
Graduate Program

Human Factors and Ergonomics

North Carolina
State University



**Department of Psychology
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HUMAN FACTORS and ERGONOMICS

Students in the Human Factors and Ergonomics program (*Curriculum Code*: PSG) may choose to concentrate among several areas of cognitive and perceptual ergonomics for their MS/PhD degrees. At NC State, the Department of Psychology has adopted a scientist-practitioner model of graduate education.

Ergonomics (also known as Human Factors or Engineering Psychology) includes such topics as the design and evaluation of products, systems, and environments; human perception and performance; information processing; environmental stress; and safety and engineering principles. Success also requires the development of research skills and a broad knowledge of psychology.

The Human Factors and Ergonomics (HFE) program emphasizes close contact between faculty and students, with an emphasis on research training gained via apprenticeship relationships. There are usually about 25 students in the program. Many faculty members are drawn from various disciplinary areas and other departmental programs.

The program emphasizes the application of fundamental and applied research to the solution of practical problems. Many students supplement ergonomic courses with courses in computer science, safety, statistics and research methods, and industrial-organizational psychology. Ergonomics at NC State involves both the Department of Psychology and the Department of Industrial and Systems Engineering. Courses in the ISE Department generally emphasize the engineering side of human factors, as well as topics such as biomechanics. Psychology students in the program are free to take courses in both departments.

RESEARCH FACILITIES

The Department is currently housed on two floors of Poe Hall, a modern building on NC State's North Campus. All laboratories and offices are connected to the internet through the campus network. Both Macintosh and Windows operating systems are available in several laboratories.

APPLIED COGNITIVE PSYCHOLOGY LABORATORY: Includes testing rooms and equipment for the display of visual stimuli and the recording of assorted behaviors, such as response time.

AUDITORY PERCEPTION LABORATORY: Includes a 24 ft x 24 ft acoustically-modifiable test room with an adjacent control room housing both computers and specialized equipment (analog and digital) for generating, amplifying and presenting sounds. A large anechoic chamber is available on campus through the cooperation of the Department of Mechanical and Aerospace Engineering. The Auditory Perception Laboratory has been developed for conducting studies of localization in three-dimensional auditory space.

COGNITIVE ERGONOMICS LABORATORY: Computers and a variety of custom-built equipment allow research to be conducted on risk perception and communication, information design, human-computer interaction, and visual search. Video equipment and a variety of computer software, including editing, database and statistical programs are available.

ERGONOMICS AND AGING LABORATORY: A number of individual computer stations and video equipment are available to test older and younger adults on a variety of applied cognitive topics such as medication adherence, human-computer interaction, and product-usability evaluation. Statistical and video-editing software are available.

LEARNING, AGING, COGNITION & ERGONOMICS LABORATORY (LACE): Consists of on-campus and off-campus space for testing the abilities and limitations of older and younger adults. An area is reserved for Research Assistants. Software is available for programming, designing stimuli, and statistical analysis.

VISUAL PERCEPTION LABORATORY: Consists of several rooms where experiments can be conducted, devices for the measurement of visual functioning (including the measurement of accommodation and convergence), and equipment for generating visual displays, as well as a light-sealed observation booth and three visual alleys (up to 24 ft. in length).

USABILITY RESEARCH LABORATORY: Part of the Learning and Research Center for the Digital Age (LRCA) located in D. H. Hill Library at NC State. The URL consists of state-of-the-art usability equipment capable of collecting video, audio, and recorder data in real-time for observation and analysis of user-performance test sessions. It is managed by the Digital Library Initiatives Department and the Learning Technology Service of the NC State Libraries.

PROGRAM REQUIREMENTS

The Department of Psychology admits only those students who plan to complete the PhD. All doctoral students complete at least three courses (9 credits) in statistics and/or research design, as well as a one-credit orientation course, a two-credit ethics sequence, and some distributional courses. NC State requires a minimum of 36 hours for the MS and another 36 hours for the PhD (54 hours for the doctorate, if entering with a previous masters degree).

Specific course requirements are currently under review, due to the discontinuation of the separate track for Experimental Psychology (in December 2007). Other requirements will probably include:

PSY 500	Visual Perception
PSY 508	Cognitive Processes
PSY 591	History and Systems
PSY 752	Action Research
PSY 540	Human Factors in Systems Design
PSY 743	Ergonomic Performance Assessment
PSY 744	Human Information Processing
PSY 502	Physiological Psychology
PSY 704	Learning and Motivation

All **PSG** students are also expected to:

Take a minimum of one additional course or seminar in two of the following content areas: perception, physiological psychology, cognitive processes (or human information processing), developmental psychology, lifespan development or ergonomics. Other courses (to meet university requirements or to satisfy individual educational needs) are a matter of agreement between the student and his/her Graduate Advisory Committee.

HFE students are also expected to develop applied research skills by work in industry, government, or other institutional settings either prior to or during their stay in the department. (This may involve part-time placement during the academic year or summer, or be satisfied by previous work experience.)

PRIMARY AREA FACULTY

James W. Kalat, Professor of Psychology. PhD, Pennsylvania. Professional interests: biological psychology.

Katherine W. Klein, Associate Professor Emerita of Psychology. PhD, Wayne State. Professional interests: attitudes, stress, individual differences and performance.

Sharolyn A. Lane, Associate Professor of Psychology. PhD, Old Dominion. Professional interests: human information processing, organization of long-term memory, visual displays.

David W. Martin, Professor of Psychology. PhD, Ohio State. Professional interests: attention, workload, cognitive modeling.

Christopher B. Mayhorn, Associate Professor of Psychology, PhD, University of Georgia. Professional interests: applied cognitive aging, human factors/ergonomics, medication adherence, human-computer interaction, risk communication.

Anne Collins McLaughlin, Assistant Professor of Psychology, PhD, Georgia Institute of Technology. Professional interests: applied cognitive aging, human factors/ergonomics, learning, training, and human-computer interaction.

Brad Mehlenbacher, Associate Professor of Adult and Community College Education. PhD, Carnegie-Mellon (Departmental Associate). Professional interests: rhetoric and document design, rhetorical theory, online information design and evaluation, web-based instruction, usability testing.

Donald H. Mershon, Professor of Psychology. PhD, California-Santa Barbara. Professional interests: sensory and perceptual processes, visual and auditory spatial judgments.

Slater E. Newman, Professor Emeritus of Psychology. PhD, Northwestern. Professional interests: cognition and its development, the relationship between touch and vision.

Eric N. Wiebe, Associate Professor, Math, Science & Technology Education. PhD, North Carolina State (Departmental Associate). Professional interests: human-computer interaction, computing in organizations, scientific visualization.

Michael S. Wogalter, Professor of Psychology. PhD, Rice. Professional interests: human factors/ergonomics, safety, warnings, risk perception, human-computer interaction, information formatting and design.

ERGONOMICS FACULTY IN INDUSTRIAL ENGINEERING

M. A. Ayoub, Professor of Industrial Engineering. PhD, Texas Tech. Professional interests: biomechanics, safety, modeling, simulation.

Simon M. Hsiang, Associate Professor of Industrial Engineering. PhD, Texas Tech. Professional interests: Bayesian analysis, manual tracking and control, human reliability, biomechanical optimization and simulation, virtual reality.

David B. Kaber, Associate Professor of Industrial Engineering. PhD, Texas Tech. Professional interests: automated systems, level of control, adaptive automation, cognitive ergonomics, human factors in tele-operation and tele-robotics, human-machine system/interface, occupational safety and health, situational awareness in complex systems.

ALLIED FACULTY

Jason C. Allaire, Assistant Professor of Psychology. PhD, Wayne State. Professional interests: cognitive aging as it relates to everyday cognitive functioning, intra-individual variability, and modifiability of the aging mind.

Barry Beith, Adjunct Associate Professor of Psychology, PhD, North Carolina State. Professional interests: mental workload, human-computer interaction, consumer-product ergonomics, safety, cognitive human factors, training.

Patrick J. FitzGerald, Assistant Professor of Design and Technology. MFA, Cranbrook Academy of Art. Professional interests: interface design, educational multimedia software, human-computer interaction, animated intelligent agents.

Denis O. Gray, Professor of Psychology. PhD, Michigan State. Professional interests: older workers, program evaluation, dissemination of innovations, psychology in the public interest.

Anthony Hall, Adjunct Professor of Psychology. Ph.D., North Carolina State. Professional interests: cognitive processes, quantitative modeling and analysis.

Thomas M. Hess, Professor of Psychology. PhD, Southern Illinois. Professional interests: aging and cognition, social cognition, older workers.

James L. Howard, Adjunct Professor of Psychology. PhD, Tulane. Professional interests: psychopharmacology.

James C. Lester, Associate Professor of Computer Science. PhD, Texas-Austin. Professional interests: artificial intelligence, knowledge-based learning environments, intelligent multimedia systems.

Shevaun D. Neupert, Assistant Professor of Psychology, PhD, University of Arizona. Professional interests: daily stressors as they relate to affect, physical health, and memory, across the adult lifespan, and statistical techniques for examining change and intra-individual variability.

Frank Smith, Professor of Psychology. PhD, Michigan State. Professional interests: international development policy, program planning and evaluation in the sector of education, employment and environment; collaboration in research, transfer and adaptation of new technologies and adjustment to technical, structural, and social change.

Robert A. St. Amant, Associate Professor of Computer Science. PhD, Massachusetts. Professional interests: human-computer interaction, intelligent-user interfaces, artificial intelligence.

Lori Foster Thompson, Associate Professor of Psychology. PhD, University of South Florida. Professional interests: individual, team, and organizational reactions to emerging technologies; computer-mediated work behavior; employee surveys; and careers.

Mark Wilson, Associate Professor of Psychology. PhD, Ohio State. Professional interests: job analysis and models of job performance.

OTHER INFORMATION

NC State University is part of the Research Triangle region of North Carolina, which includes Duke University and the University of North Carolina - Chapel Hill, as well as numerous high-tech companies including IBM, Cisco, and SAS. Historically, there have been many opportunities for PSG students to participate in co-op/internship positions within the local area.

ADMISSION

Students are admitted each fall semester. Applications are welcome from students with Bachelor's or Master's degrees. A previous degree in psychology is not required, although some coursework in psychology is highly recommended. Admission is competitive and is based upon past academic performance, as well as Graduate Record Examination scores and letters of recommendation. Previous research experience is highly valued. Program faculty are also interested in learning about any special skills that an applicant may have (e.g., computer programming, experience in using computer software, electronics and wood/metal skills, design training and experience). Applications completed by January 15th are given first consideration for admission and assistantships.

NC State University no longer distributes/uses paper application packages; all applications are handled through the Graduate School and the on-line application system at: <http://www2.acs.ncsu.edu/grad/applygrad.htm> If you need to contact the Graduate School for any other reason, you may do so by telephone (919-515-2872) or by writing to: The Graduate School, NC State University (Box 7102), Raleigh, NC 27695-7102.

Several items are required before an application is complete. In addition to the Graduate School application, these include a personal statement applicable to the program in which you are interested, transcripts of all previous academic work, and three letters of recommendation. Scores on the General GRE must be provided. (The Psychology Subject Test is not required.) The TOEFL is required for most international students. More specific details on what is needed, where to obtain the appropriate forms and/or how to submit required information can be found at:

<http://psychology.chass.ncsu.edu/gradprograms> Select the FAQ page and then Applicants' **FAQ #1**.

SUPPORT

Within the Department of Psychology, a limited number of teaching and research assistantships are available. They provide a stipend of approximately \$12,500 and require half-time work. Assistantship “packages” include health insurance and tuition waivers, if certain conditions are met and the student carries a specified number of hours. A few students may also qualify for special Graduate School supplements. Other forms of financial assistance, available through the Office of Financial Aid, include scholarships, grants, loans, and campus employment.