Enhancing International Research and Cross Border Collaboration in Innovative and Unexpected Ways

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2018 AIEA Annual Conference
The Internationalization Imperative in Turbulent Times

USF WORLD UNIVERSITY OF SOUTH FLORIDA
MICHIGAN STATE UNIVERSITY
RUTGERS THE STATE UNIVERSITY OF NEW JERSEY
Session Take-Aways:

Proven strategies for designing and implementing programs, support structures, and resources that effectively incentivize and sustain international research engagement.

Participants will have the opportunity to discuss ideas, innovations, and lessons learned regarding building capacity around globalized research endeavors.
How do we, as SIOs, incentivize and support international research among key stakeholders?

- Undergraduate Students
- Graduate Students and Post-Docs
- Faculty
- Staff (research administrators, unit administrators, support staff)
- Partners (Industry, other IHEs, NGOs, and other external groups)
Integrating High Impact Practices into the General Education Curriculum and 4 and 8 Semester Program Course Sequencing

- Study Abroad
- Undergraduate Research
- Community Engagement
- Internship Experience
Synching Peace Corps Programming and Global Student Research

USF Graduate students travel internationally with undergraduate students to conduct research and learn from international development practitioners in the field: Panama, Costa Rica, and Ecuador
Bringing High Caliber Scholars to USF

University of South Florida

The Fulbright Postdoctoral Award at the University of South Florida, in honour of President Judy Genshaft, enables qualified UK postdoctoral researchers to pursue research at the university for up to two years.
Leveraging Global Partnerships for Collaborative Faculty Research

- Joint Funding
- Match-Making (Researchers and Disciplines)
- Mentoring and Professional Development
- Institutional Recognition and Resources

University of Ghana + University of South Florida
Building a New Generation of Academics in Africa (BaNGA-Africa)
Managing the Start-Up Process

Nothing is more frustrating than receiving funding and later discovering that something in your project was not taken into account that now threatens its sustainability. Find resources here to assist in preventing roadblocks and navigating them successfully when they do occur.

Communication, Culture, and Ethics

Communication, culture, and ethics should all take center stage when working on an international collaboration. Not only do you need to be able to communicate effectively with your project researcher, but you should also be able to communicate with other administrators on the project as well as carry realistic expectations on project progress.

Human Resources, Payroll, and Taxes (Labor and Tax Laws)

Many global research activities involve faculty, students, and/or staff working for various periods of time in the country of project operation. Some initiatives may involve transferring an employee abroad or relocating an employee for an extended period of time outside his or her home country. Still, others may also necessitate hiring foreign nationals to work in their home countries in support of the project and/or hiring foreign nationals to work in the U.S. These issues can all present a range of legal, financial, risk management, and logistical considerations that can create complications and add expenses. Explore some of these issues and charts to help navigate the complexity in this section.

Intellectual Property and Commercialization

Intellectual property and commercialization are two issues that are especially salient at the international level—especially when industry partners are involved. They are a central issue in international research collaborations and should be addressed by a legal professional at the earliest chance in a burgeoning project.
Connecting the Dots Across Campus Stakeholders
GLOBAL GRAND CHALLENGES

- Global Health
- Conflict and Governance
- Environment & Energy
- Access to Education
- Food Security
- Poverty
- Financial Inclusion
- Social Justice
- Population Growth
# College of Engineering

## Education Abroad Programs

The College of Engineering Education Abroad Programs Grid provides an overview of the education programs sponsored by the College of Engineering. There is information on each program related to the semester the program is offered, the "ideal" class standing when a student might participate on the program, and the best suited major for each program. One will find the list of programs down the left-hand side of the grid, and one will find the semester, class standing, and major across the top of the grid.

### Programs

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* • indicates that this program is possible for the semester, class standing, and major identified across the top of the grid.
* • • • indicates that there are many possibilities for the semester, class standing, and major identified across the top of the grid.
* * • • indicates that this program is not possible for the semester, class standing, and major identified across the top of the grid.

* Check with the College of Engineering Study Abroad Coordinator to determine if this program is running during the current academic year.
• MSU’s STEM Partners identified global pathways for students.

• Students can now find an experiential learning opportunity that fits in their degree program and fulfills needed experience and credits.

• MAPS
EDUCATION ABROAD
for Mechanical Engineering Majors

ME EDUCATION ABROAD PROGRAMS

STEPS FOR CHOOSING AN EDUCATION ABROAD PROGRAM

1. Visit the Education Abroad Advising Center (International Center Room 108) and attend Education Abroad 101.

2. Talk with your academic adviser to discuss your interest in studying abroad and how it can fit into your degree plan.

3. Meet with the College of Engineering Education Abroad Coordinator to talk about program details and application process.

4. Fill out a Course Approval Form (CAF) to determine how courses taken abroad will count toward your degree.

5. Complete an online application with the MSU Office for Education Abroad and apply for scholarships and other sources of funding.

University of New South Wales
Sydney, Australia
Terms: Fall and Spring
Required GPA: 3.00
Courses Offered In: ME, MTH, STT, PHY, MSE, BS, ISS 3XX, IAH 211+

Hong Kong University of Science and Technology
Hong Kong, China
Terms: Fall, Spring, and Summer
Required GPA: 3.00
Courses Offered In: ME, MTH, STT, PHY, MSE, CE, ISS 3XX, IAH 211+

École Catholique d’Arts et Métiers (ECAM)
Lyon, France
Terms: Summer (Early June - Mid July)
Required GPA: 3.00
Courses available: ME 201; FRN GCU

CEA STEM in Paris
Paris, France
Terms: Summer (Late May - Early July)
Required GPA: 2.5
Courses Offered: CE 221; MTH 234; ISS 3XX

RWTH Aachen University
Aachen, Germany
Terms: Summer (Mid May - Late July)
Required GPA: 3.00
Courses Offered: ME 490, GRM 102 or higher

Leibniz University
Hanover, Germany
Terms: Summer (Mid May - Early August)
Required GPA: 3.00
Class Standing: Junior minimum
Courses Offered: ECE 490

University College Dublin: Summer Physics
Dublin, Ireland
Terms: Summer (Late June - Early August)
Required GPA: 3.00
Courses Offered: PHY 183, 184, 191, 192

John Cabot University
Rome, Italy
Terms: Summer 1 (Mid May - Late June)
Summer 2 (Late June - Early August)
Required GPA: 2.75
Courses Offered In: ME, MTH, ITL, IAH 211+, ISS 3XX

University of Edinburgh
Edinburgh, Scotland
Terms: Fall and Spring
Required GPA: 3.00
Courses Offered In: ME, ISS 3XX, IAH 211+

Pontatech: 5 Trending Technologies in Madrid
Madrid, Spain
Terms: Summer (July - August)
Required GPA: 2.00
Courses Offered: ME 222; EGR 291; SPN 290 (no pre-req)

Note: The online version of this document has links (in green font) to program applications and course equivalencies.
Summer Options

John Cabot University
Roma, Italy
Courses:
Summer 1 (Mid May - Late June): ME 201; MTH 132; IS 320 or IA 209/221a
Summer 2 (Late June - Early August): ME 201; MTH 135; IA 211a

CEA Paris: STEM in Paris
Paris, France
Late May - Early July
Courses: MTH 234; CE 221

École Catholique d’Arts et Métiers
Lyon, France
Early June - Mid July
Courses: ME 201; FRN 401

University College Dublin: Summer Physics
Dublin, Ireland
Late June - Early August
Courses: PHY 185, 191; PHY 184, 192

10 Trending Technologies in Engineering Madrid, Spain
Early July - Early August
Courses: EGR 291; SPN 290 (no pre-req)

Hong Kong University of Science and Technology (HKUST)
Hong Kong, China
Mid June - Mid August
Courses: MTH 235; IAH 211b or IS 330B

Fall or Spring Options

University of New South Wales
Sydney, Australia
Courses:
Fall: MTH 122, 133, 235; PHY 183, 184; STT 315, 351; MSE 250; CSE 231; CHE 201; EC 201, 202; ISS: SXX; IAH 211a
Spring: MTH 132; 234; PHY 183, 184; STT 315; CSE 231; ME 201; ME 222; BS 161; EC 201, 202; ISS: SXX; IAH 211a

Hong Kong University of Science and Technology (HKUST)
Hong Kong, China
Courses:
Fall: MTH 133, 234, 235; PHY 183; CSE 231, 232; ME 201, CE 221; MSE 250; EC 201, 202; STT 315; IAH 211a; ISS: SXX; IAH 161
Spring: MTH 133, 234; PHY 184; STT 315; CSE 231, 232; CE 221; ME 222; EC 201, 202; IAH 211a; ISS: SXX

University of KwaZulu-Natal
Durban, South Africa
Courses:
Fall: MTH 133, 234; PHY 184; CE 221; MSE 250; EC 202; IAH 211a; ISS: SXX
Spring: MTH 132, 234; STT 351; PHY 183; CHE 201; ME 201; ME 222; CSE 231; EC 201; IAH 211a; ISS: SXX

Monash University
Melbourne, Australia
Courses:
Fall: MTH 132; 234, 235; PHY 184; ME 201; CSE 231; EC 201, 202; CHE 201; STT 351; IAH 211a; ISS: SXX
Spring: MTH 132, 234; PHY 183; ME 201; ME 222; MSE 250; CSE 231; EC 201; 202; STT 351; IAH 211a; ISS: SXX

Education Abroad 101

EAOI sessions provide an overview about education abroad at Michigan State. Topics covered include wiring the online program search, navigating the application process, finding funding opportunities and more.

ONLINE: Coming Soon
GROUP PRESENTATION: Every Friday at 10:00pm in the EA Advising Center (International Center Room 108)
INDIVIDUAL SESSION: By appointment, other advising sessions to schedule

Do I need a foreign language?
No, knowing a foreign language is not a requirement on all programs.
To determine if a program has a language requirement, check in the description found in the MSU eA online program search.

Can international students study abroad?
Yes, international students and resident aliens are welcome to participate in education abroad programs at MSU. Students must apply for and obtain a visa for their intended program as soon as possible.
For more information visit: educationabroad.isp.msu.edu

How is health and safety addressed?
The Office for Education Abroad works with the Office of International Health and Safety (OIHs) to oversee health, safety, security of students while they are participating on education abroad programs.
OIHs supports MSU students by:

- Offering a 24/7 International Emergency Assistance Line +1 (517) 353-3784
- Monitoring international events and global public health concerns
- Collaborating with the Office for Education Abroad to offer comprehensive pre-departure orientation to program participants
- Coordinating international health and political unrest/natural disaster evacuation insurance
- Providing specialized training to Education Abroad Program Directors and Assistants.

For more information on health and safety visit: oih.sisp.msu.edu

*SpartansAbroad*
Develop strong research collaborations with key partners, share students between institutions in labs of collaborating faculty.
Additional Information and Tools for International Projects

- Budget Preparations
- Subaward Setup Guidance
- Methods of Payment and Imrest Advance Procedures
- Subject Matter Experts
- GRAND Forum Presentations

Resources
- Forms & Templates
- Tools
- Frequently Required Budget and Proposal Data
- Policies
- Reports and Statistics
- SPA Metrics
- Training +
- SPA Newsletters
- Resources, Initiatives, and Related Units
- Sponsor Information
The Next Evolution is Networks of Problem Solvers

- Nimble
- Responsive
- Integrative
- Collaborative
- Change Actors
- Risk Preferred
- Open
The Academy for Global Engagement aims to:

- Build growing cohort of faculty who form global research relationships, problem-solve with partners, view scholarship through global lens
- Heighten global awareness and dialogue
- Elevate status of MSU’s global mission
- Tap into campus resources in international programming
- Capitalize on opportunities to leverage external resources, partnerships
- Be a force in developing global research project priorities, influence high-level strategies to address them
AGE empowers faculty to develop networks aimed at tackling grand challenges through:

- Identifying and working with global research partners
- Effectively communicating research to diverse audiences
- Developing partnerships with program officers at agencies/funders
ACADEMY FOR GLOBAL ENGAGEMENT
Mechanisms for reaching impact

Working with mentors, our AGE Fellows help expand on the University’s expansive global footprint
The Global Academy’s goal is to create a new generation of international research experts at MSU who will use their scholarship to contribute solutions to the grand challenges of the 21st century.
Launched in 2014, the Academy for Global Engagement (AGE) empowers early- and mid-career MSU faculty to become the next generation of global researchers.

Metrics Being Tracked (FY 2015-2017)

- $8.5M International funding
- 29% Internationally co-authored outputs
- 47% PI credit amount obligated
  * $0.6M Total PI college & department credited F&A
  * $20.6 M Total Awarded Amount

Research funding received and scholarly output of three cohorts after the fellowship, 2015-2017*.

Partial results of survey in 2017 indicated that more than 80% (15/18) of AGE fellows reported improvements in their communication and networking skills because of AGE fellowship.

* A study is ongoing to compare outputs of AGE faculty (participant) against a carefully assembled peer group of non-participant MSU researchers (control).
Strengthen collaborative advantages by developing unique networks and innovative partnerships to leverage intellectual capabilities.

**BEST PRACTICE**

Academy for Global Engagement Fellows Program - faculty development mentoring to build international research capacity.
The key is to position yourself with organizing expertise around the nexus of the Grand Challenge (large-scale) awards.

Employ principles of branding, marketplace intelligence, experience and innovation.
RESEARCH

Over $600 million in 2017

International Programs that include education + research: $60 mil
Partnerships for Sustainable Community Development+++
The Tanzania Partnership Program+++

Mission: To find long-term solutions, build capacity and create collaborations that promote resilient and sustainable communities. To unite development, education and research that boldly pushes the frontiers of knowledge and the role universities play in transforming local communities and the lives of individuals.

Partners: +
- Michigan State University (multiple colleges)
- Institute of Resource Assessment (IRA), University of Dar es Salaam
- Dar es Salaam University College of Education (DUCE)
- Aga Khan Foundation (AKF) and Aga Khan University (AKU)
- Sokoine University of Agriculture (SUA)
- District Governments
- Milota Village, Lindi District, Tanzania
- Naitolia Village, Monduli District, Tanzania

Approach:
- Addressing complex problems through an integrated and interdisciplinary approach
- Create an iterative relationship between development, research and education
Eric Garfunkel

Global Engagement in STEM Research
Why engage globally in STEM research?

- Impact of research on global development—SDGs (impact on people, societies…)
- Science diplomacy (sciencediplomacy.org)
- Mission/vision/values, philanthropy, personal
- Increase number and diversity of minds involved in a given project
- Recruiting - future source of staffing or students (in country, or globally)
- PR for your institution
- Industry needs – new markets
STEM research topics of relevance to the developing world (most of the SDGs):

- Energy (carbon, alternative)
- Sustainability/environment
- ICT (computer science, big data, telecom)
- Infrastructure – transportation, construction
- Mining/processing
- Water
- Health
- Agriculture
- Nanotech
- Social science partnerships are essential
The partner (person, division, institution): chosen with thoughts of strength, sustainability, history, promise

- University (U Sao Paulo, Wits, UHavana, UGhana)
- Institute or National Laboratory (BITRI, CAS, LIPI)
- NGOs (Coral reef organizations, Engineers w/out Borders)
- UN, UNESCO and related internation organization (IAEA)
- Researcher and/or Senior Administrator
- Industry
- Government
- Societies

Rutgers University
International professional societies as partners: Help create and/or grow one!

Societies (such as AIEA) are critical for initiating and maturing partnerships. They often are underfunded or non-existent in the developing world

- Use society conferences and short courses to initiate partnerships – excellent for networking
- Organize conferences and short courses with global partners
- Grow student exchanges facilitated by society (JUAMI)
- Our programs have been funded by NSF (regular, IGERT, PEER, PIRE, etc.), Carnegie, World Bank, USAID, NIH, etc.
- Use US-based networks (Big Ten, AIEA, APLU, etc.)
Facilitate academic mobility (of students, faculty and administrators) with a focus on research

- Students (undergraduate and graduate)
  - Conference or Summer School
  - Study/Research Abroad
- Post-doc, Visiting Scholar
- Senior Scientists
- Virtual mobility for education and research
Support opportunities – public, private, international, foundation, non-profit

- US: NSF, DOD, NIH, USAID, MRS, ACS, APS, NAS, AAAS
- CRDF Global
- Africa: AfDB, EADB, AU, South Africa, Nigeria, TWAS
- International
  - EU/EC, CNRD, DAAD, Scandanavian
  - Asian - CSC, Japan, LPDP/Indo, Taiwan
  - Latin American – Pronabec, Brazilian, Mexican…
- World Bank
- UN: UNESCO, UNDP, UNHCR…
- Foundations: Carnegie, Ford, Gates, Rockefeller, Mellon…
- Private Companies: IBM, Cisco, Siemens, l’Oreal, Sasol, Coca-Cola, BASF, Intel…
Potential Challenges

- Legal/regulatory/compliance (IRB)
- Intellectual Property (IP)
- Cultural
- Political
- Linguistic/communications
- Freedom of speech
- Security/Health
- Publication limitations/authorship
Science ⇒ Engineering ⇒ Business development, beneficiation, products

- Manufacturing
- Innovation
- Intellectual Property
- Translational Research
- Commercialization
- Startups and Spin-offs
Take home messages (to help develop sustainable STEM partnerships)

• Focus on several university strengths – create teams focused on grand challenges (SDGs or other)
• Find and attract appropriate faculty and bring them together (preferably already engaged)
• Grow existing partnerships (or develop new ones)
• Attract knowledgeable administrative staff
• Funding – multiple sources, seed funds as needed
• Develop software and assessment systems
• Encourage student and faculty mobility
• Remain creative, flexible and agile