

Deep South
Education & Research Center for
Occupational Safety & Health

Annual Report
July 1, 2005 – June 30, 2006

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The Deep South Center for Occupational Health & Safety



The University of Alabama at Birmingham & Auburn University



**Deep South Center Education and Research Center
for Occupational Safety and Health
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Introduction and Executive Summary

The mission of the Deep South Occupational Health and Safety Education and Research Center is to develop professionals who protect and promote the health and safety of workers through interdisciplinary education, research, and outreach programs, and our goal is to be a center of excellence that promotes occupational safety and health through interdisciplinary education and research to serve the needs of Alabama, the Florida panhandle, Georgia, Mississippi and Tennessee. The Center is a consortium of programs at two of the major universities in Alabama: the University of Alabama at Birmingham (UAB) in Birmingham, and Auburn University (AU) in Auburn. The Administrative Core is housed at the UAB School of Public Health. The core academic programs of the Center include Industrial Hygiene (IH) also at the UAB School of Public Health, Occupational Health Nursing (OHN) at the UAB School of Nursing, and Occupational Safety and Ergonomics (OSE) at the AU College of Engineering. The Center also incorporates two allied safety and health programs: Hazardous Substance Academic Training (HSAT) that is associated with the IH program, Occupational Injury Prevention Research Training (OIPRT) that is associated with the OSE program. The Continuing Education (CE) and Hazardous Substance Training (HST) are located in the UAB School of Public Health.

Center activities are coordinated through an Administrative Core consisting of the center director, Dr. Kent Oestenstad, the deputy director, Dr. Kathleen Brown, the assistant director, Dr. Elizabeth Maples, support staff, an Executive Committee, and Board of Advisors. The Executive Committee includes the Center Director, all of the academic program directors, and the CE program director. The committee meets at least quarterly to review progress in meeting program goals, student progress, plan short-term Center activities, and conduct long-term strategic planning. The Board of Advisors includes representatives from all of the occupational safety and health disciplines, government agencies and labor unions, and all states in our region have representation on the board.

Major Accomplishments

Major accomplishments for the Center during the past year include the addition of faculty to IH and the HSAT Programs, curricula changes in the IH and OS&E/OIPRT Programs, the establishment of goals, objectives and measures of performance for the Center and all of its programs, and initiation of an innovative interdisciplinary program.

There were three critical additions to the IH faculty during the current project period. Dr. Elizabeth Maples was appointed as an Assistant Professor in the School of Public Health in 2005, Dr. Claudiu Lungu was retained as a tenure track Assistant Professor in July 2005, and Dr. Melissa Norman was retained as an assistant professor in December of 2006.

The IH/HSAT program made curricula changes to address reviewers' comments regarding reducing course requirements and allowing more electives. This was achieved by reducing the credit hours for some courses, changing some courses from requirements to electives, and changing the research requirement from a thesis to a research project, thus reducing the number of hours required to meet that requirement. The PhD program in Industrial Hygiene was reestablished in the spring semester of 2006. The OS&E/OIPRT program made curriculum changes to reduce faculty load for teaching core courses by alternating years on which these courses are offered, thereby facilitating faculty involvement in research. The OIPRT curriculum was modified to include more emphasis on public health and epidemiology.

Practical program planning and developing measures of effectiveness in meeting our goals has been a major initiative of the Executive Committee during the current project period. Beginning at the Executive Committee retreat in 2004, we have worked to establish relevant and challenging goals, objectives, and measures of performance for all DSC programs. This has been a work in progress through our quarterly meetings and annual planning retreats; the latest version of which was agreed upon in January, 2006.

A major accomplishment during this project period was the development of a new model for our field evaluation courses: ENH 680 Field Interdisciplinary Studies and ENH and 681 Interdisciplinary Worksite Evaluations. In these courses students are required to work in interdisciplinary teams to evaluate actual safety and health

problems and propose methods to reduce or eliminate the hazards. In ENH 680, students are presented with lectures on how to conduct background and walkthrough surveys of occupational environments, and how to work effectively in teams. They then participate in a field trip to an industrial site, organized into interdisciplinary teams under the direction of ERC faculty, and conduct a walkthrough survey of an assigned operation or process in the facility. Students then prepare a report of their observations and make recommendations for appropriate controls. In ENH 681 students are assigned to interdisciplinary teams for the purpose of conducting independent evaluations at designated worksites with the goal of solving real-world occupational health problems. The teams interact with the site managers/preceptors and develop reports that describe the problem, cite the applicable standards and regulations, and recommend control methods. These reports are presented to the entire class and faculty in a course-concluding seminar. After a review by the course master and the other course faculty, the reports are presented to the safety and health managers at the sites where the evaluations were conducted. Each student enrolling in ENH 681 is also required to participate in 45 hours of documented interdisciplinary activities in and outside the course. This course also includes a four hour occupational health clinic rotation by IH students at the City of Birmingham Occupational Health Clinic, and OSE students at the Hughston Clinic in Auburn, AL.

ERC Web Site: uab.edu/dsc

A. Center Wide Programs

B. Center Director: Riedar K. Oestenstad, PhD, CIH

C. Administrative Core

Two major Administrative Core initiatives during the current project period were the development goals, objectives, and measures of performance for ERC programs, and the assessment of the effectiveness of our programs in meeting the occupational safety and health training needs in our region. Beginning at the Executive Committee retreat in 2004, we have collaborated to establish relevant and challenging goals, objectives, and measures of performance for all ERC programs. This has been a work in progress through our quarterly meetings and annual planning retreats; the latest version of which was agreed upon in January 2006. The following is a summary of the goals that we have set for our programs:

Goals for the Academic Programs:

- Produce high quality masters and doctoral students
- Maintain well-staffed, highly regarded faculty
- Maintain funded research opportunities for students
- Produce faculty/student publications
- Develop continuing education courses in which faculty are significantly involved

Goals for the Continuing Education / Hazardous Substances and Outreach Programs:

- Increase the use of innovative technologies
- Increase faculty commitment to continuing education offerings
- Review continuing education needs of alumni, employers and industry
- Ensure adequate number of continuing education offerings from each discipline
- Promote outreach efforts in the entire ERC region

Goals for the Administrative Core:

- Promote an occupational medicine presence in the Center
- Stabilize the Industrial Hygiene program
- Provide distance learning academic courses and continuing education offerings
- Improve the effectiveness of the Board of Advisors
- Increase dissemination of information about special populations at risk
- Increase minority recruitment activities
- Increase students' exposure to NORA priorities and sectors
- Enhance interdisciplinary activities
- Promote outreach activities in the entire DSC region

Our second major initiative to be continued is to conduct training needs and impact assessments in our region. Input from the Board of Advisors, surveys of graduates, practicing safety and health professional, employers, and attendees at continuing education programs, and focus groups were used to accomplish this. In the fall of 2005 the CE Program conducted an e-mail survey of 1500 health and safety professionals throughout the southeast and CE participants from past three years. Their responses identified training needs in seven primary areas, and responses to the questions regarding research needs indicated an overwhelming need for research on topics related to health behavior and work organization. Industrial hygiene focus groups in 2005 indicated a need for improving professional judgment in making qualitative assessments. All of this information has been reviewed by the Executive Committee and appropriate changes made to address shortcomings, problems or suggestions.

D. Outreach

The Deep South ERC continues to be a regional resource for practicing occupational safety and health professionals, other academic institutions, government organizations, and industries in this region. Some examples of our services to these organizations are during the project period are listed below:

- Almost all of the graduates from the Center academic programs during the past year took jobs in our region.

- The CE program annually offers a significant number of discipline-specific, as well as interdisciplinary courses throughout the region. We also presented in-house training courses for industries in the region. The program collaborated with a number of governmental agencies and professional organizations to co-sponsor additional programs.
- The Center provided materials to help other educational programs teach or promote the field of occupational safety and health. This included providing faculty lecturers in courses or seminars, and providing materials for undergraduate career days.
- The Center has provided industry with materials and videotapes to help develop in-house training courses, i.e., ergonomics. We have also presented lectures to regional workplaces, and provided assistance to state and local health departments in developing workshops on occupational health and safety.
- Faculty and students in the Center have conducted numerous research projects to assist regional industries with occupational health problems such as hearing conservation, injury control, workplace design, cost containment, hazardous waste control, respirator fit, occupational skin disease, and ergonomic hazards
- Some ERC courses are taught in a video-based format (OSE) or web-based format (IH and OHN), thus permitting persons who are employed full-time in the region and elsewhere to pursue graduate work in occupational safety and health..
- All of the ERC faculty have assisted regional industry by providing numerous no-fee consultations on a variety of occupational safety and health issues.

The Center interacts with various professional organizations on the region including the Alabama Occupational and Environmental Medicine Association, local chapters of the American Association of Occupational Health Nurses, local sections of the American Industrial Hygiene Association and the American Society of Safety Engineers, Public Employees Safety Council of Alabama, and the Alabama chapter of the National Safety Council.

Regional governmental agencies that the Center has interacted with during the project period include the area and regional OSHA, the Anniston Army Depot, the Alabama Department of Public Health, Alabama Department of Forensic Sciences, a number of county health departments across the region, and many local fire departments. The Alabama state OSHA consultation program, "Safe State," supports the Center and collaborates on a variety of programs, most notably the annual Alabama Governor's Safety and Health Conference. There are numerous regional industries that support and interact with the Center. These companies include Neptune, Hagar Hinge, General Electric Corporation, U.S. Alliance, International Paper, Arizona Chemical, USX Corporation, Alabama Power Company, and Wellborn Cabinets.

A significant outreach accomplishment was the presentation of a regional symposium on NORA-related issues in July 2005 at Auburn, AL. The symposium was attended by individuals from private industry, federal and state government agencies, staffers from two U.S. Congressional Representatives for Alabama, academia, and a civil rights advocacy group. The cross section of professions included occupational health physicians, occupational health nurses, industrial hygienists, safety and ergonomic professionals, and undergraduate and graduate students in occupational safety and health. The symposium began with a keynote address by Dr. Sid Soderholm of NIOSH on the new sector-based emphasis of NORA to move research to practice through sector-based partnerships. This was followed by an overview of the occupational safety and health risks of Hispanic workers in the southeast. Research presentations included: "Intervention Effectiveness Research and Risk Assessment" by Cammie Chaumont Menendez of the University of Texas Health Science Center at Houston, and two presentations on "The Social and Economic Consequences of Workplace Illness and Injury" by Dr. Allard Dembe from the University of Massachusetts Medical School Center for Health Policy and Dr. Bert Stover of the University of Washington School of Public Health (ERC). Each presentation was followed by an open discussion led by a selected panel of experts on how research could be applied to the practice of occupational safety and health.

E. Diversity Recruitment

The goal of the DSC has been to maintain minority enrollment in our academic programs at the same or greater percentage as the corresponding percentage in the population of our region. According to U.S. Census Bureau population estimates for 2005, the percentage of African-Americans residing in Alabama, Mississippi, Georgia and Tennessee is about 26%, and the percentage of Hispanics is about 4%. Our past efforts to promote racial and ethnic diversity has resulted in 50% minority representation in the Occupational Health Nursing (OHN) program, 42% in the Occupational Safety and Ergonomics (OSE) Program, and 33% in the Industrial Hygiene (IH) program. Minority students are well represented in our doctoral as well as our masters programs. An example has been the recent graduation of a minority DrPH student from the IH program and a minority PhD student from the OHN program. Additionally, the IH program has one minority DrPH candidate, the OHN program has two minority PhD students, and the OSE program has one minority PhD student. The retention of minority faculty has also been promoted by DSC programs: recently an African-American female has joined the IH faculty, and an African-American female and an Asian-American female have joined the OHN faculty. The Continuing Education (CE) program promotes minority attendance at CE courses by providing information on training opportunities to minority and women-owned businesses, and forwarding information about the DSC and CE course offerings to a listing of minority-owned newspapers and radio stations in our region. As a result of these efforts, 23.4% of attendees at CE offerings during the past year have been from minority groups.

F. Interdisciplinary Coordination

The major accomplishment in interdisciplinary activities was the modification of the format of ENH 680 – 681 Interdisciplinary Field Studies to provide more extensive and intensive interaction by students and faculty. In these courses students are required to work in interdisciplinary teams to evaluate actual safety and health problems and propose methods to reduce or eliminate the hazards. In ENH 680, students are presented with lectures on how to conduct background and walkthrough surveys of occupational environments, and how to work effectively in teams. They then participate in a field trip to an industrial site, organized into interdisciplinary teams under the direction of ERC faculty, and conduct a walkthrough survey of an assigned operation or process in the facility. Students then prepare a report of their observations and make recommendations for appropriate controls. In ENH 681 students are assigned to interdisciplinary teams for the purpose of conducting independent evaluations at designated worksites with the goal of solving real-world occupational health problems. The teams interact with the site managers/preceptors and develop reports that describe the problem, cite the applicable standards and regulations, and recommend control methods. These reports are presented to the entire class and faculty in a course-concluding seminar. After a review by the course master and the other course faculty, the reports are presented to the safety and health managers at the sites where the evaluations were conducted. Each student enrolling in ENH 680 and ENH 681 is also required to participate in 45 hours of documented interdisciplinary activities in and outside each of these courses. This course also includes a four hour occupational health clinic rotation by IH students at the City of Birmingham Occupational Health Clinic, and OSE students at the Hughston Clinic in Auburn, AL.

G. Pilot Projects

Although we did not have a Pilot Project Research Training Program in the current project period, the ERC has funded student research through the NORA research training program. Beginning in 2002, the Executive Committee distributed NORA Funds for student research support on the basis of research support requested by all ERC students through their program directors. Applications included a statement of purpose for the research, an outline of the study design and a requested budget. Applications were distributed among the program directors, and funding decisions were made either at the quarterly directors meeting or by telephone conference call, depending on the urgency of the request. Decisions were based on scientific soundness and if the proposed work was practicable. Using this mechanism, the Executive Committee provided funds directly to the OHN and OS&E programs to support student research on NORA-related topics.

NORA funds were also made available to Arlene Johnson in 2005 to assist in completing her dissertation research on the effect of sleep deprivation on nurse performance. The title of her research was Influence of Sleep Deprivation on Performance and the Occurrence of Error in Night Shift Workers. A total of 289 licensed

nurses in the sample completed the d2 test of attention, the Profile of Mood States, the Pittsburg Sleep Quality index, and a demographic questionnaire that included patient related error and occupational related error items. Results revealed mean psychomotor performance scores that were above the normative means and a significant inverse relationship between psychomotor performance and hours of sleep ($p < 0.0001$). The majority of the sample were sleep deprived (56%) and had poorer sleep quality ($p = 0.00006$) and lower mood states ($p = 0.0094$). Mean psychomotor performance scores were higher than the reported normal means for both the sleep deprived and the non sleep deprived groups. Sleep deprived nurses were more likely to make an occupational error as the performance scores worsened ($p = 0.027$) and had a significantly higher mean ($p = 0.004$) for patient care errors than nurses who were not sleep deprived. No significant relationships were found between sleep deprivation and selected demographic variables. Dr. Johnson completed her dissertation in August 2006.

Funds have also been transferred to the OS&E program to support NORA-related research projects. These funds were used to purchase a set of updated standards (ANSI, ISO, ASAE, JIS and ASTM) that were used in a student research project related to the NORA priority of control technology. Funds were also used to purchase two suites of software (Photomodeler and CINEMA 4D) that together, were used by a masters student under the direction of Dr. Carnahan to create 3-Dimensional forensic animations of industrial accidents that contribute to work-related fatalities and traumatic injuries. The details of accidents to be animated were be drawn from several sources including: OSHA's Fatal Facts, NIOSH white papers, and documented accidents from various industrial sites in Alabama. Funds were also used to supplement salary support to Drs. Davis and Carnahan while they are supervising and working with several of our trainees to integrate the above software into our current NORA related research and laboratory capabilities.

H. NORA

In addition to the NORA support provided to students for research, other funds were used to support conferences and seminars on NORA related subjects. The NORA symposium discussed above in the section on Outreach was supported by NORA funds.

The annual Deep South Center NORA Research Day, attended by all ERC students, highlights the research activities of students in each of the ERC academic programs. After each presentation, time is allowed for an open discussion on the research topic, findings, and application to the field of occupational health and safety. In addition to student presentations, the Center has also been fortunate to have highly regarded occupational health and safety professionals give presentations at two Research Days. Though the use of the Alabama Intercampus Interactive Telecommunications System (IITS), students at UAB and Auburn have also participated in joint journal clubs with discussions led by doctoral students. An example of this is UAB students participating in the excellent OSE journal review seminar series, thus presenting them with an opportunity to participate in critical analysis of OSE research. It is strongly recommended that ERC students' research committees include faculty from occupational safety and health disciplines other than their own.

A. Industrial Hygiene Program Progress Report

B. Program Director: Claudiu Lungu, PhD

C. Program Description

The primary goal of the Industrial Hygiene (IH) component of the Deep South Center (DSC) is to prepare industrial hygiene professionals who will be leaders in the field and active promoters of occupational health and safety practice. The IH program provides students with a comprehensive curriculum that combines the theoretical and applied aspects of IH that will prepare them to excel in the practice of IH and /or conduct research to advance the field and protect the health and safety of workers. Since its inception in 1982, the IH program has graduated 267 masters and doctoral students, almost 65% of whom are still practicing some aspect of IH in the southeast, thus making the program a valuable resource in meeting the IH professional needs of this region. As one of the core academic programs of the DSC, the IH program offers the MPH, MPHA, DrPH, and PhD degrees.

Master's students are prepared for the professional degree through course work, are challenged with a research project, and a summer internship that provides practical application of learned skills in the workplace. The objective of the doctoral research-training program is to prepare students for careers in IH research. Graduates are particularly qualified for teaching or research positions in academic institutions, research laboratories, or government institutions. The continued overall excellence of the program is affirmed by accreditation by the Related Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Claudiu T. Lungu, Ph.D., became the IH program director in June 2005 when he was hired as a tenure track assistant professor in industrial hygiene. Dr. Lungu is assisted in the management of the program by the Center's Director, Dr. Oestenstad, and the other IH faculty in the program, Drs. Maples and Norman and the Department's Program Coordinator, Cherie Hunt. Program Faculty are listed in the following table.

FACULTY	SPECIALTY AREA
Claudiu T. Lungu, MS, Ph.D.	Respiratory Protection, Vapor Exposures, Radiation Physics
R. Kent Oestenstad, PhD, CIH	Aerosols, Respiratory Protection, Noise, and Exposure Evaluation
Melissa Norman, DrPH	Noise Exposure, Hearing Loss, Multiple Exposures
Elizabeth Maples, PhD	Worker Training, Outreach
Michael Ridge, BS, CIH	Ventilation Controls and PPE
Allen Williams, MSPH, CIH, CSP	IH Practice
Todd Hogue, CIH, CSP	Occupational Health & Safety Management
Max Richard, MPH	Health Physics
Mike Mueller, MD, MPH	Occupational Diseases
Judith McBride, MSPH, CIH	Physical Agents, Lab. safety management
Ed Postlethwait, PhD	Toxicology
Rob Thomas, PhD, PE, CPE	Occupational Safety and Ergonomics

A major accomplishment for the IH Program was successful recruitment of additional qualified Industrial Hygiene faculty. The new faculty will bring an important contribution to both the IH and HSAT tracks by re-distributing the teaching and advising load, and increased research productivity. Dr. Lungu has already been successful in being awarded an R01, contributes to the research training of doctoral students, and as a result of excellent previous experience in another ERC, is a strong member of the ERC Executive Committee. Dr. Norman has been retained as a new IH Assistant professor in January 2006. Her area of research interest is noise exposure and hearing loss, and she will teach ENH 626 - Physical Agents.

The IH faculty have strived to maintain a comprehensive and relevant MPH curriculum while meeting the requirements of NIOSH, American Board of Engineering Technology (ABET) and the Council on Education in Public Health (CEPH). An important aspect of this process has been to solicit input from our alumni concerning the adequacy of our curriculum in preparing them for the practice of industrial hygiene. The curriculum is reviewed annually by the IH faculty in consultation with adjunct instructors. These reviews will continue during this project period with an emphasis on the concerns raised by the reviewers. We have been aware of the heavy course load in the IH curriculum and have taken steps to reduce the number of required courses. These have included combining two courses into a single course, eliminating some required courses, changing the research requirement in the MPH curricula from a formal thesis to a research project thus reducing the research hours from nine to five, and increasing the electives to six credit hours. However, these reductions have been to a degree offset by the CEPH requirement that IH students take the 19 hours of the School of Public Health Core Curriculum. Even with these additions, we have reduced the requirement for the two-year MPH from 65 to 57 credit hours and to allow two electives. We also offer a rigorous one-year accelerated MPH for students who graduate from undergraduate IH programs that requires 43 semester hours to complete.

The IH program offers a DrPH in Occupational Health and Safety, and a PhD in Environmental Health Science. In 2000 the PhD degree in Environmental Health Sciences was effectively closed to students interested in IH by virtue of extensive molecular toxicology requirements. However, due to a change in the chair of the department and a reappraisal of the PhD curriculum, the department has developed a PhD degree with three foci: environmental toxicology, environmental policy and industrial hygiene. This curriculum was approved by the School of Public Health Education Policy Committee and went into effect in the spring semester of 2006, and we currently have one IH student enrolled in the PhD program.

See Appendix A for sample plans of studies for these degrees.

D. Program Activities and Accomplishments

- Progress toward Goals:
 - During the 2005-2006 academic year the IH program exceeded our annual goal of 5 enrolled students with 2 MPH, and 3 full-time and 3 part-time doctoral students enrolled in the fall semester 2006.
 - Two additional faculty were retained, thus reaching our goal of at least three full time faculty members.
 - Over a period of two years of enrollment 100% of master's and doctoral students participated in four semesters of interdisciplinary activity (ENH 680 and ENH 681).
 - Within six months of graduation, 100% of our masters students were employed in positions appropriate to their training, and after two years post-graduation, 90% indicated that the program prepared them well for work as an IH, and 100% indicated significant interdisciplinary interaction in their jobs.
 - All of our doctoral graduates are employed in research, academic, or advanced administrative positions. After two years post-graduation, 100% of our doctoral graduates indicated that the program prepared them well for their positions.
 - All of the faculty have received better than satisfactory course evaluations (satisfactory is the goal).
 - They have also been active in the American Industrial Hygiene Association and the American Conference of Governmental Industrial Hygienists as committee chairs, session arrangers and journal reviewers.
- Trainee honors: Amanda Brown received the 2006 George and Florence Clayton Award from the American Industrial Hygiene Foundation.
- Faculty honors:
- Trainee thesis and dissertations:
 - Amanda Brown – Focus Group to Survey Perceived Susceptibility of Pilots to Adenovirus Infection in the Workplace Environment

- Laurie Melson – Identification of Risk Factors for Heat Stress-Induced and Exertional Rhabdomyolysis Among Fire Fighters in the City of Birmingham, Alabama Fire and Rescue Department
- Melissa Norman – Hearing Sensitivity Among Anniston Army Depot Workers
- New faculty positions:
 - Claudiu Lungu, PhD – July 1, 2005
 - Melissa Norman, DrPH – January 10, 2006
- New courses:
- Trainee recruitment: The IH Program conducted recruiting visits to the University of Georgia, Eastern Kentucky University, the University of North Alabama, Jackson State University, Alcorn State University and the University of Louisiana at Monroe during the past year. Past efforts of the HSAT program to promote racial and ethnic diversity has resulted in 33% minority enrollment in our degree programs. To maintain and increase this percentage, we have made contact with Historically Black Colleges and Universities (HBCUs) in our region. We have scheduled seminar presentations at Alabama State University.

E. Program Products

- See Tables for information on students and graduates.
- Publications and presentations:
 - Bartekova, C. Lungu, R. Shmulsky, P. Huelman, Ji Young Park, Laboratory Evaluation of Oriented Strand Board Samples with respect to Volatile Organic Compounds Emission. *Forest Product Journal* 2006; 56(2):85-91.
 - Bartekova, C. Lungu, M. Cheple, and P. Huelman: Research Summary of Indoor Air Quality Monitoring with respect to Volatile Organic Compounds Concentration in New Composite Panel Houses, The Air & Waste Management Association's 99th Annual Conference & Exhibition Proceedings, New Orleans, LA. Paper # 413.
 - Lungu, CT, Quam J. Investigation of Membrane Alteration Influence on Diffusive Sampler Performance, *Journal of Occupational and Environmental Hygiene*, Accepted with revisions.
 - Bartekova, C. Lungu, R. Shmulsky, P. Huelman: A case study of volatile organic compounds in a new Pilot House in St. Paul, Minnesota, *Journal of Occupational and Environmental Hygiene*. In review.
 - Petersen DJ, Hovinga ME, Pass MA, Kohler C, Oestenstad RK, Katholi C. Assuring Public Health Professionals Prepared for the Future: The UAB Public Health Integrated Core Curriculum. *Public Health Reports* 2005;120.
 - Elliott, L. and Oestenstad, RK: Evaluation of the Predictive Abilities of a Qualitative Exposure Assessment Model, *Journal of Occupational and Environmental Hygiene*. In review.
 - Oestenstad, RK. Elliott, L, Beasley, TL: The Effect of Gender and Respirator Brand on the Association of Respirator Fit and Facial Dimensions, *Journal of Occupational and Environmental Hygiene*. In review.
 - Oestenstad, RK, Maples, EH: An Assessment of Environmental Health Practitioners Perceived Capabilities in the Essential Services and Core Competencies, National Environmental Health Association Conference, San Antonio, TX, June 2006.
 - Oestenstad, RK, Maples, EH: Training the Occupational Safety and Health Professional of the Future, Alabama Governor's Safety and Health Conference, Orange Beach, AL, August, 2006.

F. Future Plans

- We plan to continue active recruiting activities to maintain the level of enrollment and diversity in the IH Program. A competing renewal application has been submitted for the IH Program for the 2007 – 2012 project period.
- Continue active participation in interdisciplinary activities with students from other core disciplines: interact in teams, recognize the contributions and perspectives of each discipline, and are involved in focused ERC team activities and projects.

Appendix A

SAMPLE PLAN OF STUDIES FOR TWO-YEAR MPH PROGRAM TRACK (IH)

	Credit Hrs.
Fall Semester Year 1	
ENH 621 Fundamentals of Industrial Hygiene	3
ENH 650 Environmental and Occupational Toxicology & Diseases	5
ENH 661 Air Sampling and Analysis	3
ENH 662 Air Sampling and Analysis Lab	1
BST 600 Biostatistics for Public Health	4
ENH 680 Field Interdisciplinary Studies	1
ENH 691 IH Program Seminar	0.5
Spring Semester Year 1	
ENH 624 Control of Occupational Hazards	3
ENH 625 Industrial Hygiene Case Studies	2
ENH 626 Physical Agents	2
ENH 670 Fundamentals of Occupational Safety and Ergonomics	3
ENH 681 Interdisciplinary Worksite Evaluations	2
ENH 691 IH Program Seminar	0.5
Summer Semester	
ENH 697 Preceptorship in Environmental Health	3
Fall Semester Year 2	
EPI 600 Epidemiology	3
MCH 610 Introduction to Public Health	3
ENH 680 Field Interdisciplinary Studies	1
ENH 691 IH Program Seminar	0.5
ENH 699 Master's Level Project Research	2
XXX XXX Elective	3
Spring Semester Year 2	
ENH 681 Interdisciplinary Worksite Evaluations	2
HB 600 Health Behavior	3
ENH 699 Master's Level Project research	3
XXX XXX Elective	3
ENH 691 IH Program Seminar	0.5
TOTAL HOURS	57

SAMPLE PLAN OF STUDIES FOR MPHA PROGRAM TRACK (ACCELERATED IH)

	Credit Hrs.
Fall Semester	
BST 600 Biostatistics for Public Health	4
EPI 600 Epidemiology	3
ENH 650 Environmental and Occupational Toxicology & Diseases	5
ENH 680 Field Interdisciplinary Studies	1
ENH 691 Industrial Hygiene Seminar	0.5
ENH 699 Master's Level Project Research	2
XXX XXX Elective	3
Spring Semester	
ENH 624 Control of Occupational Hazards (or elective)	3
ENH 625 Industrial Hygiene Case Studies	2
ENH 681 Interdisciplinary Worksite Evaluations	2
HB 600 Health Behavior	3
ENH 691 Industrial Hygiene Seminar	0.5
ENH 626 Physical Agents (or elective)	2
ENH 699 Master's Level Project Research	3
XXX XXX Elective	3
XXX XXX Elective	3
Summer Semester	
ENH 697 Preceptorship in Environmental Health	3
TOTAL HOURS	43

Recommended electives for MPH programs:	Credit Hrs.
ENH 601 Environmental Chemistry*	3
ENH 603 Environmental Management	3
ENH 603 Management of Occupational Health and Safety Programs	3
ENH 610 Environmental Disasters	3
ENH 622 IH Applications for Hazardous Substances*	3
ENH 651 Risk Assessment of Environmental Hazards	2
EPI 610 Principles of Epidemiologic Research	3
EPI 616 Environmental Epidemiology	3
EPI 617 Occupational Epidemiology	3
HCO 607 Public Health Law	3
IH 610 Environmental Hygiene in Developing Countries	2
ENH 663 Fundamentals of Air and Water Pollution	3
ENH 762 Gas Adsorption Kinetics and Thermodynamics	3
ENH 763 Aerosol Technology	3

* Offered in alternate years

SAMPLE PLAN OF STUDIES FOR DrPH PROGRAM

	Credit Hrs.
Public Health (one course from the following)	3
HCO 603 Health Care Policy	
HCO 607 Public Health Law	
Epidemiology (two courses)	4
EPI 610 Principles of Epidemiologic Research I	
EPI 610L Principles of Epidemiologic Research Lab	
(And one from the following)	
EPI 616 Environmental Epidemiology	
EPI 617 Occupational Epidemiology	
Statistics (one course)	3
BST 603 Regression Analysis from the Applied Perspective	
or an Advanced, Computer-based Course chosen in consultation with advisor	
Risk Assessment	
ENH 711 Risk Assessment of Environmental Hazards	3
Environmental Health Management (one course)	3
ENH 602 Environmental Management	
ENH 603 Management of Occupational Health and Safety Programs	
Or a management course chosen in conjunction with advisor	
GRD 717 Principles of Scientific Integrity	3
Electives Chosen with consultation from Advisor	15
ENH 798 Directed Research*	12
ENH 799 Doctoral Research+	15
APPROXIMATE TOTAL HOURS	61

* Directed hours as needed to be admitted to Doctoral candidacy

+ Doctoral Research hours as needed to complete Research

SAMPLE PLAN OF STUDIES FOR THE PhD PROGRAM - INDUSTRIAL HYGIENE FOCUS

	Credit Hrs
Fall Semester Year 1	
ENH 700 Scientific Basis of Environmental Health	3
ENH 721/TOX 711 Principles of Toxicology	3
ENH 790 Current Topics in Environmental Health Sciences Research	1
ENH 791 Advanced Environmental Health & Toxicology Seminar	1
ENH 796 Environmental Health Sciences Laboratory Research	3
Elective At least one elective at the discretion of Student and Mentor	3
EPI 616 Environmental Epidemiology recommended	
Spring Semester Year 1	
ENH 701 Environmental Chemistry	3
ENH 722/ TOX 712 Actions and Assessment of Toxicants	3
ENH 790 Current Topics in Environmental Health Sciences Research	1
ENH 791 Advanced Environmental Health & Toxicology Seminar	1
ENH 796 Environmental Health Sciences Laboratory Research	3
Elective At least one elective at the discretion of Student and Mentor	3
EPI 617 Occupational Epidemiology recommended	
Summer Semester Year 1	
ENH 796 Environmental Health Sciences Laboratory Research	3
GRD 717 Principles of Scientific Integrity	3
(Can be taken at a later date, required for graduation)	
Total (first year)	34
By mid-summer of the first year, the student selects a dissertation advisor (mentor)	
Fall Semester Year 2	
ENH 790 Current Topics in Environmental Health Sciences Research	1
ENH 791 Advanced Environmental Health & Toxicology Seminar	1
ENH 796 Environmental Health Sciences Laboratory Research	6
BST 611 Intermediate Statistical Analysis I	3
Elective At least one elective at the discretion of Student and Mentor	3
Spring Semester Year 2	
ENH 710 Grant Proposal Writing in Biomedical Sciences	1
ENH 790 Current Topics in Environmental Health Sciences Research	1
ENH 791 Advanced Environmental Health & Toxicology Seminar	1
ENH 796 Environmental Health Sciences Laboratory Research	6
BST 612 Intermediate Statistical Analysis II	3
Elective At least one elective at the discretion of Student and Mentor	3
ENH 770 (Advanced Topics in Environmental Disasters and Public Health recommended)	
Summer Semester Year 2	
ENH 723/ TOX 713 Advanced Topics in Toxicology	3
ENH 798/799 Doctoral-Level Directed Research/Dissertation Research	3
Total (second year)	34

Note: Students must register for a journal club each semester starting the second year. Suggested journal clubs are those administered through the Department of Pathology or Pharmacology/Toxicology.

Note: For the elective, one semester of epidemiology is strongly suggested. These courses may be taken either before or after the comprehensive exam.

Note: Student selects members to serve on dissertation committee and must have introductory (first) dissertation committee meeting within the Fall or Spring Semesters of their second year

Note: ENH 798 (Doctoral Level Directed Research) requires passing the Comprehensive Exam, whereas, ENH 799 (Dissertation Research) requires both passing the Comprehensive Exam and Admission to Candidacy. The Comprehensive Qualifying Examination must be passed by the Summer Semester of the Second Year (Admission to Candidacy)

Third/Forth/Fifth Years

The following courses should be taken each term until graduation (ENH 790 and ENH 791 are offered in the Fall and Spring semesters).

ENH 790	Current Topics in Environmental Health Sciences Research	1
ENH 791	Advanced Environmental Health & Toxicology Seminar	1
ENH 799	Dissertation Research	6-9

Note: Students must register for a journal club or seminar series each semester.

University of Alabama at Birmingham
 Program Director: Lungu, Claudiu
 Discipline: Industrial Hygiene

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled ¹	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses ²	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
MPH	Master of Public Health	2	2	2	0	0	1
Doctorate degree							
DrPH	Doctor of Public Health	4	4	3	0	0	1
PhD	Doctor of Philosophy	1	1	0	0	0	0
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency.)³							
Other (specify, e.g., undergraduate certificate program trainees)							

Refer to: Supplemental Instructions, page 8.

¹ Trainee counts include all students in the approved programs.

² Does not include trainees counted in any of the full-time or part-time categories

³ In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

University of Alabama at Birmingham
 Program Director: R. Kent Oestenstad
 Discipline: Industrial Hygiene

Table 13
Minority Recruitment Data¹
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment
1	1	1	1	In Training - On leave		

Refer to: Supplemental Instructions, page 11.

¹ First three columns are a group total; last four columns refer to individual trainees.

A. Hazardous Substances Academic Training Program Progress Report

B. Program Director: Claudiu Lungu, PhD

C. Program Description

The primary goal of the Hazardous Substances Academic Program (HSAT) of the Deep South Center is to prepare graduate level industrial hygienists with specialization in the industrial hygiene (IH) aspects of handling hazardous substances. The HSAT Program is a component of the strong IH Program of the Center. Since the inception of the HSAT program in July 1996, 18 students have graduated with a Master of Science in Public Health (MSPH) or MPH degree. Claudiu T. Lungu, Ph.D. is the IH and HSAT programs director. The core faculty in the HSAT Program and their specialty areas are listed in the following table:

FACULTY	SPECIALTY AREA
Claudiu T. Lungu, MS, Ph.D.	Respiratory protection, exposure to vapor, radiation.
R. Kent Oestenstad, PhD, CIH,	Aerosols and exposure evaluation
Melissa Norman, DrPH	Noise exposure, hearing loss, multiple exposures
Giuseppe Squadrito, PhD	Environmental Chemistry
Michael Ridge, BS, CIH	Ventilation Controls and PPE
Allen Williams, MSPH, CIH, CSP	IH Practice
Judith McBride, MSPH, CIH	Physical Agents, Lab. safety management
Todd Hogue, MSPH, CIH, CSP	Occ. Health Management
Max Richard, MPH	Health Physics
Elizabeth H. Maples, PhD	CE courses development, evaluation training, outreach

A major accomplishment for the IH/HSAT Program was successful recruitment of additional qualified Industrial Hygiene faculty. The new faculty will bring an important contribution to both the IH and HSAT tracks by re-distributing the teaching and advising load, and increased research productivity. Dr. Lungu has already been successful in being awarded an R01, contributes to the research training of doctoral students, and as a result of excellent previous experience in another ERC, is a strong member of the ERC Executive Committee. Dr. Norman has been retained as a new IH Assistant professor in January 2006. Her area of research interest is noise exposure and hearing loss, and she will teach ENH 626 - Physical Agents.

Positive adjustments have been made in the curriculum to provide more electives and prepare students for IH roles of the future. HSAT students have the opportunity to take another elective besides the HSAT required classes: ENH 601 - Environmental Chemistry, ENH - 602 Environmental Management, and ENH 622 - IH Applications for Hazardous Substances. Required credit hours were reduced by changing ENH 661 - Air Sampling and Analysis from four hours to three hours to eliminate overlap with ENH 621 -Fundamentals of Industrial Hygiene. ENH - 626 Physical Agents was reduced from three semester hours to two hours by omitting discussion of pressure extremes and tightening the presentations of other material. The following three semester hour environmental health courses were changed from required courses to electives: ENH 651 - Risk Assessment of Environmental Hazards, and ENH - 660 Fundamentals of Air and Water Pollution. Also a new course, ENH 603 - Management of Occupational Health and Safety was also added as an elective. This course will be strongly recommended to all IH/HSAT masters students. Another change that has occurred during the 2005-2006 academic year was the requirement for a research project rather than a masters thesis for IH/HSAT students. A research paper having the same content requirements as a thesis became the venue to fulfill the master level project research requirement. Besides a research paper that will describe original, field or laboratory research students can choose another option such as a review paper on a relevant IH topic, a study design project aimed to investigate certain health exposures or outcomes, an original web or video based educational material for occupational health and safety, an occupational health plan for implementation of occupational health practices or controls, as well as other materials that are considered relevant by the research mentor. See Appendix A for a sample plan of studies.

D. Program Activities and Accomplishments

- Progress toward Goals: During the 2005-2006 academic year the HSAT program met our annual goal with 3 enrolled masters students, and three new HSAT students have enrolled in the fall semester 2006.
- Trainee honors:
- Faculty honors:
- Trainee thesis and dissertations:
 - Brit Davis - Correlation of Noise Measurements Made at 3 dB and 5 dB Exchange Rates
 - Kevin Grissom - Comparison of Fit Factors Between Male and Female Respirator Wearers
- New faculty positions:
 - Claudiu Lungu, PhD – July 1, 2005
 - Melissa Norman, DrPH – January 10, 2006
- New courses:
- Trainee recruitment: The HSAT Program conducted recruiting visits to the University of Georgia, Eastern Kentucky University, the University of North Alabama, Jackson State University, Alcorn State University and the University of Louisiana at Monroe during the past year. Past efforts of the HSAT program to promote racial and ethnic diversity has resulted in 33% minority enrollment in our degree programs. To maintain and increase this percentage, we have made contact with Historically Black Colleges and Universities (HBCUs) in our region. We have scheduled seminar presentations at Alabama State University.

E. Program Products

- See Tables for information on students and graduates.
- Publications and presentations:
 - Bartekova, C. Lungu, R. Shmulsky, P. Huelman, Ji Young Park, Laboratory Evaluation of Oriented Strand Board Samples with respect to Volatile Organic Compounds Emission. *Forest Product Journal* 2006; 56(2):85-91.
 - Bartekova, C. Lungu, M. Cheple, and P. Huelman: Research Summary of Indoor Air Quality Monitoring with respect to Volatile Organic Compounds Concentration in New Composite Panel Houses, The Air & Waste Management Association's 99th Annual Conference & Exhibition Proceedings, New Orleans, LA. Paper # 413.
 - Lungu, CT, Quam J. Investigation of Membrane Alteration Influence on Diffusive Sampler Performance, *Journal of Occupational and Environmental Hygiene*, Accepted with revisions.
 - Bartekova, C. Lungu, R. Shmulsky, P. Huelman: A case study of volatile organic compounds in a new Pilot House in St. Paul, Minnesota, *Journal of Occupational and Environmental Hygiene*. In review.
 - Petersen DJ, Hovinga ME, Pass MA, Kohler C, Oestenstad RK, Katholi C. Assuring Public Health Professionals Prepared for the Future: The UAB Public Health Integrated Core Curriculum. *Public Health Reports* 2005;120.
 - Elliott, L. and Oestenstad, RK: Evaluation of the Predictive Abilities of a Qualitative Exposure Assessment Model, *Journal of Occupational and Environmental Hygiene*. In review.
 - Oestenstad, RK. Elliott, L, Beasley, TL: The Effect of Gender and Respirator Brand on the Association of Respirator Fit and Facial Dimensions, *Journal of Occupational and Environmental Hygiene*. In review.
 - Oestenstad, RK, Maples, EH: An Assessment of Environmental Health Practitioners Perceived Capabilities in the Essential Services and Core Competencies, National Environmental Health Association Conference, San Antonio, TX, June 2006.
 - Oestenstad, RK, Maples, EH: Training the Occupational Safety and Health Professional of the Future, Alabama Governor's Safety and Health Conference, Orange Beach, AL, August, 2006.

F. Future Plans

- We plan to continue active recruiting activities to maintain the level of enrollment and diversity in the HSAT Program. A competing renewal application has been submitted for the HSAT Program for the 2007 – 2012 project period.
- Continue active participation in interdisciplinary activities with students from other core disciplines: interact in teams, recognize the contributions and perspectives of each discipline, and are involved in focused ERC team activities and projects.

Appendix A

SAMPLE PLAN OF STUDIES FOR MPH PROGRAM (IH/HSAT)

	Credit Hrs.
Fall Semester Year 1	
BST 600 Biostatistics for Public Health	4
ENH 620 Environmental and Occupational Toxicology & Diseases	5
ENH 621 Fundamentals of Industrial Hygiene	3
ENH 661 Air Sampling and Analysis	3
ENH 661L Air Sampling and Analysis Lab	1
ENH 680 Field Interdisciplinary Studies	1
ENH 691 IH Program Seminar	0.5
Spring Semester Year 1	
ENH 624 Control of Occupational Hazards	3
ENH 625 Industrial Hygiene Case Studies	2
ENH 626 Physical Agents	2
ENH 670 Fundamentals of Occ Safety & Ergonomics	3
ENH 681 Interdisciplinary Worksite Evaluations	2
ENH 691 IH Program Seminar	0.5
Summer Semester Year 1	
ENH 697 Preceptorship in Environmental Health	3
Fall Semester Year 2	
EPI 600 Introduction to Epidemiology	3
MCH 610 Introduction to Public Health	3
ENH 680 Field Interdisciplinary Studies	1
ENH 691 IH Program Seminar	0.5
ENH 699 Master's Level Project Research	2
XXX XXX Elective	3
XXX XXX Elective	3
Spring Semester Year 2	
HB 600 Health Behavior	3
ENH 681 Interdisciplinary Worksite Evaluations	2
ENH 699 Master's Level Project Research	3
XXX XXX Elective	3
ENH 691 IH Program Seminar	0.5
Total Hours	60

HSAT Electives (must take at least two)

*ENH 601 Environmental Chemistry	3
ENH 602 Environmental Management	3
*ENH 622 IH Applications for Hazardous Substances	3
* Offered in alternate years	

Recommended General Electives

ENH 603 Management of Occupational Health and Safety Programs	3
ENH 610 Environmental Disasters	3
ENH 651 Risk Assessment of Environmental Hazards	3
EPI 610 Principles of Epidemiologic Research	3
EPI 616 Environmental Epidemiology	3
EPI 617 Occupational Epidemiology	3
HCO 607 Public Health Law	3
IH 610 Environmental Hygiene in Developing Countries	2
ENH 762 Gas Adsorption Kinetics and Thermodynamics	3
ENH 763 Aerosol Technology	3
ENH 663 Fundamentals of Air and Water Pollution	3

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Lungu, Claudiu T.
 Discipline: Hazardous Substances Academic Training

Table 13
Minority Recruitment Data¹
Previous Budget Period: July 1, 2005 - June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment

Refer to: Supplemental Instructions, page 11.

¹ First three columns are a group total; last four columns refer to individual trainees.

A. Occupational Health Nursing Program Progress Report

B. Program Director: Kathleen C. Brown, RN, PhD

C. Program Description

The primary goal of the Occupational Health Nursing (OHN) Component of the Deep South Center is to prepare occupational health nursing graduates who will function as leaders in the field, and interact fully with other occupational health professionals in planning and implementing occupational health programs. NIOSH approved and funded occupational health nursing studies in the master's program at the University of Alabama School of Nursing in 1983 and doctoral studies in 1988. Current degrees offered include the PhD and MSN. Our enrollment during 2005-2006 was six PhD students and ten MSN students (50% minority; 6 African-American students and two Asian students). The occupational health nursing faculty includes seven School of Nursing faculty members and seven affiliate faculty.

Dr. Kathleen Brown is Program Director of Occupational Health Nursing and provides leadership in development and implementation of OHN program offerings and interdisciplinary interaction with other ERC disciplines. The following table lists the members of the OHN core faculty:

CORE FACULTY	SPECIALTY AREA
Kathleen C. Brown, RN, PhD	Back injury prevention, management
Michael Weaver, RN, PhD	Worksite wellness, statistics/CV risks
Erica Pryor, RN, PhD	Epidemiology, bioterrorism, infection control
Gail Hill, CRNP, PhD	Primary care, injury management
Arlene Johnson, CRNP, PhD	Health care workers, error, sleep deprivation
Na-Jin Park, RN, PhD	Occupational stress, health risks
Debra Baldwin, CRNP, MSN, MBA	Injury management, health promotion

The OHN program offers a MSN degree with an individualized study option or an Occupational Health Nurse Practitioner Option (OHNP). The goal of the master's program is to prepare occupational health nurse graduates to function as leaders in the field, provide advanced level occupational health nursing services, and interact fully with other occupational health professionals in planning and implementing occupational health programs. The goal of the OHN Individually Designed Study option is to prepare graduate level OHNs who can assume advanced positions in industry, clinics, and government providing specialized nursing expertise in the occupational health field. It is expected that very highly motivated students who seek graduate preparation in occupational health nursing will be successful in this option. The goal of the OHNP Option is to prepare nurse practitioners for occupational health care settings. Graduates are eligible to sit for the ANCC and the American Academy of Nurse Practitioners Adult Nurse Practitioner certification examinations.

The doctoral study option for occupational health nurses received initial NIOSH support for the DSN in 1988 and was approved for the PhD program beginning 1998. The DSN program was phased out and in September 1999 the first PhD students enrolled. The shift to a PhD program was important to remain competitive in our recruitment of the highest caliber of students for OHN. This sharpened and differentiated focus takes into account UAB's designation as a research extensive institution, the strengths of the UAB interdisciplinary environment, and the research expertise of UASON faculty. The specific goal of the PhD program for OHN is to prepare nurse researchers to conduct research that will contribute to NORA priorities in occupational health

and safety and delivery of occupational health services. Occupational health research training opportunities and skills of our faculty constitute strengths in the School of Nursing doctoral program.

See Appendix A for a sample plan of studies for these programs.

D. Program Activities and Accomplishments

- Progress toward Goals:
 - The OHN program exceeded its trainee goals in 2005-2006 with 10 enrolled MSN students (5 is goal) and six enrolled doctoral students in 2005-2006 (3 is goal).
 - The OHN faculty actively participate in promoting ERC continuing education for OHNs. Faculty participate on planning committees, provide lectures and consultation in CE activities, and are very active in outreach.
- Trainee honors:
- Faculty honors:
 - Dr. Brown is a member of the NIOSH Board of Scientific Counselors (BSC)
- Trainee thesis and dissertations:
 - Arlene Johnson - The Influence of Sleep Deprivation on Performance and Occurrence of Error in Nurses Who Work the Night Shift
- New faculty positions:
- New courses:
- Trainee recruitment:
 - In minority recruitment efforts, OHN faculty visited Tuskegee University and attended the National Black Nurses' Association Southeastern Regional Education Symposium. Of the six doctoral students and 10 MSN students enrolled during 2005-2006, eight OHN students represented minority groups (six African-American and two Asian). The OHN program was successful in having 50% of the students representing minority groups

E. Program Products

- See Tables for information on students and graduates.
- Publications and Presentations
 - James N, Miller C, Brown K, Weaver M. Pain Disability Among Older Adults with Arthritis. *J Aging Health* 2005; 17: 56-69.
 - Kaewthummanukul T, Brown K, Weaver M, Thomas R. Predictors of exercise participation in female hospital nurses. *J Adv Nurs* 2006; 54: 663-675.
 - Kaewthummanukul T, Brown K. Determinants of employee participation in physical activity: A critical review of the literature. *AAOHN J* 2006; 54: 249-261.
 - Ahmed A, Centor R, Weaver M, Perry G. A Propensity Score Analysis of the Impact of ACE Inhibitors on 4-Year Survival of Older Adults with Heart Failure and Perceived Contraindications. *Am Heart J* 2005; 149:737-743.
 - Giger J, Strickland O, Weaver M, Taylor H, Acton R (2005). Genetic predictors of coronary heart disease risk factors in pre-menopausal African-American women. *Ethnicity & Disease* 2005; 15: 21-231.
 - James N, Miller C, Brown K, Weaver M. Pain Disability Among Older Adults with Arthritis. *J Aging Health* 2005; 17: 56-69. Terndrup T, Nafziger S, Weissman N, Casebeer L, Pryor E. Online bioterrorism continuing medical education: Part I, development and preliminary testing. *Acad Emer Med* 2005; 12:45-50.
 - Broome M, Pryor E, Habermann B, Pulley L & Kincaid H. The Scientific Misconduct Questionnaire-Revised (SMR-Q): Validation and psychometric testing. *Accountability in Research* 2006; 12: 263-28.
 - Pryor E, Heck E, Norman L, Weiner B, Mathews R, Black J, Terndrup T. Integrated decision-making in response to weapons of mass destruction incidents: Development and initial evaluation of a course for healthcare professionals. *Prehospital and Disaster Med* 2006; 21: 24-30.

- Pryor E, Habermann B, Broome E. (In press). Scientific misconduct from the perspective of research coordinators: A national survey. J of Med Ethics.
- Appel S, Floyd N, Giger J, Weaver M, Luo H, Hannah T, Ovalle E. African American women, metabolic syndrome, and national cholesterol education program criteria: a pilot study. Nurs Res 2005; 54:339-46.
- Giger , J, Strickland O, Weaver M, Taylor H, Acton R. (2005 Spring). Genetic predictors of coronary heart disease risk factors in premenopausal African-American women. Ethn Dis 2005; 15:221-32.

F. Future Plans

- Actively recruit students for both the OHNP and Individualized Study Option in OHN, and provide quality doctoral education in OHN.
- Continue active participation of ERC OHN students in interdisciplinary activities in which students from other core disciplines interact in teams, recognize the contributions and perspectives of each discipline, and are involved in focused ERC team activities and projects.
- Provide OHN services that can be utilized for clinical and research training. The OHN program at the Deep South ERC will continue to be a provider of OHN services and will sustain our well-established educational model of focused practice, research, and teaching in occupational health nursing for undergraduate and graduate nursing students.
- Participate in ERC and SON efforts to market our programs through website, brochures, booth displays and mailings

Appendix A

SAMPLE PLAN OF STUDIES FOR MSN PROGRAM- OHNP

Fall Semester Year 1

NUR 612 Advanced Pathophysiology	3
NAH 614 Assessment and Diagnostic Reasoning	4
NUR 601 Role Development for Advanced Nursing Practice	3
ENH 621 Fundamentals of Industrial Hygiene	3
ENH 680 Field Interdisciplinary Studies	1

Spring Semester Year 1

NUR 630 Principles of Epidemiology	3
NUR 613 Pharmacology and Therapeutics	3
NOH 621 Advanced Occupational Health Nursing I	4
NOH 685 Practicum: Occupational Health Nurse Practitioner	3
ENH 681 Interdisciplinary Worksite Evaluations	2

Summer Year 1

NUR 600 Research and Statistics for Advanced Practice	4
NOH 622 Advanced Occupational Health Nursing II	4
NOH 686 Practicum: Occupational Health Nurse Practitioner	3

Fall Semester Year 2

ENH 650 Envir & Occ Toxicology and Disease	5
NOH 692 Residency: Occupational Health Nurse Practitioner	6
XXX XXX Elective	2
NUR 698 Research Practicum	1
ENH 680 Field Interdisciplinary Studies	1

Spring Semester Year 2

NUR 602 Issues Affecting Nursing Practice	3
ENH 670 Fundamentals of Occupational Safety and Ergonomics	3
XXX XXX Elective	2
NUR 670 Occupational Health Management Principles	1
NUR 698 Research Practicum	1
ENH 681 Interdisciplinary Worksite Evaluations	2

Total 67 hours

SAMPLE PLAN OF STUDIES FOR MSN PROGRAM- OHN Individualized Option

Fall Semester Year 1

NUR 600 Research and Statistics for Advanced Practice	4
NUR 601 Role Development for Advanced Nursing Practice	3
NOM 611 Creativity Resources, PS Tools, HealthCare Quality	2
ENH 680 Field Interdisciplinary Studies	1

Spring Semester Year 1

NUR 630 Principles of Epidemiology	3
NUR 602 Issues Affecting Advanced Practice	3
ENH 670 Fundamentals of Occupational Safety and Ergonomics	3
NUR 698 Research Practicum	1
ENH 681 Interdisciplinary Worksite Evaluations	2

Summer Term Year 1

NOM 620 Patient/Stakeholder Outcomes Process Improvement	2
NUR 698 Research Practicum	1
XXX XXX Elective	2

Fall Semester Year 2

NOM 621 Clinical Process Improvement	2
NUR 691 Practicum	3
ENH 621 Fundamentals of Industrial Hygiene	3
ENH 620 Envir & Occ Toxicology and Disease	5
ENH 680 Field Interdisciplinary Studies	1

Spring Semester Year 2

NOM 622 Organizational Outcomes and Integration of Information	2
NUR 643 Introduction to Nursing Informatics	3
XXX XXX Elective	2
NUR 670 Occupational Health Management Principles	1
ENH 681 Interdisciplinary Worksite Evaluations	2

Total 48 hours

SAMPLE PLAN OF STUDIES FOR PHD PROGRAM- OHN

Fall Semester Year 1

PHIL 770 Philosophy of Science	3
NUR 706 Theory Building in Nursing	3
NST 775 Introduction to Statistical Software Packages: SPSS and SASS	2
NPR 760 Conceptual Foundations of Promoting, Protecting and Restoring Health	3
ENH 680 Field Interdisciplinary Studies	1

Spring Semester Year 1

NST 776 Linear Models for Clinical Nursing Research	3
NRM 733 Qualitative Methods	3
ENH 670 Fundamentals of Occupational Safety and Ergonomics	3
ENH 681 Interdisciplinary Worksite Evaluations	2
NUR 798 Research Practicum	2

Summer Year 1

NRM 770 Design for Nursing Studies I	3
NST 777 Multivariate Statistical Methods for Clinical Nursing Research	3
GRD 717 Scientific Integrity	3

Fall Semester Year 2

NUR 772 Design for Nursing Studies II	3
ENH 621 Fundamentals of Industrial Hygiene	3
ENH 620 Envir & Occup Toxicology & Disease	5
ENH 680 Field Interdisciplinary Studies	1
NUR 798 Research Practicum	2

Spring Semester Year 2

NUR 771 Methods/Measurement in Nursing Research	3
NIC 761 Promoting, Protecting and Restoring Health Interventions	3
NUR 630 Epidemiology	3
XXX XXX Cognate Elective	2
NUR 670 Occupational Health Management Principles	1
ENH 681 Interdisciplinary Worksite Evaluations	2

Summer Year 2

NUR 798 Research Practicum	2
XXX XXX Cognate Elective	2

Year 3 Candidacy

Dissertation	18
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Total 84 hours

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Brown, Kathleen C
 Discipline: Occupational Health Nursing

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled ¹	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses ²	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
MSN	Master of Science in Nursing	11	10	0	0	0	1
Doctorate degree							
PhD	Doctor of Philosophy	6	5	0	0		1
Post-doctoral (include formally registered Occupational Medicine residents in all years of the residency.)³							

Refer to: Supplemental Instructions, page 8.

¹ Trainee counts include all students in the approved programs.

² Does not include trainees counted in any of the full-time or part-time categories

³ In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Brown, Kathleen C
 Discipline: Occupational Health Nursing

Table 13
Minority Recruitment Data¹
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment
Year 2: July 1, 2005 to June 30, 2006						
5	5	3	7	In training	NIOSH	
			8	In training	NIOSH	
			9	In training	NIOSH	
			10	Begins Aug 2006	NIOSH	
			11	Begins Aug 2006	NIOSH	

¹ First three columns are a group total; last four columns refer to individual trainees.

A. Occupational Safety and Ergonomics Program Progress Report

B. Program Director: Robert E. Thomas, PhD

C. Program Description

The primary purpose of the occupational safety and ergonomics (OS&E) program is to train graduate level professionals, with strong backgrounds in the engineering or physical sciences, to conduct research in occupational safety and to identify, analyze and control occupational safety hazards through engineering methodologies and design. An integral part of the program is instruction in the management of these activities, including functioning as leaders in the safety profession. In light of these goals and consistent with the missions of Auburn University as a land-grant institution, i.e., instruction, research, and extension, the specific objectives of the OS&E program are as follows: 1) Instruction. To provide OS&E educational opportunities for both full-time and part-time master's and doctoral students through on-campus and DVD/ web-based course offerings, 2) Research. To advance knowledge in OS&E through faculty and student research, and to enhance the research capabilities of OS&E students by involving them in faculty supervised research activities, and 3 Extension (Continuing Education and Outreach). To provide opportunities for both basic and advanced level continuing education in occupational safety and ergonomics for practicing engineering, supervisory, occupational medical, and safety personnel, provide OS&E educational opportunities for full-time on-campus students at the undergraduate level, and provide assistance on a non-fee basis to those individuals and firms seeking information relative to OS&E. The ISE Department's principal emphasis in the OS&E academic area, since 1980, has been at the graduate level. Masters level OS&E training in both non-thesis (MISE degree) and thesis (MS degree) formats and doctoral level (PhD) training are offered. Enrollment in the OS&E Program during Spring Semester of the 2005-2006 academic year totaled 21 students. Of these, 4 were doctoral (3 full-time) and 17 were masters (7 fulltime). Included in this population were two full time and three part-time minority students. Robert E. Thomas, PhD, PE, CPE, presently serves as program director of the OS&E Program. The OS&E faculty includes four core faculty and 11 support members. These faculty are listed in the following table.

FACULTY	SPECIALTY AREA
Robert E. Thomas, PhD	Ergonomics & Safety Engineering
Gerard A. Davis, PhD	Safety Engineering
Lewis N. Payton, PhD	Biomechanics/Manufacturing
Nathan T. Dorris, PhD	Human Factors
Leo A. Smith, PhD	Safety Engineering
Robert B. Rummer, PhD	Safety Engineering & Ergonomics
Saeed Maghsoodloo, PhD	Statistics
Robert L. Bulfin, PhD	Operations Research
Chan S. Park, PhD	Engineering Economy
Jeffrey S. Smith, PhD	Manufacturing Systems
Jorge Valenzuela, PhD	Operations Research
John L. Evans, PhD	Electronics Manufacturing
R. Kent Oestenstad, PhD	Industrial Hygiene
J. Garth Stauffer, MD	Occupational Medicine
E. Lodree, PhD	Production Systems
V. Jordan, PhD	Quality Control and Statistics

The primary goal of the OS&E program is to encourage and prepare individuals with undergraduate and graduate engineering and science academic preparation to pursue successful careers as occupational safety and ergonomics practitioners and researchers. It is believed that this goal can best be accomplished by involving students in a curriculum that offers a comprehensive overview of occupational safety and ergonomics subject matter and by requiring them to accomplish an in-depth research activity (project/thesis/dissertation) in their selected research topic. Graduates will thus have a broad understanding of the entire field of occupational safety and knowledge of specific areas as their career interests dictate.

Interdisciplinary interaction is a basic tenet of program philosophy that OS&E professionals must be capable of effectively interacting with industrial hygiene, occupational health nursing, and occupational medicine professionals. To this end the curriculum seeks to develop the student's understanding of and respect for the responsibilities and capabilities of all disciplines involved in occupational safety and health practice. This is accomplished through common coursework, clinical rotations in occupational health clinics, attendance at interdisciplinary seminars and teamwork on common interdisciplinary projects.

The Auburn Industrial and Systems Engineering Department offers three graduate degrees, each of which may be pursued by students majoring in OS&E. These degrees are: (1) Master of Industrial and Systems Engineering (MISE), (2) Master of Science (MS), and (3) Doctor of Philosophy (PhD). The MISE is a non-thesis degree (an individual design project is performed) which requires that the student's plan of study include six industrial and systems engineering core courses in addition to specialty area requirements such as the OS&E core described later. The MS and PhD degrees are both traditional research thesis/dissertation based degrees and require that the student, with the assistance of the major professor, develop an individualized plan of study that will prepare the student to conduct the thesis/dissertation research. MS and doctoral students must also satisfy the departmental core requirement. See Appendix A for sample plans of these courses of study.

D. Program Activities and Accomplishments

- Progress toward Goals:
 - Two of the three graduates of the OS&E Program (100%) are presently employed in positions related to occupational injury prevention or OSH, and the third is seeking employment in these areas. The goal is that at the two-year graduation anniversary, 100% of OS&E graduates will indicate that overall, the program prepared them well for work in research, academia, or advanced administrative positions in occupational injury, safety, ergonomics or engineering.
 - OS&E program students receiving NIOSH support were enrolled in a total of 4 semester hours (2 per semester) of interdisciplinary training and engaged in an average of over 55 direct contact hours (Spring semester). The goals are a total of 4 semester hours of interdisciplinary courses and 40 contact hours per academic year.
 - OS&E faculty, as previously explained, consists of 2 full time and 2 part-time faculty with an objective of recruiting a third full time member. The goal is 3 full-time members and the recruiting process for a third faculty member has been initiated (August 2006).
 - Each OS&E faculty member was a PI on one or more extramural grants that provided funded research opportunities for OS&E students. The goal is, on average over three years, for each OS&E faculty to be listed as principal investigators on 1 research grant.
 - OS&E full time faculty developed and served as instructors in four ERC continuing education courses. The goal is to assist in development, implementation or evaluation of 1 professional development course per year.
 - Each OS&E fulltime faculty taught/participated in 2 or more courses that were offered in the Engineering Graduate Outreach Program. The goal is to participate in a minimum of two outreach activities annually.
- Trainee honors:
- Faculty honors: Dr. Davis was appointed as a tenure earning assistant professor
- Trainee thesis and dissertations:

- New faculty positions: Obtained approval to retain an additional full time OS&E faculty
- New courses:
- Trainee recruitment: Recruitment of minorities is a primary recruiting objective of the OS&E program and is accomplished by direct liaison with the College of Engineering's Bellsouth Minority Engineering Program which affords access to organizations such as the Society of Black Engineers where special presentations are made regarding careers in safety, and participation in the annual E-Day activities that brings several thousand high school and junior/community college students to the Auburn University campus. The above strategy has been successful as reflected in the three current, and one incoming minority students in our programs. Our future plans are continue to pursue the above activities and participate in ERC activities in this area, particularly in visits to historically black universities who have undergraduate programs in engineering.

E. Program Products

- See Tables for information on students and graduates.
- Publications and presentations:
 - Holman, G.T., Carnahan, B.J., Thomas, R.E. "Using Surveys to Identify Stressors in Generalized Jobs: A Direct Clustering Method." International Journal of Industrial Ergonomics 36 (2006) 671-677.
 - GA Davis, S Ahuja & EB Hollingsworth ,2005. "Your Establishment Received a Letter from OSHA: Now What?" Journal of the American Society of Safety Engineers, 50(3), 33-37.
 - JM Olson, AK Raj, RE Thomas & GA Davis ,2005. "Tactile Display Landing Safety, Situational Awareness, and Workload Reduction Improvements for the Space Shuttle." Journal of Aviation, Space and Environmental Medicine, accepted (pending changes) for publication.
 - GT Holman, GA Davis & S Maghsoodloo, 2006. "The Effects of Dynamic Movement on Reach Arcs." Submitted (in review), Ergonomics, (5/06).
 - Carnahan, B.J., Dorris, N.T., and Kuntz, L.A., 2005. Designing Anthropomorphic Symbols Using Interactive Evolutionary Design. Information Design Journal and Document Design, 13(3), pp. 179-190.
 - RE Thomas & GA Davis, 2005. "Earning a Ph.D. from an Engineering Based Safety & Ergonomics Program: The Case for a Flexible Campus Based Program." Journal of Safety, Health and Environmental Research (JSHER), 2(2), Feature (4).
 - LR Wade & GA Davis, 2005. "Transitioning Sloped Surfaces: The Effects of Roofing Work on Balance and Falls." Journal of the American Society of Safety Engineers, 50(9), 45-50.
 - LR Wade, GA Davis, TS Marzilli & WH Weimar, 2006. "Information Processing Capacity While Wearing Personal Protective Eyewear." Ergonomics, 49(10), 955-967.
 - LR Wade & GA Davis, 2006. "Postural sway following increased duration to an inclined surface." Accepted (pending changes) for publication in Applied Ergonomics (10/05).
 - GT Holman, GA Davis & S Maghsoodloo, 2006. "The Effects of Dynamic Movement on Reach Arcs." Submitted (in review), Ergonomics, (5/06).
 - Carnahan, B.J., Dorris, N.T. and L. Kuntz, 2005. "Designing Anthropomorphic Symbols Using Interactive Evolutionary Computation," Information Design Journal + Document Design, 13(3): 179-190.
 - Carnahan B.J., Maghsoodloo S., Flynn E.A. and K.N. Barker, 2006. "Statistical Modeling of Prescription Dispensing Error Risk Using a Geometric Probability Distribution," American Journal of Health System Pharmacy, 63, 1056-1061.
 - Glasscock, N.F. and Dorris, N.T., 2006. Warning Degradation and Durability. The Handbook of Warnings, edited by M.S. Wogalter. A volume in the Human Factors and Ergonomics Series (series editor: Gavriel Salvendy). Mahwah, NJ: Lawrence Erlbaum Associates.
 - Payton, M.G., Payton, L.N., "Measuring the Change in Spinal Curvature", American Industrial Hygienists Association (AIHCE 2006), Ergonomics division, Chicago, Illinois, May, 2006. (Elimination of Back Injury).

- Payton, L. N., "Ergonomic Benefits of Lean Manufacturing Cells", American Industrial Hygienists Association (AIHCE), 2006, Innovative Ergonomic Solutions in Manufacturing division, Chicago, Illinois, May 2006. (Ergonomics: Elimination of Workplace Musculoskeletal Injury).
- Payton, L.N., Thomas, R.E., Dengiz, O., "Evolutionary Design of Finite Element Meshes for Injury Biomechanics Research", 3rd Annual Injury Prevention Conference, Birmingham, Alabama, July 2005. (Injury Prevention).

F. Future Plans

- We plan to continue active recruiting activities to maintain the level of enrollment and diversity in the OS&E Program. A competing renewal application has been submitted for the OS&E Program for the 2007 – 2012 project period.
- Continue active participation in interdisciplinary activities with students from other core disciplines: interact in teams, recognize the contributions and perspectives of each discipline, and are involved in focused ERC team activities and projects.

Appendix A

SAMPLE PLAN OF STUDY for MISE/MS – OS&E

Fall Semester Year 1

INSY 6010 Safety Engineering I	3
INSY 7050 Industrial Hygiene and Environmental Hazards	3
INSY 7300 Advanced Engineering Statistics	3
INSY 7090 OSE/IP Seminar- Field Interdisciplinary Studies	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 1

INSY 7020 Safety Engineering II	3
INSY 7420 Linear Programming & Network theory	3
INSY 6600 Manufacturing/Production Economics	3
INSY 7090 OSE/IP Seminar- ENH 680 Inter. Worksite Evals	2
INSY 7950 Departmental Seminar	1
Thesis (For MS candidates)	1

Fall Semester Year 2

INSY 7060 Ergonomics I	3
INSY 7080 Human Factors Engineering	3
INSY 7240 Production and Inventory Control Systems	3
Thesis (For MS candidates)	2
INSY 7090 OSE/IP Seminar- ENH 681 Field Interdisc Studies	2
INSY 7950 Departmental Seminar	
XXX Elective	3

Spring Semester Year 2

INSY 7070 Ergonomics II (Biomechanics)	3
INSY 7030 Manufacturing Systems Design & Analysis	3
Thesis or Project	3
INSY 7090 OSE/IP Seminar- Interdisc Worksite Evals	1
INSY 7950 Departmental Seminar	1
XXX Elective	3

SAMPLE PLAN OF STUDY FOR PhD PROGRAM OS&E

Fall Semester Year 1

INSY 6010 Safety Engineering I	3
INSY 7050 Industrial Hygiene and Environmental Hazards	3
INSY 7300 Advanced Engineering Statistics	3
INSY 7090 OSE/IP Seminar- Field Interdisciplinary Studies	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 1

INSY 7020 Safety Engineering II	3
INSY 7420 Linear Programming & Network theory	3
INSY 6600 Manufacturing/Production Economics	3
INSY 7090 OSE/IP Seminar- ENH 680 Interdisc Worksite Evals	2
NUR 630 Epidemiology	3
INSY 7950 Departmental Seminar	1

Summer Semester Year 1

INSY 8970 Research Methods in OS&E and OIPRT	3
INSY 8010 Advanced Safety Engineering	3
Dissertation or elective	3
INSY 7950 Departmental Seminar	1

Fall Semester Year 2

INSY 7060 Ergonomics I	3
INSY 7080 Human Factors Engineering	3
INSY 7240 Production and Inventory Control Systems	3
Dissertation	2
INSY 7090 OSE/IP Seminar- ENH 681Field Interdisc Studies	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 2(candidacy initiated)

INSY 7070 Ergonomics II (Biomechanics)	3
INSY 7030 Manufacturing Systems Design & Analysis	3
Dissertation or elective	3
Elective	3
INSY 7090 OSE/IP Seminar- Interdisc Worksite Evals	1
INSY 7950 Departmental Seminar	1

Summer Semester Year 2

INSY 8060 Advanced Ergonomics	3
Dissertation	6
Elective	3
INSY 7950 Departmental Seminar	1

Fall Semester Year 3

Dissertation	6
INSY 7090 OSE/IP Seminar- Interdisc Worksite Evals	2
INSY 7950 Departmental Seminar	1
Elective	3

Spring Semester Year 3

Research and Dissertation	12
INSY 7950 Departmental Seminar	1

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Thomas, Robert E.
 Discipline: Occupational Safety and Ergonomics

Table 13
Minority Recruitment Data¹
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment
2	2	1	9	In-training(part-time)	Self	NA
			10	Will enter 1/07	NIOSH and Auburn University	NA

¹ First three columns are a group total; last four columns refer to individual trainees.

A. Occupational Injury Prevention Research Training Program Progress Report

B. Program Director: Robert E. Thomas, PhD

C. Program Description

The primary purpose of the Occupational Injury Prevention Research Training Program (OIPRT) is to train graduate level professionals, with backgrounds in the engineering and physical sciences, on the public health model as applied to occupational injury prevention. Specifically, trainees are taught to: 1). conduct research in occupational injury through multidisciplinary collaborations with experts in occupational epidemiology, public health, medicine, nursing, engineering and safety/human factors-ergonomics, thus encouraging them to employ resources beyond their own areas of interest, and 2) address occupational injury issues through interdisciplinary approaches to problem resolution associated with the public health model (i.e. identify and prioritize problems, quantify and prioritize risk factors, identification of strategies to prevent injuries, implement and evaluate controls, and monitor intervention efforts). The OIPRT is co-located with the Occupational Safety and Ergonomics (OS&E) Program in the Department of Industrial and Systems Engineering (ISE) at Auburn University.

Dr Robert Thomas serves as the OIPRT program director. He and Dr. Jerry Davis are the full time faculty for the OIPRT Program, and Dr John Waterbor and Lewis Payton are part-time members. They are assisted by 12 support faculty. The following table lists the core and support faculty for the OIPRT Program

FACULTY	SPECIALTY AREA
Robert E. Thomas, PhD	Ergonomics & Safety Engineering
Gerard A. Davis, PhD	Safety Engineering
John W. Waterbor, MD, Dr. P.H.	Injury Epidemiology
Lewis N. Payton, PhD	Biomechanics/Manufacturing
R. Kent Oestenstad, PhD	Industrial Hygiene
Kathleen Brown, PhD.,RN	Occupational Health Nursing
J. Garth Stauffer, MD	Occupational Medicine
Robert B. Rummer, PhD	Safety Engineering & Ergonomics
Saeed Maghsoodloo, PhD	Statistics
Robert L. Bulfin, PhD	Operations Research
Chan S. Park, PhD	Engineering Economy
Jeffrey S. Smith, PhD	Manufacturing Systems
Jorge Valenzuela, PhD	Operations Research
John L. Evans, PhD	Electronics Manufacturing
E. Lodree, PhD	Production Systems
V. Jordan, PhD	Quality Control and Statistics

The primary goal of the OIPRT program is to encourage and prepare individuals with undergraduate and/or graduate engineering and science academic backgrounds to pursue successful careers in academia, research and private industry as occupational injury prevention professionals at the doctoral level. It is believed that this goal can best be accomplished by involving students in a curriculum that emphasizes use of the public health model as applied to occupational injury prevention and offers a comprehensive overview of OIPRT, Public

health, occupational safety and ergonomics and engineering subject matter. Trainees are then required to accomplish an in-depth research activity (dissertation) in a particular area of their choice but relating to occupational injury prevention. Graduates will thus have a broad understanding of the entire field of occupational injury prevention, with an emphasis on engineering control, and knowledge of specific areas as their career interests dictate. Interdisciplinary interaction is a basic tenet of program philosophy that OS&E professionals must be capable of effectively interacting with industrial hygiene, occupational health nursing, and occupational medicine professionals. To this end the curriculum seeks to develop the student's understanding of and respect for the responsibilities and capabilities of all disciplines involved in occupational safety and health practice. This is accomplished through common coursework, clinical rotations in occupational health clinics, attendance at interdisciplinary seminars and teamwork on common interdisciplinary projects.

See Appendix A for a sample plan of study for the PhD degree.

D. Program Activities and Accomplishments

- Progress toward Goals:
 - OIPRT Program enrollment during spring semester 2006 was 3 fulltime doctoral students meeting the goal of at least 3 doctoral students per year.
 - Two doctoral students have graduated from the OIPRT Program since its inception. Both students (100%) are presently employed in positions related to occupational injury prevention or OSH. The goal is that at the two-year graduation anniversary, 100% of OIPRT graduates will indicate that overall, the program prepared them well for work in research, academia, or advanced administrative positions in occupational injury, safety, ergonomics or engineering.
 - OIPRT program students receiving NIOSH support were enrolled in a total of 4 semester hours (2 per semester) of interdisciplinary training and engaged in an average of over 55 direct contact hours (Spring semester). The goals are a total of 4 semester hours of interdisciplinary courses and 40 contact hours per academic year.
 - OIPRT faculty, as previously explained, consists of 2 full time and 2 part-time faculty with an objective of recruiting a third full time member. The goal is 3 full-time members and the recruiting process for a third faculty member has been initiated (August 2006).
 - Each OIPRT faculty member was a PI on one or more extramural grants that provided funded research opportunities for OIPRT students. The goal is, on average over three years, for each OIPRT faculty to be listed as principal investigators on 1 research grant.
 - Each of the OIPRT trainees (100%) participated in funded research projects of OIPRT faculty. The goal is for all OIPRT students to participate in faculty funded research activities.
 - OIPRT full time faculty developed and served as instructors in four ERC continuing education courses. The goal is to assist in development, implementation or evaluation of 1 professional development course per year.
 - Each OIPRT fulltime faculty taught/participated in 2 or more courses that were offered in the Engineering Graduate Outreach Program. The goal is to participate in a minimum of two outreach activities annually.
- Trainee honors:
- Faculty honors: Dr. Davis was appointed as a tenure earning assistant professor
- Trainee thesis and dissertations:
- New faculty positions:
- New courses:
- Trainee recruitment:

E. Program Products

- See Tables for information on students and graduates.
- Publications and presentations:
 - Carnahan BJ, Dorris NT, and Kuntz LA. Designing Anthropomorphic Symbols Using Interactive Evolutionary Design. *Inform Design J Doc Design*. 2005; 11:179-190
 - Hayati S, Maghsoodloo S, Devivo MJ, Carnahan BJ. Control Chart for Monitoring Occupational Asthma. *J of Sfty Rsch*, accepted for publication, Oct 05, 10 journal pages.
 - Glasscock NF and Dorris NT. Warning Degradation and Durability. *The Handbook of Warnings*, edited by M.S. Wogalter. A volume in the Human Factors and Ergonomics Series (series editor: Gavriel Salvendy). 2006. Mahwah, NJ: Lawrence Erlbaum Associates.
 - Carnahan BJ and Dorris N.T. User-Centered Symbol Design Through Human-Computer Collaboration. In *Proceedings of the Human Factors and Ergonomics Society 48th Annual Meeting*. 2004. Santa Monica, CA: The Human Factors and Ergonomics Society.
 - Payton, L.N., Thomas, R.E., Dengiz, O., "Evolutionary Design of Finite Element Meshes for Injury Biomechanics Research", 3rd Annual Injury Prevention Conference, Birmingham, Alabama, July 2005.
 - Carnahan BJ, Maghsoodloo S, Flynn EA and Barker KN. Statistical Modeling of Prescription Dispensing Error Risk Using a Geometric Probability Distribution, *Am J of Health System Pharmacy*, 2006; 63, 1056-1061.
 - Holman GT, Carnahan BJ, and Thomas RE. Using Surveys to Identify Stressors in Generalized Jobs: A Direct Clustering Method. *Internat J of Ind Ergonomics* 2006;36:671-77.
 - Wade LR and Davis GA. Postural sway following increased duration to an inclined surface. Accepted (pending changes) for publication in *Appl Ergonomics* (10/05).
 - Olson JM, Raj AK, Thomas RE, and Davis GA. Tactile Display Landing Safety, Situational Awareness, and Workload Reduction Improvements for the Space Shuttle. *J Aviation Space Env Med* 2005. Accepted (pending changes) for publication.
 - Holman GT, Davis GA, and Maghsoodloo S. The Effects of Dynamic Movement on Reach Arcs. Submitted (in review), *Ergonomics* (5/06).

F. Future Plans

- We plan to continue active recruiting activities to maintain the level of enrollment and diversity in the OIPRT Program. A competing renewal application has been submitted for the OIPRT Program for the 2007 – 2012 project period.
- Continue active participation in interdisciplinary activities with students from other core disciplines: interact in teams, recognize the contributions and perspectives of each discipline, and are involved in focused ERC team activities and projects.

Appendix A

SAMPLE PLAN OF STUDY FOR PhD PROGRAM- OIPRT

Fall Semester Year 1

INSY 6010 Safety Engineering	3
INSY 7050 Industrial Hygiene and Environmental Hazards	3
INSY 7300 Advanced Engineering Statistics	3
INSY 7090 OSE/IP Seminar/ENH 680 Field Interdisciplinary Studies	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 1

MCH 610 Overview of Public Health	3
INSY 7420 Linear Programming & Network theory	3
INSY 6600 Manufacturing/Production Economics	3
INSY 7090 OSE/IP Seminar/ENH 681 Interdisc Worksite Evals	2
INSY 7950 Departmental Seminar	1

Summer Semester Year 1

INSY 8970 Research Methods in OS&E and OIPRT	3
Dissertation and/or electives	6
INSY 7950 Departmental Seminar	1

Fall Semester Year 2

INSY 7060 Ergonomics I	3
EPI 610 Principles of Epidemiologic Research	4
INSY 7240 Production and Inventory Control Systems	3
Dissertation	1
INSY 7090 OSE/IP Seminar/ENH 680Field Interdisc Studies	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 2(candidacy initiated)

INSY 7070 Ergonomics II (Biomechanics)	3
INSY 7030 Manufacturing Systems Design & Analysis	3
EPI 603 Injury Epidemiologic Principles and Prevention Strategies Or EPI 617 Occupational Epidemiology	3
INSY 7090 OSE/IP Seminar/ENH 681 Interdisc Worksite Evals	1
INSY 7950 Departmental Seminar	1

Summer Semester Year 2

INSY 8970 Special Topics in OIPRT	3
Dissertation	3
Elective	3
INSY 7950 Departmental Seminar	1

Fall Semester Year 3

Dissertation	6
Elective	3
INSY 7090 OSE/IP Seminar- Interdisc Worksite Evals	2
INSY 7950 Departmental Seminar	1

Spring Semester Year 3

EPI 603 Injury Epidemiologic Principles and Prevention Strategies Or EPI 617 Occupational Epidemiology	3
Research and Dissertation	9
INSY 7950 Departmental Seminar	1

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Davis, Gerard
 Discipline: Occupational Injury Prevention Research Training

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled ¹	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses ²	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
Doctorate degree							
PhD	Doctor of Philosophy	3	3	0	0	0	0
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency) ³							

Refer to: Supplemental Instructions, page 8.

¹ Trainee counts include all students in the approved programs.

² Does not include trainees counted in any of the full-time or part-time categories

³ In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Davis, Gerard
 Discipline: Occupational Injury Prevention Research Training

Table 13
Minority Recruitment Data¹
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment
0						

Refer to: Supplemental Instructions, page 11.

¹ First three columns are a group total; last four columns refer to individual trainees.

A. Continuing Education

B. Program Director: Elizabeth H. Maples, PhD

C. Program Description

The overall goal for the Center's Continuing Education (CE) Program is to meet the educational needs of occupational health and safety professionals in our region through quality offerings. The Center consistently presents informative programs with an emphasis on excellence in education for the adult learner. Through these efforts, the Center has developed a reputation as a regional resource for staff development and professional advancement. The Center has an impressive history of commitment to outreach activities with faculty, staff and students involved. A host of efforts to further the field of occupational health and safety, with each program involved in educational development, presentations, lectures, seminars, consultations and other activities have been initiated by the CE Program.

Elizabeth H. Maples, PhD, has been the CE Program Director since 1987. With over two decades of experience in occupational health and safety and nineteen years of experience in continuing education make Dr. Maples extremely well qualified for her role. She supervises the activities of the CE staff and CE instructors, and is assisted by a dedicated staff of two highly motivated and qualified individuals, Ms. Gigi Talley and Ms. Paulisha Holt. As Project Coordinator, Ms. Talley is proficient in various software programs and has received formal training in the Center's registration software program. She coordinates training activities including meeting space and training materials. Ms. Paulisha Holt is the Center's Technology Coordinator. She maintains the Center's website with current course information, faculty and student news, occupational health and safety news. She assists with marketing of workshops, through the creation of brochures, flyers, and the development of course web-links and assists with the publication of the Center's monthly e-News.

D. Program Activities and Accomplishments

The CE Program strives for excellence, and following the NIOSH guidelines for Centers of Excellence in Occupational Safety and Health Research Training, the CE Program has obtained financial support from other sources to maintain a strong, financially stable CE Program. Of special note, are the CE's activities in Jamaica. With financial support from the UAB Sparkman Center, and a strong commitment from Center Administration and the CE Program, a series of training programs met a tremendous need for public health practitioners and hospital workers to receive training on asbestos risk assessment. By building capacity in Jamaica, our training activities may be preventing exposures to a known carcinogen and therefore leading to better health outcomes. A doctoral student remains committed to this project and is being assisted by Dr. Oestenstad.

The CE Program is reaching across the traditional occupational health and safety professions, as well as reaching many others that have safety and health responsibilities, such as case managers, clinic administrators, security personnel, first responders, human resource managers, legal nurse attorneys, environmental managers, medical services consultants, medical assistants and family nurse practitioners.

Occupational Safety and Ergonomics. Highlights include several new ergonomic workshops developed and implemented with the OSE faculty at Auburn University. Drs. Davis and Thomas have been key players in offering ergonomic workshops with topics including basic ergonomic hazard assessment, terminology and solutions for identified problem areas in industrial and office settings. Additionally, Dr. Davis developed and offered an ergonomic workshop specifically designed for industrial engineers to identify and eliminate ergonomic hazards in industrial settings.

Occupational Health Nursing. Our recognized strength lies in course offerings for individuals performing or managing occupational health testing (spirometry and audiometric). The reputation for these offerings is such that we oftentimes reach course attendance capacity. The course director for the Center's Audiometric Testing and Hearing Conservation workshop, Georgia Holmes, AuD, is recognized by the Council for Occupational Hearing Conservation as being a leader in producing attendees that obtain certification. These programs are also offered as in-house training programs. The Center has a close relationship with the local OHN

association (Central AL Assoc. of OHN) and has collaborated on several workshops, attracting OHNs, safety managers, case managers and others with OH responsibilities.

Occupational Medicine. The Center has a tradition of holding an annual OccMed update, now in its 18th year. The program has been held in September each year, but because of Hurricane Ivan, the OccMed Update was moved to April 2005. The 18th OccMed Update was held on September 15 and 16, 2006, with NIOSH Director, John Howard, MD, MPH as the keynote speaker.

Industrial Hygiene. The majority of CE programs provide ABIH points for practicing CIHs. The Center has a close working relationship with the Alabama Local Section of the AIHA that has resulted in new offerings for industrial hygienists to our region (Risk Assessment, Control Banding, CSP Review). As detailed in the Outreach Narrative, the Center collaborated with the Jamaican Ministry of Health, UAB Sparkman Center for Global Health, and the University of West Indies to develop a sustainable facilities management program for asbestos containing building materials (ACM). As part of this effort, the CE program provided training on building inspections for ACM, air sampling and bulk sample analysis.

Multidisciplinary. For many years, the Center had collaborated with the UAB School of Engineering on an annual Industrial Ventilation Conference. The UAB School of Engineering closed their professional development office and therefore is not offering the *Ventilation Conference*. The Center now collaborates with the University of Arizona Office of Engineering Professional Development to offer this in our region. The Center's *NORA Research Priority Symposium* was definitely a highlight of this reporting period. The symposium brought together researchers, academicians, practitioners and advocates to explore ways to take results research into the practice of worker health and safety.

The Center is privileged to have developed close working relationships with many experts in the occupational health and safety field. An individual's credentials must be reviewed and approved by a majority of the Executive Committee before being named a course director. Individuals with excellent credentials and experiences provide instruction for the Center. Recognizing that evaluation is an essential element as we strive for excellence, we have taken a strategic approach to evaluation. The evaluation program involves several components to determine if the CE Program is meeting course objectives and having a regional impact on work practices at the practitioner level.

During this reporting period, several important needs assessment activities were completed to provide direction for the CE program. In an effort to collect impact evaluations, the CE Program developed a systematic approach to gather information from participants 90 days after the training was offered. Initially, during workshops participants are told of the importance of their input in evaluating the effectiveness of the Center's CE programs. In a follow-up letter, participants, they are reminded that they will receive a survey by mail in a few months. The summaries are shared with course directors, DSC faculty and also posted on our website. The following needs assessments were conducted during this period:

- Interdisciplinary Stakeholders (Physicians, Safety Engineers, Industrial Hygienists, Occupational Health Nurses), February 2005.
- Occupational Health Nurses, 2006.
- Personnel involved in Hazardous Materials / Emergency Response Operations, January 2006
- Stakeholders in Center Program, January 2006.
- Safety Professionals / Safety Engineers, April 2006.

E. Program Products

See Tables 12a, 12b and 12c

F. Future Plans

With financial support from NIOSH for CE activities, the CE Program has set high goals for this project period. A 5 year strategic plan has been developed, drawing on recent needs assessments and input from Center stakeholders. The Executive Committee, with the advice from our Board of Advisors, has continued to develop

and refine Center wide and program specific goals and objectives and their outcome measures. Common goals for the academic programs include developing continuing education courses in which faculty are significantly involved. Goals for the CE program include: increasing the use of innovative technologies, increasing faculty commitment to continuing education offerings, reviewing continuing education needs of alumni, employers and industry, ensuring an adequate number of continuing education offerings from each discipline, and promoting outreach efforts in the entire ERC region. Recognizing that professional development needs are dynamic, our goals and objectives will be periodically revisited to remain effective.

A. Hazardous Substances Training Progress Report

B. Program Director: Elizabeth H. Maples, PhD

C. Program Description

The overall goal of the HST Program is to train professionals who work at hazardous waste sites or who are involved in emergency response incidents with hazardous substances. The Center has received funding under the NIEHS/NIOSH agreement since 1990. The Center has a proven training record and has researched the training needs of the target audience, developed and implemented training, and evaluated the overall HST Program.

Elizabeth H. Maples, PhD, has been the HST Program Director since 1990. She is assisted by Ms. Gigi Talley and Ms. Paulisha Holt. Dr. Maples, Ms. Talley and Ms. Holt have interactive roles, and with limited resources develop, manage and evaluate the program, and provide effective and efficient administration of the HST Program. The HST Program recognizes the importance of qualified, engaging, and credible instructors for its programs. The HST Program is strengthened by the role that the Center faculty play in the overall HST Program. Center faculty from the academic programs are supportive of, and are responsible for various stages and aspects of HST offerings. ERC faculty provide guidance on course topic selection, recommend and approve HST course instructors, and they help identify new, innovative approaches to meet the education needs of the HST target audience. The ERC faculty assists in the selection of instructors by reviewing biographical information of potential instructors and making recommendations for their employment

D. Program Activities and Accomplishments

a. Training Accomplishments

Details on HST offerings that were provided during this period are listed on Tables 12a, b and c. Unique accomplishments were programs offered in collaboration with the Alabama Local Section of the American Industrial Hygiene Association.

Control Banding Workshop : The one day program provided an introduction to control banding, its history, technical basis, limitations and current uses. Case studies and the selection of appropriate levels of controls, from good industrial hygiene practice, local exhaust ventilation and containment were discussed. The emphasis on case studies lead to a lively dialogue among the presenter and attendees. The workshop instructor was Deborah Imel Nelson, PhD, CIH. She is the Director of Strategic Initiatives for the Geological Society of America. She holds a Ph.D. in Environmental Health from the Oklahoma University Health Sciences Center, and has worked as a professional industrial hygienist since 1975. Dr. Nelson was a professor of Civil Engineering and Environmental Science at the University of Oklahoma for 15 years, and recently spent two years as an Occupational Health Scientist at WHO in Geneva. She has given presentations on control banding to local AIHA sections and at national meetings.

Risk Assessment Workshop: Another successful joint venture with the Alabama AIHA, was a one day workshop on risk assessment: *Exposure Assessment Process Part 1: Initial Assessment and Prioritization*. The workshop provided an overview on the knowledge and skills necessary to develop strategies for effectively managing the initial assessment and prioritization of workplace exposures. Topics included: an overview of the exposure assessment process; a summary of basic characterizations; defining similar exposure groups; how to gather information; and, a database demonstration. Barry Graffeo, MSPH, CIH, Associate Consultant Industrial Hygiene with Eli Lilly was the course director. He is a graduate of the UAB IH MSPH program, and is the Associate Consultant Industrial Hygienist of Corporate Industrial Hygiene for Eli Lilly and Company. At Eli Lilly, Barry has revised and managed global company policies and technical requirements for industrial hygiene. He has also integrated engineering exposure controls into master design specifications for their manufacturing and development facilities among other priority projects. He is the past Chair of the AIHA Exposure Assessment Strategies Committee.

b. Needs Assessments

The HST Program continued to evaluate course impact through *Survey Monkey*, a web-based survey instrument, participants are asked four questions:

- *What was the most valuable thing you learned in the course?*
- *Did the course provide you with practical, useful information that you are able to apply on the job?*
- *Do you have any other comments about the course?*
- *Or about the Center?*

Surveys are sent 90 days after the completion of the workshops. Responses are returned electronically in *Survey Monkey*, thus protecting the anonymity of the sender. The Center monitors the response rate to determine if a follow-up message is appropriate. If so, follow-up questionnaires are again sent electronically to all participants. Responses are confidential and used to address course weaknesses and recognize strengths. Through this process, our aim is to collect accounts of policy and programs that were changed or implemented at the participant's organization since attendance at the course; capture lessons learned from participants; and solicit input on program effectiveness from various stakeholders. To date, responses from the impact evaluation have been overwhelmingly positive.

To try to obtain the highest response rate possible if emails and mailed surveys are not returned, phone calls are placed to attendees to improve this important data-collection aspect of our evaluation plan. This has increased our response rate, but plans are to continue to encourage individuals to respond through the *Survey Monkey* to maintain confidentiality.

In 2005, a purchased distribution list was used to reach individuals involved in hazardous materials/emergency response operations. The list included industry and government agency contacts. Web-based surveys were forwarded to individuals on the list and other Center stakeholders. Stakeholders included graduate students, alumnus, Board Members, ERC faculty, CE instructors, and past participants. Key elements from the summarized results of this assessment indicated: 1) preferred months to attend training were March, April, May, and October; 2) preferred locations were Birmingham, Atlanta, Gulf/Panhandle; 3) preferred format was two day and one day short courses; and, 4) preferred topics for training included legal issues, management, risk assessment, exposure evaluation, control strategies, CSP review, and workers' compensation. The summary of this needs assessment was shared with the North Carolina ERC and South Florida ERC to provide guidance for a regional ERC conference.

The Center also turns to its Board of Advisors for direction to determine the educational needs of individuals from state and local government agencies who have responsibilities in handling hazardous substances. The Board has several members with key responsibilities in environmental health issues and hazardous materials response who have provided assistance in developing, implementing and evaluating HST training courses.

Beginning in 2005, the HST Program began an effort to capture demographic information on the attendees of the Center's HST Program. In addition to basic demographic information (ethnicity, education, credentials, and job title), we ask how many people are affected by the attendees work practices as a measure of the potential impact of HST training courses on worker safety and health.

E. Program Products

See Tables 12a, 12b, and 12c.

F. Future Plans

Regional Occupational Health and Safety Conference. In early 2006, the Continuing Education/HST (CE) Program Directors at The University of South Florida, Sunshine Education and Research Center (Sunshine ERC), North Carolina Occupational Safety and Health Education and Research Center (NC ERC) and the Deep South Center for Occupational Health and Safety (Deep South ERC) began discussing the possibility of collaborating to meet regional CE and HST training needs. While plans are in a formative stage, several discussions about feasibility have lead to the drafting of a five year plan for consideration of implementation. The following is a summary of that plan.

The Program Directors have reviewed a needs assessment completed in 2006 by the Deep South ERC and have used the results to develop tentative plans that will incorporate three major levels of activity:

1. An annual jointly sponsored training conference
2. An annual NORA Symposia for faculty, trainees, researchers and practitioners
3. An annual coordinated regional impact/needs assessment

The first planned conference/symposium would be held in June 2008. A two-day conference would include traditional CE/HST training programs, and the third day would be a symposium on NORA research and research to practice (R2P). The purpose of the NORA symposium will be to provide faculty, trainees and practitioners in the entire southeastern U.S. with an opportunity to share and interact about NORA research findings and their applicability to practice. Each year a theme, a location, and lead center will be selected to plan and coordinate the Southeastern Conference on Occupational Safety and Health. A tentative schedule follows:

- June 2008: Year 1: One-day Industrial Hygiene Workshop, One-day Hazardous Substances Training Workshop, NORA Research Symposium, Pensacola, FL. Lead: Deep South ERC
- June 2009: Year 2: One-day Occupational Medicine Workshop, One-day Hazardous Substances Training Workshop and NORA Research Symposium, Orlando, FL. Lead: Sunshine ERC
- June 2010: Year 3: One-day Safety in the Workplace, One-day Hazardous Substances Training Workshop and NORA Research Symposium, Savannah, GA. Lead: NC ERC.
- June 2011: Year 4: One-day Occupational Health Nursing, One-day Hazardous Substances Training Workshop and NORA Research Symposium, Atlanta, GA. Lead: Deep South ERC.
- June 2012: Year 5: Two-day Disaster Preparedness and Response in the Workplace, and NORA Research Symposium, Biloxi, MS or Miami, FL. Lead: Sunshine ERC.

Each Center will be involved in all aspects of the planning, development, implementation and evaluation of the Conference. Specific details on all aspects of the Conference, including course selection, agendas, instructors, training materials, brochures, mailing lists, professional credits, financial management, on-site management, and registration process will be agreed upon and presented in a letter of agreement for each Center to review and approve.

Faculty and trainees from all ERCs, and invited speakers will participate in the NORA Symposium. Practitioners from the community and faculty and trainees from NIOSH TPGs and other universities in the region will be invited to participate as well. A special marketing emphasis will be placed on reaching students and faculty from our region's HBCUs.

During the late fall, draft marketing materials will be developed, the hotel contract will be arranged and the conference agenda will be finalized. In addition, the plans for developing and distributing the annual impact/needs assessment forms will be proposed. In February at the annual NIOSH CE / HST Directors' meeting, Dr. Maples will meet with the HST directors from the other two ERCs to approve the following items:

- Marketing materials for the program
- Final program agenda and materials
- Hotel and logistical arrangements
- Mailing lists that will be purchased and used
- Review results of the annual needs/impact assessment

We believe that the formation of this partnership can make a significant impact on the work practices of occupational and environmental health and safety practitioners in our regions. By combining our resources, the ERCs can avoid possible duplication of effort, while offering dynamic and state-of-the-art training opportunities for practitioners and researchers, and broadening the awareness of NIOSH programs.

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

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Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer						
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other		
Conducting a Risk Assessment for Asbestos Material, 7/19-22/05	IH	15	4	60					15								13	2
Analysis for Asbestos and Evaluating Airborne Asbestos Dust, 7/25-29/05	IH	7	5	35					7								6	1
Facilities Inspection for Asbestos Containing Materials, 8/17-19/05	IH	4	3	12					4									
AHERA Refresher Inspector, 10/07/05	IH	23	0.5	23			9	14							17	2	3	1
AHERA Refresher Management 10/07/05	IH	4	0.5	2			3	1							2		1	1
In-House Respirator Fit Test Training, 06/16/06	IH	5	1	5				2	3						5			
In-House Training Respirator Fit Testing Workshop, 05/12/06	IH	7	1	7				7							7			
Subtotal IH		65	15	144	0	0	12	24	29	33	4	0	4	19	5	0	0	
Spirometry Workshop, 8/8-9/05	OHN	16	2	32			8	1							10			5
Spirometry Workshop Refresher, 8/8/05	OHN	2	1	2			1								1			
Audiometric Testing and Hearing Conservation, 8/10-12/05	OHN	18	2.5	45			11	1							11			6
Audiometric Testing and Hearing Refresher, 8/11/05	OHN	2	1	2			1								2			
Spirometry Workshop, Onsite training 8/24/05	OHN	8	2	16			2								8			
Balancing the Scales in OH, 9/30/05	OHN	24	1	24			15	5							21			2
Spirometry Workshop, 10/24-25/05	OHN	12	2	24			7	2							7			4
Spirometry Workshop Refresher, 10/24/05	OHN	1	1	1			1											1
Audiometric Testing and Hearing Conservation, 10/26-28/05	OHN	13	2.5	32.5			6	1							12			
Audiometric Testing and Hearing Conservation, Refresher 10/27/05	OHN	3	1	3			2								3			
Spirometry Workshop, 12/5-6/05	OHN	9	2	18			1								8			1
Spirometry Workshop, Refresher, 12/5/05	OHN	3	1	3			1								3			

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

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Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer					
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other	
Audiometric Testing and Hearing Conservation, 12/7-9/05	OHN	10	2.5	25		4					6	9	1				
Audiometric Testing and Hearing Conservation, Refresher 12/8/05	OHN	4	1	4		2				2		4					
Audiometric Testing and Hearing Conservation, 12/27-29/05	OHN	8	2.5	20		2				6		8					
Benefits of Occupational Health Providers in Managing WC Cost, 12/28/05	OHN	6	1	6						6							6
Spirometry Workshop, 2/6-7/06	OHN	12	2	24		6				6	11	1					
Spirometry Workshop Refresher, 2/6/06	OHN	1	1	1		1					1						
Audiometric Testing and Hearing Conservation, 2/8-10/06	OHN	13	2.5	32.5		3		3		7	12						1
Audiometric Testing and Hearing Conservation Refresher, 2/9/06	OHN	6	1	6		4				2	5			1			
Central Alabama AOHN Meeting, 2/16/06	OHN	9	0.2	1.8		9					7						2
Managing Trauma & Ocular Injuries Workshop w/ CPR & AED Training, 3/10/06	OHN	14	1	14		11		3			12						2
CPR & AED Training, 3/10/06	OHN	8	0.5	4		5		1		2	5						3
Spirometry Workshop, 4/3-4/06	OHN	11	2	22		5				6	11						
Spirometry Workshop Refresher, 4/3/06	OHN	4	1	4		2				2	4						
Audiometric Testing and Hearing Conservation, 4/5-7/06	OHN	12	2.5	30		7				5	11	1					
Audiometric Testing and Hearing Conservation, Refresher 4/5/06	OHN	7	1	7		5				2	7						
Central Alabama AOHN Meeting, 4/20/06	OHN	11	0.2	2.2		11					9			1			1
Spirometry Workshop Refresher, 5/24/06	OHN	5	1	5		2		1		2	3						
Audiometric Testing and Hearing Conservation, Refresher 5/25/06	OHN	6	1	6		3				3	4						
Spirometry Workshop, 6/5-6/06	OHN	6	2	12		3				3	6						

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

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Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer						
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other		
Spirometry Workshop Refresher, 6/5/06	OHN	1	1	1		1					1							
Audiometric Testing and Hearing Conservation, 6/7-9/06	OHN	12	2.5	30		6	2	1	3	12								
Audiometric Testing and Hearing Conservation, Refresher, 6/8/06	OHN	7	1	7		4			3	7								
Subtotal OHN		284	49.4	467	1	152	5	16	110	235	6	4	5	0	22	0	27	12
Introduction to Systems Safety for Engineers, 7/26/05	OS	10	2	20			1		9	10								
Introduction to Systems Safety for Engineers, 7/19/05	OS	18	2	36		1	1		16	18								
Occupational Noise: Survey and Control, 9/28/05	OS	9	1	9		1	4	4	4	6								3
OSHA Recordkeeping, 9/29/05	OS	12	0.5	6		6	3	3	3	10			1					1
Bloodborne Pathogens, 9/29/05	OS	24	0.5	12		9	5	10	12	12		8	4					
Ergonomic Hazards, 10/18/05	OS	6	1	6		3	1	1	1	5								1
Occupational Noise: Survey and Control, 2/16/05	OS	7	1	7			3	3	4	6								
OSHA Recordkeeping, 5/5/06	OS	14	0.5	7		6	3	3	5	13								1
10 Hour General Industry-PLUS 3/02-3/06	OS	6	1.5	9		3	1		2	6								
ASSE Region IV Conference, 4/20-21/06	OS	92	2	184			5	53	34	70	2							20
ASP Exam Prep Workshop, 6/25-28/06	OS	9	3	27			3	6		8	1							
CSP Exam Prep Workshop, 6/28-30/06	OS	8	3	24			3	5		7								1
Subtotal OS		215	12	347	0	29	15	83	88	171	4	8	5	0	27	0	27	0
Respirator Fit Testing Workshop, 10/03/05	HST	12	1	12		6		2	4	10								
Respiratory Protections Programs, 11/17/05	HST	9	3	27		1	2	2	4	3								1
6th Annual Public Employees Safety Conference, 11/02/05	HST	54	1	54					54									
Confined Space and Rescue for Municipalities, 2/14/06	HST	22	1	22					22									

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

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Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer							
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other			
In-House Training, Confined Space Awareness, 5/3/06	HST	18	1	18					18										
Confined Space and Rescue for Municipalities, 2/14/06	HST	14	1	14				2	12										
Respirator Fit Testing Workshop, 05/22/06	HST	9	1	9		2			1	6									
Subtotal HST		138	9	156	0	9	2	7	120	19	0	0	118	0	0	0	0	0	1
NORA Research Priorities, 7/22/05	Other	42	1	42	2	9	7	9	15	11	3	2							24
Alabama Governor's Safety & Health Conference, 8/29-31/05: Cancelled Due to Hurricane Katrina	Other	0	0																
Industrial Ventilation Conference, 10/17/2005	Other	37	3	111			2	5	30	31	2				1				3
Just Writing Skill, 5/4/06	Other	9	1	9		3	1	2	3	2					3				4
Subtotal Other Category		88	5	162	2	12	10	16	48	44	5	2	4	0	31	0	0	31	2
GRAND TOTALS (All Program Areas)		790	90	1276	3	202	44	146	395	502	19	14	136	19	85	15			

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

Table 12b
Summary of CE Course Offerings by Program Area
Previous Budget Period: July 1, 2005 to June 30, 2006

Course/Seminar Title ¹	Program Area	Total Trainees	Total # of Courses	Total Pers Days	# Trainees by Profession							# Trainees by Employer				
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Subtotal IH	IH	65	5	144	0	0	12	24	29	33	4	0	4	19	5	0
Subtotal OHN	OHN	284	43	467	1	152	5	16	110	235	6	4	5	0	22	12
Subtotal OS	OS	215	12	347	0	29	15	83	88	171	4	8	5	0	27	0
Subtotal HST	HST	138	7	156	0	9	2	7	120	19	0	0	118	0	0	1
Subtotal Other Category	OT	88	4	162	2	12	10	16	48	44	5	2	4	0	31	2
GRAND TOTALS (All Program Areas)		790	71	1,276	3	202	44	146	395	502	19	14	136	19	85	15

Refer to: Supplemental Instructions, page 10.

¹ Group together by Program Area and provide sub-totals for each Program Area.

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Elizabeth H. Maples, PhD

Table 12c
CE Course Offerings - Summary by Program Area
Since Beginning of Current Project Period
July 1, 2004 - August 2006

Program Area	Total # of Trainees	Number of Courses	Total Pers Days	# Trainees by Profession							# Trainees by Employer					
				MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other	
Industrial Hygiene	291	23	475	0	11	72	84	124	183	35	0	32	19	22		
Occupational Health Nursing	1013	114	1567	11	540	13	50	400	853	36	7	41	4	68	4	
Occupational Medicine	294	5	437	115	122	1	5	51	273	4			2	13	2	
Occupational Safety	828	64	869	4	94	17	331	382	716	13	0	7	1	62	29	
Hazardous Substance Training	873	33	1983.5	8	24	48	229	564	223	53	117	339	1	128	12	
Other OS&H	1199	14	3242	2	55	68	720	354	766	42	77	113	12	148	41	
TOTAL	4498	253	8,573	140	846	219	1419	1,875	3014	183	201	532	39	441	88	

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H. Rev. 01/06

Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer						
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other		
Conducting a Risk Assessment for Asbestos Material, 7/19-22/05	IH	15	4	60					15								13	2
Analysis for Asbestos and Evaluating Airborne Asbestos Dust, 7/25-29/05	IH	7	5	35				7									6	1
Facilities Inspection for Asbestos Containing Materials, 8/17-19/05	IH	4	3	12				4										
AHERA Refresher Inspector, 10/07/05	IH	23	0.5	23			9	14						17	2	3		1
AHERA Refresher Management 10/07/05	IH	4	0.5	2			3	1						2	1			1
In-House Respirator Fit Test Training, 06/16/06	IH	5	1	5				2	3					5				
In-House Training Respirator Fit Testing Workshop, 05/12/06	IH	7	1	7				7						7				
Subtotal IH		85	15	144	0	0	12	24	29	33	4	0	4	19	5	0	0	
Spirometry Workshop, 8/8-9/05	OHN	16	2	32			8	1	7					10	1			5
Spirometry Workshop Refresher, 8/8/05	OHN	2	1	2			1		1					1	1			
Audiometric Testing and Hearing Conservation, 8/10-12/05	OHN	18	2.5	45			11	1	5					11				6
Audiometric Testing and Hearing Refresher, 8/11/05	OHN	2	1	2			1		1					2				
Spirometry Workshop, Onsite training 8/24/05	OHN	8	2	16			2		6					8				
Balancing the Scales in OH, 9/30/05	OHN	24	1	24			15	5	4					21		1		2
Spirometry Workshop, 10/24-25/05	OHN	12	2	24			7	2	3					7	1			4
Spirometry Workshop Refresher, 10/24/05	OHN	1	1	1			1											1
Audiometric Testing and Hearing Conservation, 10/26-28/05	OHN	13	2.5	32.5			6	1	6					12		1		
Audiometric Testing and Hearing Conservation, Refresher 10/27/05	OHN	3	1	3			2		1					3				
Spirometry Workshop, 12/5-6/05	OHN	9	2	18			1		8					8	1			
Spirometry Workshop, Refresher, 12/5/05	OHN	3	1	3			1		2					3				

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer						
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other		
Audiometric Testing and Hearing Conservation, 12/7-9/05	OHN	10	2.5	25		4					6			9	1			
Audiometric Testing and Hearing Conservation, Refresher 12/8/05	OHN	4	1	4		2				2				4				
Audiometric Testing and Hearing Conservation, 12/27-29/05	OHN	8	2.5	20		2				6				8				
Benefits of Occupational Health Providers in Managing WC Cost, 12/28/05	OHN	6	1	6						6								6
Spirometry Workshop, 2/6-7/06	OHN	12	2	24		6				6				11	1			
Spirometry Workshop Refresher, 2/6/06	OHN	1	1	1		1								1				
Audiometric Testing and Hearing Conservation, 2/8-10/06	OHN	13	2.5	32.5		3			3	7				12				1
Audiometric Testing and Hearing Conservation Refresher, 2/9/06	OHN	6	1	6		4				2				5		1		
Central Alabama AOHN Meeting, 2/16/06	OHN	9	0.2	1.8		9								7				2
Managing Trauma & Ocular Injuries Workshop w/ CPR & AED Training, 3/10/06	OHN	14	1	14		11			3					12				2
CPR & AED Training, 3/10/06	OHN	8	0.5	4		5	1			2				5				3
Spirometry Workshop, 4/3-4/06	OHN	11	2	22		5				6				11				
Spirometry Workshop Refresher, 4/3/06	OHN	4	1	4		2				2				4				
Audiometric Testing and Hearing Conservation, 4/5-7/06	OHN	12	2.5	30		7				5				11	1			
Audiometric Testing and Hearing Conservation, Refresher 4/5/06	OHN	7	1	7		5				2				7				
Central Alabama AOHN Meeting, 4/20/06	OHN	11	0.2	2.2		11								9		1		1
Spirometry Workshop Refresher, 5/24/06	OHN	5	1	5		2			1	2				3		2		
Audiometric Testing and Hearing Conservation, Refresher 5/25/06	OHN	6	1	6		3				3				4				2
Spirometry Workshop, 6/5-6/06	OHN	6	2	12		3				3				6				

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

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Table 12a
CE Course Offerings by Program Area
July 1, 2005 - June 30, 2006

Course/Seminar Title*	Program Area	Total Trainees	Length of Course	Total Pers Days	# Trainees by Profession							# Trainees by Employer						
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other		
In-House Training, Confined Space Awareness, 5/3/06	HST	18	1	18					18									
Confined Space and Rescue for Municipalities, 2/14/06	HST	14	1	14			2			3								
Respirator Fit Testing Workshop, 05/22/06	HST	9	1	9		2				3								
Subtotal HST		138	9	156	0	9	2	7	120	19	0	0	118	0	0	0	0	1
NORA Research Priorities, 7/22/05	Other	42	1	42	2	9	7	9	15	11	3	2					24	2
Alabama Governor's Safety & Health Conference, 8/29-31/05: Cancelled Due to Hurricane Katrina	Other	0	0															
Industrial Ventilation Conference, 10/17/2005	Other	37	3	111			2	5	30	31	2		1				3	
Just Writing Skill, 5/4/06	Other	9	1	9		3	1	2	3	2			3				4	
Subtotal Other Category		88	5	162	2	12	10	16	48	44	5	2	4	0	0	31	2	2
GRAND TOTALS (All Program Areas)		790	90	1276	3	202	44	146	395	502	19	14	136	19	85	15	15	15

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Maples, Elizabeth H.

Table 12b
Summary of CE Course Offerings by Program Area
Previous Budget Period: July 1, 2005 to June 30, 2006

Course/Seminar Title ¹	Program Area	Total Trainees	Total # of Courses	Total Pers Days	# Trainees by Profession							# Trainees by Employer				
					MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Subtotal IH	IH	65	5	144	0	0	12	24	29	33	4	0	4	19	5	0
Subtotal OHN	OHN	284	43	467	1	152	5	16	110	235	6	4	5	0	22	12
Subtotal OS	OS	215	12	347	0	29	15	83	88	171	4	8	5	0	27	0
Subtotal HST	HST	138	7	156	0	9	2	7	120	19	0	0	118	0	0	1
Subtotal Other Category	OT	88	4	162	2	12	10	16	48	44	5	2	4	0	31	2
GRAND TOTALS (All Program Areas)		790	71	1,276	3	202	44	146	395	502	19	14	136	19	85	15

Refer to: Supplemental Instructions, page 10.

¹ Group together by Program Area and provide sub-totals for each Program Area.

ERC Applicant Institution: University of Alabama at Birmingham
 Program Director: Elizabeth H. Maples, PhD

Table 12c
CE Course Offerings - Summary by Program Area
Since Beginning of Current Project Period
July 1, 2004 - August 2006

Program Area	Total # of Trainees	Number of Courses	Total Pers Days	# Trainees by Profession							# Trainees by Employer					
				MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other	
Industrial Hygiene	291	23	475	0	11	72	84	124	183	35	0	32	19	22		
Occupational Health Nursing	1013	114	1567	11	540	13	50	400	853	36	7	41	4	68	4	
Occupational Medicine	294	5	437	115	122	1	5	51	273	4			2	13	2	
Occupational Safety	828	64	869	4	94	17	331	382	716	13	0	7	1	62	29	
Hazardous Substance Training	873	33	1983.5	8	24	48	229	564	223	53	117	339	1	128	12	
Other OS&H	1199	14	3242	2	55	68	720	354	766	42	77	113	12	148	41	
TOTAL	4498	253	8,573	140	846	219	1419	1,875	3014	183	201	532	39	441	88	