international experience

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The faculty in the Department of Energy, Environmental & Chemical Engineering (EECE) at Washington University in St. Louis believe that the education of a 21st century engineering student requires a global perspective and practical skills. In 2007, the department launched a program designed to enhance and enrich opportunities for undergraduate students to study issues related to energy and the environment in a global context and to develop teamwork and leadership skills. During the summer, students selected through a competitive process visit a partner in the McDonnell International Scholars Academy, a network of the world’s premier universities. The international experience allows students to gain first-hand knowledge of energy and environmental issues in the host country and provides them an opportunity to interact with the world’s leading scholars who are conducting research projects through the McDonnell Academy’s Energy and Environment Partnership (MAGEEP). Following the visit, students use their critical thinking skills and new knowledge to better understand the problems they discovered and develop solutions by writing a research paper and participating in a three-credit-hour course taught by an EECE faculty member.

This brochure highlights the success of the program and plans for the future. I hope you will join us in our effort to enhance the International Experience Program and expand our global reach. With your support, we can offer this exceptional opportunity so that students can see how their engineering skills and education can make a difference around the world.

Sincerely,

Pratim Biswas, PhD
Lucy & Stanley Lopata Professor
Chair, Department of Energy, Environmental & Chemical Engineering

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Message from the Chair

Engineering is so much more than just solving problems and performing calculations; it requires an understanding of different cultures and world views in order to address the world’s most pressing energy and environmental concerns. Washington University acknowledges this fact by incorporating an international experience into its undergraduate research program, and I’m so thankful that I was able to participate in this once-in-a-lifetime opportunity.

— Brittany Radke

Watch student videos: www.youtube.com/WUSTLEngineering, search “International Experience”
International Experience Locations

2008 — Beijing, China

During the inaugural international experience in Beijing, students studied air quality management and the special challenges for air pollution control before the 2008 Summer Olympics. Participants attended lectures by the Chinese representative to the Kyoto Protocol and directors for key laboratories for air pollution control and attended classes at Tsinghua and Peking universities.

LECTURE TOPICS
- Acid rain, ozone and climate change
- Aerosol pollution in China
- Air quality forecasting for the Olympics
- Electric power generation in China
- Environmental management in China
- Environmental policy & investment
- Health impacts of air pollution
- Mobile sources & air pollution

2009 — Seoul, Korea

The international experience in South Korea focused on the development of nanotechnology and aerosol sciences. Students visited four universities and two national laboratories. While visiting Yonsei University, students gave seminar presentations on water splitting, solid oxide fuel cells, nanomedicine, biomimicry, wastewater treatment and nanotoxicity.

LECTURE TOPICS
- Nanoparticle & aerosol energy
- Nanoparticle & geothermal energy
- Nanoprobes in bioimaging & technology
- Reaction Engineering
- Traffic & air pollution

2010 — Mumbai, India

Students received broad exposure to energy and environmental issues in India by visiting faculty at the Indian Institute of Technology, Bombay (IIT Bombay). They also visited multinational corporations, Tata Institute of Social Sciences and a rural village to observe use of biomass as energy sources. Students also traveled to Mumbai, Mahabaleshwar, Bangalore, Agra and Delhi to visit landmark sites.

LECTURE TOPICS
- Air quality in India
- Bioenergy
- Colloids & aerosols
- Control systems
- Electrospray & applications
- Global challenges in aerosol sciences
- Reaction engineering
- Traffic & air pollution

2011 — Hong Kong, China

Students learned about the alternative energy usage such as biofuel, solar, and wind energy in a densely populated urban environment. They were also exposed to the green business practices in Hong Kong, sustainable energy policy, performance-based building energy code, and built solar cells. They also visited the Chinese Academy of Science in Shenzhen, China; China Light and Power Co. Hong Kong; Shanghai Banking Corp.; Civic Exchange and DuPont Apollo.

LECTURE TOPICS
- Second generation CIGS solar cells
- Hong Kong as an international financial center
- Air pollution and health in Hong Kong
- Wind Energy in Hong Kong
- Environmental biotechnology
- Biofuel utilization in Hong Kong
- Electrochemical materials for clean energy
- Nanomaterials for energy applications
International Experience Locations

2012 — Campinas, Brazil

The students had a thorough exposure to Brazil’s development and dominance in biofuel production and distribution in and out of the classroom. The students were lectured by the professors from State University of Campinas and WUSTL. They also visited Petrobras, Braskem, USINA ESTER (sugar cane mill), Rodia, Buckman, Brazilian Bioethanol Science and Technology Laboratory and the Brazilian National Laboratory of Synchrotron Light.

LECTURE TOPICS

» Sugar cane ethanol R&D
» Biomass to chemicals in Brazil
» Alcohol biofuel process
» Lithium ion battery reliability
» Nanomaterial in biotechnology
» Enzyme kinetics
» Sugar cane biomass pyrolysis
» Toxic effects of pesticides

2013 — Brisbane, Australia

HIGHLIGHTS

» Students will visit University of Queensland and Sydney for two weeks
» Projects on chemical technology, alternative energy, aquatic engineering and wastewater treatment
» Interact with students from University of Queensland
» Socio-cultural programs & internship opportunities

LECTURE TOPICS

» University of Queensland Energy Initiative
» Renewable Electricity Generation by solar and geothermal sources
» Biofuels
» Australian coal industry
» Australian gas industry
» Direct carbon fuel cells
» XCarbon capture and sequestration

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 ü  International Experience annual report
 ü  Invitation to Scholarship Dinner

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For information about the International Experience program contact:
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