

**Fund for the Improvement of Postsecondary Education (FIPSE)**

**U.S.-Brazil Higher Education Consortia Program**  
*Project Abstracts - FY 2003 Awards*

**P116M030002**

**University of Georgia (GA)**

**Title: “Changing Perspectives: Technology Integration and the Multicultural Classroom”**

**Partners:** University of Georgia, Department of Instructional Technology, GA; University of Missouri, Columbia, MO; School of Information Science & Learning Technologies, MO; Universidade Federal do Ceará, Department of Computer Science, CE; Universidade Estadual Paulista, Department of Computer Science, SP.

**Subject Areas:** Education, Instructional Technology

The face of education has changed worldwide. Two of the most vital forces are those of emerging educational technologies and the presence of multiple cultures, nationalities, races, and ethnicities in the classroom. As technology breaks the boundaries of the classroom, reaching out to different states and countries, the school will become increasingly heterogeneous. The teachers of tomorrow must embrace technology and diversity as forces that have the power to shift the paradigm of education. Technology and diversity are cyclical currents. As technology increases outreach through distance education and collaboration, the school will encompass a more varied population of students. An increasingly diverse student base then requires the sensible use of technologies. The consortium will develop a certificate for pre-service teachers designed around a new curriculum to meet the needs of an emerging global learning community. This certificate will better train tomorrow’s teachers to embrace technology in the K-12 classroom as a problem solving method while leveraging cross cultural networks and global awareness. Teaching future teachers adds a lasting, exponential value to the educational intercultural exchange. Participants will return to their home schools as ‘agents of change,’ helping others to gain a multicultural perspective in education and the effective application of technology in rural and urban classrooms in both developed and developing countries. Evaluation will be embedded in the project, beginning with course proposals, and student recruiting and marketing tools. It will continue with course materials, lesson plans, student exchange, and course feedback. Evaluation will conclude with assessment of returning exchange students through interviews and focus groups. A final report will include suggestions on the strengths and weaknesses of the project, and ways to extend it beyond the grant period. The curricular and exchange framework for this project, once in place, will be a permanent part of the study abroad program for all four participating institutions.

FY 2003 Award: \$22,217

Total Funding Estimate: 4 Years, \$203,981

**Project Director:** Dr. Michael Orey, Department of Instructional Technology, The University of Georgia, 604, Aderhold Hall, Athens, GA 30606, Tel: (706) 542-4028, Fax (706) 542-4032, e-mail: [morey@coe.uga.edu](mailto:morey@coe.uga.edu)

**P116M030005**

**Southern Methodist University (TX)**

**Title: “U.S.-Brazil Higher Education Consortium on Cross-cultural Engineering: Manufacturing for Global Security”**

**Partners:** Southern Methodist University, TX; Texas A&M University, TX; Centro Federal de Educacao Tecnologica, PR; Universidade Metodista de Piracicaba, SP

With the expanding globalization of the socio-economic process, the manufacturing activity, in particular, now requires a more diverse professional capable of implementing quickly and creatively new technologies and new approaches to production. In response to this new challenge, the Consortium on Cross-cultural Engineering: Manufacturing for Global Security is to seed a new framework for international engineering education and co-operation. The synergistic theme Manufacturing for Global Security draws on existing complementary areas of excellence in each of the four partnering universities, bringing engineering, sociology, anthropology, economics, political science, ethics and international law into a multi-disciplinary and a multi-cultural initiative. A group of 88 participants (including junior and senior engineering students) will be directly involved in the consortium. Students will be trained through a special new curriculum, developed by the consortium, to become globalists (ambassadors), to work in multicultural teams, to identify the interactions and the entanglements of different cultures, and to gain appreciation for social, economical, and political differences and their consequences to global manufacturing. They will have also opportunities for industrial internships and to further their international experience at a post-graduate level after graduation.

The consortium will strengthen U.S.-Brazil relations, develop strategies for facilitating student and faculty international mobility, create pioneering common core curriculum for international engineering education, increased marketability of students and faculty by enhancing their knowledge of Brazilian/American languages and cultures, produce and evaluate strategies for international engineering education, increase academic awareness of manufacturing for global security, and finally disseminate the results to other higher-education institutions.

FY 2003 Award: \$24,971

Total Funding Estimate: 4 Years, \$204,000

**Project Director:** José L. Lage, Mechanical Engineering Department, Southern Methodist University (SMU), Box 750337, Dallas, TX 75275-0337, Tel: (214) 768-2361, Fax: (214) 768-1473, E-mail: [JLL@ENGR.SMU.EDU](mailto:JLL@ENGR.SMU.EDU)

**P116M030006**

**Ball State University (IN)**

**Title: “U.S.-Brazil Sustainability Consortium”**

**Partners:** Ball State University, IN; University of Texas at Austin, TX; Center for Maximum Potential Building Systems, TX; Federal Center of Technological Education, PR; Pontificia Universidade Catolica do Rio Grande do Sul, RS; Technology Institute of Parana, PR.

A major challenge exists to produce (cities, communities, buildings, food, products) in ways that are sustainable (environmentally responsible, socially equitable, and economically viable). As societies embrace sustainability, those in developed regions focus most on environmental responsibility, while those in developing regions focus more on social and economic aspects. Sustainability requires that all three be addressed; and addressing all three becomes more challenging as physical planners and designers increasingly produce solutions for environments, people, and economies (within their country and globally) that are profoundly different than those in which they live. This program increases student abilities to make sustainable decisions in diverse contexts within their own country and in other countries. Through a hierarchically structured curriculum and project-based learning the U.S.-Brazil Sustainability Consortium builds upon the education that students receive in their professional degree programs. It provides classroom content and community-based sustainability application experiences in the host country very different from their previous experiences. These include international experiences that prepare students for later work in diverse (physical, cultural, economic) environments in their own country, host country, or other countries. Students participating in the project will include advanced undergraduate planning, design, and engineering students (most in their last two years of study) and graduate students (most in their final year of study). Goals of the program include 1) improving the ability of academic programs to educate students to lead their professions and broader communities to sustainable and regenerative planning, design, and engineering solutions, 2) overcoming barriers to student accessibility, and 3) leveraging FIPSE-CAPES funding with project funding (by others) to recruit students, prepare them academically and with language skills, provide supervision, facilitate student and teacher exchanges, and extend existing inter-institutional relationships and exchange programs. This project includes assessment of student mobility, language learning, cultural engagement and the three levels of the program's sustainability curriculum.

FY 2003 Award: \$29,959

Total Funding Estimate: 4 Years, \$203,948

**Project Director:** John L. Motloch, Professor and Director, BSU Land Design Institute  
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**P116M030007**

**University of California, Davis (CA)**

**Title: “Brazil–U.S. Consortium in Sustainable Ruminant Livestock Production Systems: An Integrated Approach to Education, Research and Communication in Nutrition and Management of Ruminant Livestock”**

**Partners:** University of California, Davis, CA; Cornell University, NY; Universidade Federal Rural de Pernambuco; Universidade de São Paulo, Pirassununga

**Subject areas:** Ruminant Livestock, Sustainability, Agroecology, Natural Resources

Ruminant livestock play a major role in sustaining natural resources and rural economic viability in developed and developing regions of the world. Limitations imposed by climate, soils, pests and diseases affect the types and productivity of agroecosystems, which are partially governed by basic principles of animal nutrition, land use and ecological sustainability, and economic opportunity. In order to address issues of productivity and sustainability in all of the Americas, there is a need to bridge the language, cultural, technical and economic gaps that exist between our countries. The Brazil-U.S. Consortium in Sustainable Ruminant Livestock Production Systems will develop a new student-centered cross-national curriculum focusing on agricultural and ecological aspects of natural resource management in livestock production. Based on the Consortium institutions’ histories of international leadership as well as renowned expertise in ecology and animal agriculture, this integrated curriculum will allow students and faculty to compare and contrast agroecological systems and livestock management issues in both the United States and Brazil. The geographic diversity offered by this consortium provides a unique context in which to study the scientific basis of sustainable ruminant livestock production systems, acquire foreign language proficiency, and learn about the social, cultural, and political dimensions of natural resource management. This proposal includes a framework for student exchange, internships, and the expansion of an existing Education Abroad Program.

FY 2003 Award: \$29,970

Total Funding Estimate: 4 Years, \$203,979

**Project Director:** Roberto D. Sainz, Department of Animal Science, University of California, 1 Shields Avenue, Davis, CA 95616, Tel: (530) 752-0526, Fax: (530) 752-0175, e-mail:

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**P116M030008**

**The Ohio State University (OH)**

**Title: “Training Industrial Engineers to Manage High-Risk, Complex Systems: Applying Cognitive Engineering to Human Factors and Automation in the Oil Industry”**

**Partners:** The Ohio State University, OH; University of Virginia, VA; Universidade Federal do Rio de Janeiro, RJ; Universidade Federal do Rio Grande do Norte, RN; Petrobras-Petroleo Brasileiro S/A, RJ

**Subject Areas:** Industrial Engineering, Human Factors, Ergonomics, Petroleum Engineering, Chemical Engineering, and Cognitive Engineering

Cognitive Engineering combines interdisciplinary perspectives from industrial engineering, industrial design, computer science, and psychology to advance our understanding of how to design highly technological work environments while maintaining the safety and capacity for human workers to manage the complexities of these environments. From the control room to the operating room, cognitive engineering provides the integrative perspective linking technology and cognitive science with people embedded in fields of practice. This project focuses on a supervised exchange of 40 industrial engineering undergraduates (seniors) over a three year period between two Brazilian and two American universities to undertake a combined set of coursework as well as work in teams to solve real problems identified by the industrial partner, Petrobras-Petroleo Brasileiro. This program seeks to enable the students to develop competences in cognitive engineering, to design for the high-risk and complex system of oil and gas pipeline management, to develop new language skills, to comprehend the role of social, cultural, and technological differences in engineering practice, and the capacity to learn in differentiated contexts. After this international experience, these young engineers will be equipped to work in multinational work teams applying a human-centered approach to systems design within the global economy. The university faculty will develop strong relationships for future international research projects.

FY 2003 Award: \$29,995

Total Funding Estimate: 4 Years, \$198,980

**Project Director:** David D. Woods, Department of Industrial and Systems Engineering, The Ohio State University, 210 Baker Systems Building, 1971 Neil Ave, Columbus, OH 43210, Tel: (614) 292-1700, Fax: (614) 292-7952, e-mail: [woods.2@osu.edu](mailto:woods.2@osu.edu)

**P116M030009**

**University of Missouri-Columbia (MO)**

**Title: “Consortium for Cooperation in Civil & Environmental Engineering Technologies”**

**Partners:** University of Missouri, Columbia, MO; University of Colorado at Boulder, CO; Universidade Federal de Pernambuco, UFPE; Pontificia Universidade Catolica do Rio de Janeiro, RJ

**Subject Areas:** Civil Engineering, Environmental Engineering

The complexity of environmental problems at the local, national and global levels indicate the need for a workforce that is knowledgeable about them and has the necessary experience to practice in countries other than their own. The Consortium for Cooperation in Civil & Environmental Engineering (CEE) Technologies program involves the following academic and research topics: Environmental, Geotechnical and Transportation Engineering, Water Resources and Hydrology as well as what is commonly referred in Brazil as Sanitary Engineering. The Consortium provides an avenue for faculty from internationally recognized academic institutions to meet the challenge to train students for the 21<sup>st</sup> century by providing them with an enhanced coursework in Civil & Environmental Engineering that will include inter-institutional projects and curricula addressing issues with national, international and global implications. Additionally, the Consortium will provide students with the tools needed for foreign language proficiency and a cultural background that will benefit their personal and professional lives. The project defines a vision for study abroad that has these objectives: (1) to establish a coordinated student and faculty international exchange program between partner universities; (2) to cooperate in the development of teaching methods and teaching standards in consortium universities; and (3) to create an opportunity for undergraduate and graduate American Civil & Environmental Engineering students to experience a study abroad program in Brazil, become proficient in Portuguese language and get acquainted with the Brazilian culture offering, at the same time, a similar opportunity for Brazilian students in the United States. The development and implementation of this consortium in Environmental Engineering education presents evaluation challenges that will be addressed by a blend of internal and external evaluation activities that will guide the permanent implementation of the program in partner institutions.

FY 2003 Award: \$29,939

Total Funding Estimate: 4 Years, \$204,000

**Project Director:** Aderbal C. Corrêa, Program Director, Center for Environmental Technology, Department of Civil and Environmental Engineering, University of Missouri-Columbia, E2509 EBE, Columbia, MO 65211-2200, Tel: (573) 882-2041, Fax: (573) 882-4784, e-mail [CorreaA@missouri.edu](mailto:CorreaA@missouri.edu)

**P116MO30013**

**University of Nebraska-Lincoln (NE)**

**Title: “Inter-university Program in Human Resources Training in Computational Mechanics”**

**Partners:** University of Nebraska-Lincoln, College of Engineering & Technology, NE; Kansas State University, College of Engineering, KS; Universidade Federal Do Ceará, CE; Universidade Federal Pernambuco, PE

**Subject Areas:** Civil Engineering, Mechanical Engineering, Computer Engineering

Industry partners express the need for employees who are prepared to work in a global world. The goal of the Inter-university Program in Human Resources Training in Computational Mechanics is to establish an academic and cultural experience exchange program. The project focuses on training in computational mechanics, involving both analytical and computer graphics aspects. The objective is to enhance education at the undergraduate level by means of student exchanges and faculty cooperation. The program is designed so that the undergraduate programs which have aspects of computational mechanics in their curricula can participate. There is a natural interface among such programs given that computational engineering is by nature interdisciplinary and applied to a broad spectrum of problems in engineering which require knowledge in mechanics, materials and computer software. An additional value is the development of improved communication skills, the international experience enhances the engineering students ability to communicate to a variety of audiences. The program will allow students the opportunity to study abroad. A prerequisite for student participation is to be at least in the 3rd year of an engineering undergraduate program. Students will have the option to take courses in various engineering disciplines while participating in student-centered activities such as mentoring partnerships, student organizations, advising sessions, industry field trips, and student study sessions. Each institution will require a language and cultural component during the study abroad time. An engineering or technology internship will be provided for each student participant. The program will recognize the transfer of credits among the U.S. and Brazilian institutions involved. Faculty and administrators will identify a shared, common, or core curricula among the institutions that will serve engineering and technology students. The consortium will engage an external evaluator that will evaluate the project at the consortium level, rather than just the lead institution. An evaluation will be made annually.

FY 2003 Award: \$29,916

Total Funding Estimate: 4 Years, \$203,904

**Project Director:** David H. Allen, Dean, College of Engineering & Technology, University of Nebraska-Lincoln, 114 Othmer Hall, P.O. Box, 880642, Lincoln, NE 68588-0642, Tel: (402) 472-3181, Fax: (402) 472-7792, E-mail: [dhallen@unl.edu](mailto:dhallen@unl.edu)

**P116M030014**

**Wake Forest University School of Medicine (NC)**

**Title: “U.S.-Brazil Infectious Disease Consortium”**

**Partners:** Wake Forest University School of Medicine, NC; University of Virginia School of Medicine, VA; Universidade Federal do Ceará, C, Santa Casa de Sao Paulo Medical School, SP, Research Institutes of Public Health, SP and Emilio Ribas, SP

**Subject Areas:** Infectious Diseases

The goal of the U.S.-Brazil Infectious Diseases Consortium (USBIDC) is to promote increased global understanding about infectious diseases through the exchange of faculty and medical students between six institutions in the United States and Brazil. Faculty exchange will occur in years 1-4 and will be done to improve the likelihood of sustaining the project after the funding period. Medical student exchange will occur in years 2-4 and will have two major components: 1) *clinical* infectious disease training: each medical student will be given a broad clinical exposure to better understand the diagnosis, treatment, and prevention of infectious diseases including: weekly didactic infectious disease conferences, weekly infectious disease rounds, infectious disease clinic, microbiology laboratory rounds, use of a self-study internet case-based infectious disease course, as well as visits to the health department to better understand the control and prevention of sexually transmitted diseases, tuberculosis, and vaccine-preventable infections. 2) infectious disease project: each medical student will be paired with a faculty mentor to perform an infectious disease-focused project that they will be required to write up and present both to the institution they are visiting and when they return home.

FY 2003 Award: \$27,188

Total Funding Estimate: 4 Years, \$203,920

**Project Director:** Robert J. Sherertz, MD, Chief, Section on Infectious Diseases, Department of Medicine, Wake Forest University School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157-1042, Tel: (336) 716-4584, Fax: (336) 716-3825, e-mail: [sherertz@wfubmc.edu](mailto:sherertz@wfubmc.edu)



**P116M030017**

**Temple University (PA)**

**Title: “Promoting the Inclusion of Persons with Disabilities in Society Through Assistive Technology: Culturally Appropriate Solutions”**

**Partners:** Temple University, PA; Bridgewater State College, MA; Universidade Federal da Bahia, BA; Universidade Tuiuti do Parana, PR

**Subject Areas:** Assistive Technology, School Related Professions

On a daily basis, people with disabilities face numerous barriers that prevent them from participating in and contributing more fully to activities in their home, school and work environments, and their communities. Technology has enormous potential to eliminate such barriers. When technology supports are present at an early stage, persons with disabilities are better able to develop functional skills that enhance their opportunities for inclusion in everyday community life. The proposed interdisciplinary program seeks to train advanced undergraduates, mostly juniors and seniors, majoring in school-related disciplines (e.g. speech communication, special education, physical education, recreational therapy, occupational therapy, and educational technology) in the development of culturally sensitive approaches to utilizing assistive technology. The participating institutions have recognized expertise in teaching, research and services related to the major content areas of the proposed program. Thus, they are able to generate unique collaborations at both the academic and administrative levels. Through a combination of academic activities and fieldwork, participants will learn to use and adapt high-tech and low-tech devices, in accordance to the varying functioning needs, socio-economic status, and cultural environments of persons with disabilities in the United States and in Brazil. As a result of this project, both countries will benefit from a cadre of professionals who are knowledgeable about a wide range of assistive technology and capable of generating interdisciplinary solutions to culturally specific problems in the education of persons with disabilities. Graduates of this program will be able to promote institutional changes and affect policy making, ultimately having an impact on the number of persons with disabilities who receive appropriate educational supports and move forward to full participation in their respective societies.

FY 2003 Award: \$26,499

Total Funding Estimate: 4 Years, \$203,182

**Co-Project Directors:** Dominique Monolescu and Rosangela Boyd, OnLine Learning Program/Institute on Disabilities, Temple University, 1301 Cecil B. Moore Ave., 665 Ritter Annex Bldg., Philadelphia, PA 19102, Tel: (215) 204-3154 or (215) 204-6749, Fax: (215) 204-2666, e-mail: [dominiq@temple.edu](mailto:dominiq@temple.edu) or [rboyd@temple.edu](mailto:rboyd@temple.edu)

**P116M030018**

**University of Kentucky (KY)**

**Title: “Biosystems and Agricultural Engineering Training – Educational Consortium for Sustainable Plant and Animal Production Systems”**

**Partners:** Iowa State University, IA; Universidade Federal de Viçosa, MG; Universidade Federal de Campina Grande, PB; Universidade Federal de Lavras, MG; Universidade de São Paulo – Piracicaba, SP.

**Subject Areas:** Biosystems Engineering, Livestock Engineering, Greenhouse Engineering, Environmental Engineering

Developing sustainable, safe and reliable food production systems to feed the growing world population requires that engineers be provided training in biological systems and agriculture, in addition to a broad-based engineering curriculum. Many such systems are criticized (rightly or wrongly) with regards to issues of sustainability, environmental degradation and animal welfare. The profession of Biosystems and Agricultural Engineering teaches the engineering skills necessary to design and manage such systems. The goal of the Consortium for Sustainable Plant and Animal Production Systems is to create training experiences for U.S. and Brazilian engineering students in the area of controlled environments and precision agriculture in their counterpart country, with similar needs but significantly different constraints on production efficiencies, and to attract additional students into this area of study. Students will experience a different cultural, social and academic environment and will receive credit towards their accredited engineering degree in their home institution. Specific objectives include: further strengthening existing collaborations between the participating faculty and institutions; promoting new collaborations to expand professional engineering opportunities for both U.S. and Brazilian students; and instilling undergraduate U.S. engineering students with an appreciation for similarities and differences in design problems of each country, and the need for flexibility in developing adequate solutions for various climatic and socio-economic situations, including areas of structures and environment, waste handling and treatment, food processing and safety, epidemiology and environment interactions, air and water pollution from agricultural enterprises and energy generation and storage using agronomic or bio-based fuels.

This Consortium brings together the expertise of seventeen faculty from six institutions, with internationally recognized academic credentials for teaching, research and outreach activities to address common problems of sustainability and profitability in plant and animal production systems design and management, with national and international implications. Students participating in this project will be advanced undergraduates. The pre-professional preparation that students receive through this Consortium should have great value and positive impact on their future professional activities, provide them with specialized experiential training, demonstrate the striking similarities in the engineering design of seemingly diverse production systems, and develop an appreciation for their ability to apply this knowledge to related sustainable agricultural development and in both developed and developing countries. Annual meetings between participants will include a means of assessment of successes and areas for improvement.

FY 2003 Award: \$29,987

Total Funding Estimate: 4 Years, \$204,000

**Project Director:** Richard S. Gates, Professor and Chair, Biosystems and Agricultural Engineering Department, University of Kentucky, 128 C.E. Barnhart Building, Lexington, KY 40546-0276, Tel: (859) 257-3000, ext. 127, Fax: (859) 257-5671, e-mail: [gates@bae.uky.edu](mailto:gates@bae.uky.edu)