program called the Medical Practice and Policy Program, that although geared towards pre-meds, can almost certainly carry concentration credits (see the pre-medical section). Entrance into the program requires some science background. DIS also offers extensive marine biology and ecology courses, which could be credits you need for your concentration anyway. There is the possibility to take courses from both the Medical Practice and Policy Program as well as the Marine Ecology courses. See the "Study Abroad in Copenhagen—In English!" catalog for the course descriptions.

There's also a new Molecular Biology and Genetics (MBG) program. You need to have had a molecular biology course, with lab experience to get into this program. The fall program is primarily an analysis of cell differentiation and the spring semester is focused on interpreting and identifying DNA sequences. You take these core courses in addition to two or three elective courses from the Medical Practice & Policy (MPP), Environmental Biology (EB), or Humanities & Social Sciences (HSS) programs. Or, if you want, you can co-enroll in the MPP program or the EB program.

Additionally, each of the programs usually involves a "Study Tour" to places in Russia, Poland, and other Eastern European destinations. Everything is taught in English, Copenhagen is a beautiful and lively city, and the program comes highly recommended by Brown faculty.

BROWN-IN-GERMANY
Humboldt-Universitat zu Berlin
Berlin, Germany
There's a new Biological Technologies course that adds to the strength of the Biology department at Humboldt. One of the department's focuses is molecular research. The Chemistry, Physics, and Computer Science departments also offer a wide array of courses for the science concentrator.

UNIVERSITY OF NEW SOUTH WALES
Sydney, Australia
This is the most popular study abroad destination for biology concentrators, and receiving credits should be no problem since the Australian system of higher education is very similar to that of the United States. There are courses in biochemistry and molecular biology as well as excellent offerings in ecology. Best of all, most courses have a lab component if you want to get one of those lab credits while abroad. There are also numerous chemistry and physics courses if you want to use some of these for a physical science cluster (ScB only).

Even though taking science is very easy, the wonderful thing is that you are not limited to only science courses. The best place to look at course listings to propose to Dean Thompson and your concentration advisor is in the UNSW Study Abroad Guide. This is available in the OIP library, and provides pretty good course descriptions.

On a similar note, also check out the Butler Programs in Australia and New Zealand. The University of Queensland has many courses in biology (marine and other fields) for example.

UNIVERSITY OF MELBOURNE
Melbourne, Australia
The Australian University system is very similar to that of the United States in that students are not limited to a specific department, the courses follow a similar instructional pattern, and most importantly, courses are in English. The University of Melbourne offers the widest range of scientific disciplines in Australia and has an excellent research reputation. For Biology concentrators the University has an excellent program covering a very broad range of biological and biomedical disciplines including genetics, botany, zoology, anatomy, cell biology, ecology, marine biology, zoology, biochemistry, molecular biology, physiology, neuroscience, pathology, pharmacology, microbiology and immunology as well as environmental and biotechnology subjects. The unique flora and fauna of Australia are incorporated into a suite of subjects offered in botany, zoology and marine biology which are often supported by laboratory work in the field. The University also has a marine environmental research station on the bay. Lab subjects are a vital component of most subjects.

Pre-clinical disciplines available are: anatomy and cell biology, biochemistry, microbiology, neuroscience, pathology, pharmacology and physiology.

Almost any course in the biological sciences across the Faculty of Science and the Faculty of Medicine, Dentistry and Health Sciences will receive a concentration credit.

UNIVERSITY OF WESTERN AUSTRALIA
Perth, Australia
This place has a strong Anatomy and Human Biology department. They describe themselves as taking a “holistic view of biology of human populations and individuals.” The University of Western Australia (UWA) offers a wide variety of courses at the undergraduate level in the Faculty of Engineering, Computing and Mathematics, the Faculty of Law, the Faculty of Life and Physical Sciences and the Faculty of Natural and Agricultural Sciences.

UNIVERSIDAD DE SAN FRANCESCO DE QUITO
Pitzer College in Ecuador

Quito, Ecuador (petition program**)**

Obviously Spanish is a prerequisite for this program, as students are allowed to enroll in all regular USFQ courses. As far as biology options, past participants seemed to focus on environmental science and ecology. However, with the supplemental trips to the Amazon and the Galapagos Islands, this is a great way to fulfill that ecology requirement while taking a variety of other courses. Remember that this is a *petition program*, and (as with any other program) you should definitely discuss concentration credits with Dean Thompson prior to petitioning. The course catalog is available in the OIP Resource Library.

UNIVERSIDAD DE COSTA RICA
University of Kansas

San Jose, Costa Rica

As part of the San Jose orientation program you will take Spanish language courses and then you will enroll at the University of Costa Rica. Program participants have access to most of the university's departments including ecology, microbiology, medicine, and zoology. However, it seems unlikely that the courses will match up exactly to Brown courses, or that they will have the required lab components, (they are also all in Spanish), so it is important to be flexible and discuss what kind of credits you will receive with Dean Thompson before going. But if you only need one or maybe two nonspecific biology courses, there is a good chance you will receive credit.

UNIVERSITY OF CAPE TOWN
CIEE Program
Capetown, South Africa (petition program)

Besides being in a fabulous location, the program allows a wide variety of courses including botany, biochemistry, nutrition, physics, microbiology, and zoology. Additionally, there is no limit to the number of faculties students can attend courses in. For example, one could take "Microbiology" and "Studies of the Religious Traditions of Africa."

SCHOOL FOR FIELD STUDIES
SCHOOL FOR INTERNATIONAL TRAINING
Various international sites

For many SFS and SIT programs, your courses will be taught in English and your classmates will be mostly Americans. As an integral part of both of these programs, you design and conduct an independent study project. You should look for science oriented programs in Australia, Africa and South-America. Please consult "The FAQs of Study Abroad" for a list of Approved Alternative programs and then also read over the colored inserts in the SFS and SIT catalogues for descriptions of concentration credit possibilities.

LEIDEN UNIVERSITY
Leiden, Netherlands
Leiden University has the Biomedical Science program you've been looking for. You take courses that focus primarily on homeostasis, neuroscience, immunology and endocrinology at the Leiden University Medical Center. You'll notice that this program is only offered in the spring. If you've worked in a lab before and you want to do research in the Netherlands, you can work on a research project for one or two semesters. So you think this might interest you? Check out www.leiden.edu for more exciting information.

CHEMISTRY

The few chemistry concentrators who study abroad each year who plan to take science courses usually go to an English speaking university, either in the UK or in Australia. However, many students prefer to get ahead in their chemistry studies before leaving Brown and take non-science courses while abroad.

How credits are assigned depends mostly on the destination. The principle difficulty with chemistry students studying chemistry abroad is that the American curriculum is quite different from that of most European universities. Americans tend to concentrate on one aspect of chemistry—whereas European universities tend to cover all sub-fields in each year's course, successive years dealing with more and more advanced topics. This means there are two hurdles for an American chemistry student: year versus semester courses and different modes of specialization. These problems are less severe in the UK and Australia.

Professor Rieger reports that students have had good experiences in chemistry courses at the University of Sussex and Queen Mary College. The students who spent time at these institutions had no trouble finding courses that meshed with their Brown backgrounds, and they had no trouble finding equivalent Brown courses for credit purposes. Just as an aside, the worst reported experience was at the University of Lancaster, where the chemistry curriculum does not correspond with the Brown curriculum.

In the past, the issue of laboratory credits has not arisen, mostly because UK and Australian universities give students laboratory experience equal or better than what is available at Brown.

Program Recommendations:

BROWN-IN-BARBADOS
University of the West Indies
Cave Hill, Barbados
The curriculum of the University of the West Indies follows a British educational system. You are fully enrolled in all of the faculties and you take your courses in English. You'll need to be flexible in your course selection, but you can get an idea of the courses offered by looking at the course descriptions in the yellow "Faculty of Science in Technology" catalogue. Barbados is a gorgeous place to sit back and open up your mind to some fascinating Chemistry courses.

BROWN-IN-BRITAIN
University of Sussex
Brighton, UK
You will find a wide array of Math and Chemistry courses at Sussex. The Chemistry department is well known for its research, especially in organometallic chemistry, polymer science and medicinal chemistry. The lively town of Brighton is right on the water and just a few minutes away from campus.

Queen Mary College at University of London
London, UK
This is the program of choice for those of you who want to be in London. At Queen Mary it is possible to take courses from more than two departments, however, it is not recommended. Generally students would enroll at the department of chemistry and one other department (scientific or non-specific).

Oxford and Cambridge
Oxford and Cambridge are slightly more competitive in terms of acceptance rates than other British schools. There shouldn't be a problem receiving Brown credits for chemistry tutorials (Oxford and Cambridge work on the tutorial system), however, it is very important to list the specific courses you will need on your course choice form and SPECIFY ANY LABS you might need to complement your course choices.

UNIVERSITY OF MELBOURNE
Melbourne, Australia
The Australian University system is very similar to that of the United States in that students are not limited to a specific department, the courses follow a similar instructional pattern, and most importantly, courses are in English. The University of Melbourne's offerings in Chemistry span the traditional areas of organic, inorganic, physical and analytical chemistry. The School of Chemistry also offers subjects in bio-organic and bio-inorganic chemistry, as well as molecular technology and processes. Many of the subjects offered at each year level include a lab component, and there is a Chemical Research Project offered for students interested in developing their research and project management skills.

PHYSICS, ENGINEERING and COMPUTER SCIENCE

Not to carelessly throw physics and engineering into the same category, but many of the specialized engineering programs have physics offerings, and both physics and engineering have a mathematical component to their degree requirements that can be fulfilled while studying abroad.

Typically one or two physics students study abroad in their junior years. England is a popular destination, though students have also gone to Israel, Australia and Barbados. Many students have taken a semester abroad without studying any physics, but Professor Pecovits acknowledges that this would be difficult to do for a full year. Most credits the physics department awards are assigned, including laboratory credits. None of the junior level lecture courses have labs. However, there is one separate lab course that can be taken at a foreign institute, or could easily be taken during their senior year back at Brown. The physics degree does allow for some flexibility in course choices that can be used for study abroad purposes. For example, one could take a mathematics or applied math course while abroad, or a related science course (provided it is pre-approved by the concentration advisor).

The engineering department tends to be stricter about matching courses to Brown courses. Basically, a course-for-course substitution is looked for. The faculty member teaching the comparable course at Brown certifies the course abroad by writing a memo. Therefore, the student should get as much information as possible about the destination courses, such as catalog descriptions, syllabi, textbooks, and assignments. Usually in the "industrialized democracies" there is a good correspondence in engineering courses, because the material is rather standardized. With that said, it is easy to understand why England, Scotland and Australia are the most popular destinations, although alternatives are listed below. Professors Brian Sheldon and Roderic Beresford advise engineering students about studying abroad.

Completing computer science requirements abroad typically poses more of a challenge. The development of computer sciences as an undergraduate concentration in universities worldwide has not been a standardized affair, and has largely been guided by a university's postgraduate research interests. Nevertheless, many of the program options below do offer advanced courses in mathematics, informatics, programming languages, computer systems and even artificial intelligence that may be accepted for concentration credit. The OIP advises students with a computer science concentration interested in a semester abroad to thoroughly research course offerings for programs abroad at the OIP library and, equipped with course descriptions and degree plans at your chosen program abroad, work closely with their concentration advisor in Computer Science.

Program Recommendations:

BROWN-IN-BARBADOS
University of the West Indies
Cave Hill

Most students don't think of going to the Caribbean to study physics and engineering, but the Brown-in-Barbados program is a wonderful alternative to Britain or Australia. Students have access to all the faculties, which includes the Faculty of Engineering as well as General Sciences. The educational system is somewhat like the British system, but should allow some flexibility in choosing courses in several departments. The OIP library has the engineering course guide, but more updated course listings are posted on the University of the West Indies web-site.

BROWN-IN-BRITAIN

The **University of Manchester**, **University of Strathclyde** and **University of Leeds** got wonderful reports from Brown engineering faculty, and students are encouraged to look at these programs. Manchester is on a semester system, and housing is easy to find making a semester study abroad a good possibility. It is reported to have modern facilities, with a great electrical engineering program as well as a biological and biomedical engineering program. The University of Manchester Study Abroad Handbook (in the OIP library) has excellent descriptions of courses available. There are a huge number of engineering, physics, computer science and math courses available to study abroad students.

Leeds is also an excellent choice in all disciplines of engineering, math, and physics. These two programs should definitely be considered by Brown engineering and physics students because they have great course offerings, and also because students are not limited to enrollment in only one department. Leeds and Manchester are much more flexible in regards to course/departmental enrollment than the London schools. Besides, not being in London provides for a much more "British" experience.

University College London
London, UK

If your goal is to be in London, UCL is probably your best choice in terms of engineering departments. It is on a semester-like system, so the one semester study abroad program is an option. However, at UCL you will probably be limited to enrolling in two departments, which means engineering or physics and one other. Most of the physics and engineering courses have labs.

The Department of Medical Physics and Bioengineering at UCL is doing some of the latest research of its kind in the entire United Kingdom. The department works jointly with the UCL Hospitals Trust. Most of the laboratory work is done at local hospitals, so you'll probably be exposed to what it's like to work in the "real world." There is an extensive list of courses available each semester. You can find more information at **www.medphys.ucl.ac.uk**

University of Bristol
Bristol, UK

University of Bristol has a renowned computer science department. The area around Bristol has one of the largest concentrations of high technology industries in all of Europe. To take a pictorial tour of Bristol to see why you want to spend some time in there, go to **http://www.about-bristol.co.uk/** and you can also learn more about the university by exploring the website.

University of Glasgow
Glasgow, UK

Glasgow has a wide variety of courses offered in its Sciences program. Glasgow offers some unique courses in Bioelectronics in its Department of Electronics and Electrical Engineering. You can study there for either the full year or one semester.

BROWN-IN-DENMARK
DIS program
Copenhagen, Denmark

By partaking in the engineering program, you can take courses at the Technical University of Denmark while also taking humanities courses that the DIS program offers. You'll also have study tours and travel integrated into the program. You will have access to almost all the courses offered by the Engineering department, in addition to those in the Mathematics department and the Physics department.

BROWN-IN-ETHIOPIA
Addis Ababa University
Addis Ababa, Ethiopia

So you want cultural diversity and some good quality Physics classes? Ethiopia has it all. It has over 80 languages and a wide variety of cultures. And, Addis Ababa University, the oldest university in Ethiopia, has a hot Physics department. Look at the course descriptions filed in our Ethiopia binder in the Resource Library and you'll soon know exactly what we mean.

BROWN-IN-FRANCE
Paris VI
Paris, France

You have access to all the courses in Paris VI, including both Physics and Engineering. Almost all of the courses correspond to Brown offerings, such as Optics, Physics of Liquids, Physics of Solids, Mechanics, etc. Remember that you can enroll in two Paris universities, providing you with the opportunity to take both Science and Humanities courses. As I'm sure you know, you'll be taking these courses in French, so be sure that you are confident that your French ability will allow you to absorb detailed scientific explanations.

BOSTON UNIVERSITY
Dresden, Germany

This program is only open to sophomore engineering concentrators. The program only runs in the spring and provides a unique opportunity to take engineering courses in English and do an intensive German language immersion. The science and engineering classes are at Technische Universität Dresden and are all in English. You will choose three out of these five courses: Differential Equations, Electric Circuit Theory, Waves and Modern Physics, Linear Algebra, and Principles of Biology. All students also take The Social Nature of Technology.

UNIVERSITY OF LIMERICK
Limerick, Ireland (petition program)

At Limerick, students are allowed to choose courses in any of the six colleges including both the College of Humanities and College of Engineering. Most of the engineering courses are pretty

standard and it should not be too hard to find a corresponding Brown course. As far as study abroad in Ireland is concerned, Limerick is the best place to incorporate engineering courses. The Approved Alternative program at **Trinity College, Dublin** has an excellent engineering and physics department, however it is generally difficult to take courses in departments other than the one to which you are accepted.

UNIVERSITY OF MELBOURNE
Melbourne, Australia

The Australian University system is very similar to that of the United States in that you are not limited to a specific department, you take your courses in English and the courses follow a similar instruction pattern. The Faculty of Engineering has a truly international perspective and has led engineering education and research in Australia since 1855. Melbourne has the most comprehensive array of engineering courses ranging from bioengineering to aerospace mechanics, and all have the required laboratory component. When choosing your Engineering courses, look at 2nd year level subjects rather than 3rd year ones. Before taking 3rd year level courses, students have usually completed two full years of Engineering studies and thus have taken all the required prerequisites.

The University of Melbourne also has a very strong, internationally recognized Department of Physics with courses offered in Mathematical Physics, Quantum Mechanics, Astrophysics, Electronics, Thermal physics and Optics. Man courses offer lab work. There is an internationally recognized academic staff in most areas of physics. These staff conduct leading research projects while also remaining active in the teaching program.

UNIVERSITY OF QUEENSLAND
Queensland, Australia

This gorgeous campus is located right in the heart of the city of Brisbane and will tempt any study abroad student. There are many international students from over 90 countries. The university also offers 11 different Engineering programs. One that looks really cool is a mining engineering program where you can get hands on experience in a huge mine! So, to get even more tempted, go to the website, **www.uq.edu.au**, or look at the other information in the Resource Library.

BRETHREN COLLEGES ABROAD
Cochin, India (petition program)

This program offers a variety of science courses. Cochin University of Science and Technology is a leader in scientific and education research in southern India and it hosts the BCA Study Center. CUSAT offers 80 programs of study and a student to faculty ratio of 5:1. The instruction follows a US science format and is in English.

Dr. James Borgard, Assistant Professor of Physics at Juniata College, is the Academic Director of this program and teaches with BCA. Dr. Borgardt offered courses in Philosophy of Science and General Physics (with Physics Laboratory). Students may also participate in other Cochin University of Science and Technology courses. For information regarding CUSAT courses, please contact the BCA office a **www.bcanet.org**. You can arrange independent studies and tutorials as well.

BUDAPEST SEMESTERS IN MATHEMATICS

Budapest, Hungary

Although the Semesters in Mathematics program is primarily geared towards mathematics and computer science concentrators, Physics and Engineering or Applied Math concentrators would likely find mathematics courses that could be used to fulfill degree requirements. The program is very well renowned among mathematics faculty worldwide, and best of all, all courses are taught in English by Hungarian professors. Usually, students take three or four mathematics courses per semester (number theory, combinatorics, statistics, algorithms…see a sample list of courses in the brochure available in the OIP), and one of two humanities courses (including a Hungarian language option). There are also likely to be offerings in computer science and applied math, varying by semester, and can be checked on the web address-
http://www.stolaf.edu/depts/math/budapest (the program's US affiliate is St. Olaf College in Minnesota).

While all the course offerings sound great, there is also the additional advantage of being in Budapest, which is an absolutely amazing city. The living accommodations seem ideal and the cost of living and traveling in Hungary is extraordinarily *inexpensive.*

MIDDLE EAST TECHNICAL UNIVERSITY

Ankara, Turkey

All the courses at METU are taught in English, and the university specializes in the sciences. The Faculty of Engineering offers any kind of engineering subspecialty you could imagine, and the Faculty of Arts and Sciences includes chemistry, mathematics and physics. Stop by the OIP and check out METU's immense catalog of course offerings and the university's host city of Ankara, Turkey's capital.

NATIONAL UNIVERSITY OF SINGAPORE

The University in Singapore offers a lot of science courses and is particularly strong in engineering. You'll take all of your courses in English and each course has a corresponding lab. So if you are interested in studying in Asia, but with an American-style university, you might want to look into NUS. Singapore is a great base for traveling to Southeast Asia and Indonesia.

PREMEDICAL STUDIES ABROAD?

Studying abroad is a wonderful experience for most students, even Pre-meds. It can even make your application stronger as it shows you are independent, willing to take risks and have probably developed additional maturity and perspective while you are away. In addition, if you opt to take a year off after Brown, most students find this year to be a refreshing chance to catch their breath before beginning medical school.

The biggest challenge is finding the time to fit in the premed required courses, but don't despair! Premed Studies and Study Abroad are usually easy to combine with a little extra planning and some compromise. If you choose to attend medical school immediately after Brown, time becomes very tight. Because most Brown students (around 70%) take a year off before medical school they easily have the time to complete their undergraduate studies and study abroad for at least a semester.

Taking a year off after Brown does not change your interaction with the Health Careers Office, since all interviews and paperwork occurs before you graduate. Students are encouraged to develop a four-year plan with the Health Careers Office and the Premedical Advisor.

Taking premedical requirements abroad is generally discouraged but this is good news, since most students prefer to spend their time abroad studying language, history and exploring. Also, it is difficult to find foreign course work equivalent to the premed requirements expected by US medical schools. There are some great biology programs in such places as Denmark, Germany, and Australia.

Here's how:

If you want to go to medical school immediately after Brown, you must start your chemistry sequence in your first year at Brown. With your chemistry well underway, the easiest way is to go abroad for the first semester of your junior year as long as you take Physics 3 in summer school before you leave. Upon your return, you can complete Physics 4 in the MCAT and put your applications in that summer.

If you plan to be abroad for the second semester of junior year or for all of junior year, it is much easier to plan to take a year off after graduation and apply to medical school at the end of senior year. Students who are away for second semester junior year normally take Physics 4 and do the MCAT in the summer after returning from abroad, though the MCAT can be taken the next spring if you don't mind the conflict with your thesis.

If you insist on entering medical school immediately after senior year and still want to go away in the second semester or all of junior year, it means completing the premedical requirements by the end of sophomore year. This means taking Chem 36 and Physics 3 in the first semester of sophomore year and Physics 4 and the MCAT that spring (or the MCAT in the summer before you leave to go abroad). An obvious danger is overloading before you know you want to be a doctor. It really doesn't make sense to try to do the MCAT while you are abroad as it would use up virtually all of your free time.

Though most of you will not take premedical requirements abroad, there are a number of programs which offer medically related courses. The **DIS program in Medical Practice and Policy** in Copenhagen got excellent reviews from Dean Ripley. The **CIC Health Program** in the

Dominican Republic focuses on health care in a developing country, but has gotten mixed reviews from students. There is also the **Pitzer College Chinese Program** in Beijing, which has a course in Traditional Medicine. This program allows students to visit local hospitals and do a health related independent study project, and has gotten favorable reviews from students (including premed students). British institutions, such as Kings College, London offers a number of science courses useful to premed students. Be sure to check out the above descriptions of science programs.

Program Recommendations:

UNIVERSITY OF MELBOURNE
Melbourne, Australia

Students may enhance their degree and strengthen their medical, pre-medical or health sciences program in the States by participating in the Biomedical and Health Sciences Study Abroad Program at the University of Melbourne. This dynamic, challenging program offered to study abroad students by the Faculty of Medicine, Dentistry and Health Sciences allows students to enrol in subjects in the areas of pre-clinical medicine, biomedical sciences, science, physical therapy, psychology, nursing, health science, medical ethics and anthropology, and many more.

There is an increasing demand for medical and health practitioners to have highly developed intercultural skills. Students will find that the international perspective they gain through a semester's study overseas will benefit them for the length of their careers. During a semester or year in Australia, students will develop a deeper appreciation of the transcultural experience - an increasingly important perspective for all health practitioners, and a great assistance in building an international network.

A wide range of subjects in the following disciplines are available: anatomy (human), biochemistry and molecular biology, biomedical and health ethics, biotechnology, cell biology, epidemiology and biostatistics, health care history, immunology, issues in health practice, medicine (pre-clinical), medical anthropology, medical science (research), microbiology, neuroscience, nursing, pathology, pharmacology, physical therapy/ physiotherapy, physiology, psychology, social issues in health, and women's and gender health issues.

Medical Research

The Advanced Medical Science (AMS) program provides an introduction to the processes of research work in a field related to medicine, including critical appraisal of the literature. It aims to inculcate you with lifelong patterns of learning by developing independent skills in research and an understanding of the place of research in medicine; to enhance oral and written communication skills; and to encourage further learning in areas of relevance to medicine.

You will acquire skills in the acquisition, evaluation and application of information (evidence) by undertaking in depth studies in an area of choice related to medical science. This year also allows students to explore an area in depth and to broaden their experience of health care and research. They will learn not only the theory behind evidence and research, but will also experience it first hand and appreciate its difficulties and limitations. Students will also have great opportunities to interact with researchers and better appreciate their role in the advancement of medical science.

There are over 80 different research areas from which to choose. The list is diverse and exciting. Projects can be in areas ranging from social science and ethics through population health and laboratory research to clinical research on cutting edge therapies. The University of Melbourne is Australia's leading medical research university, and is surrounded by a number of world-renowned research institutes. These institutes are active hosts of AMS units, and provide outstanding research opportunities.

Units vary in structure, ranging from 100% research to one-third research and two-thirds coursework. Coursework may be tailored to specific project needs, allowing students to gain advanced skills in the area of research, and to apply those skills in their research project. Each semester is comprised of 19 weeks. All units incorporate research methods training, and supervisors will guide students throughout the year, following their progress and encouraging you along the way. Assessment is structured around the research/coursework ratio, and all units include a research report that is the dominant component of assessment.