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Retirement Reception for Dr. John "Doc" Ammons

Clockwise from upper left:

Tatiana & Doc enjoying one of many presentations

Cassie holding baby Lena while sharing her thoughts

Dave McKinney sharing his story about hemp

David Smith & Susan Fiscor

Dr. John Tyner

Darwin Newton

Photo credits: Tim Prather



Continuing clockwise from upper left: Dr. Paul Ayers in deep thought; Doc opening his gift card; Leah Soro and Andrew Sherfy; Dr. Forbes Walker working the crowd.



July 1, 2011

From the Department Head.....

This issue of our newsletter features a number of photos from the recent retirement reception held for Dr. Tom "Doc" Ammons. We had his colleagues, guests, and both current and former students come from all across Tennessee to wish Doc well in his retirement, with several making comments and telling stories about their relationship with Doc. Although it turned into a bit of a "roast," it was evident that he has made a significant impact on a large number of people over the course of his career, and that he has had a major influence on the pedology and soil genesis community in Tennessee and across the southeast. We all wish him well in retirement, and while we know he will continue to be involved in several research projects on campus, we hope that he continues to come by the department and Institute for visits and coffee. Congratulations and best wishes Doc!

Eric

A Growing Interest in Land Surveying

by Don Talend, April 27, 2011

taken from the eNewsletter, Point of Beginning (POB)

http://www.pobonline.com/Articles/Features/BNP_GUID_9-5-2006_A_10000000000001037414

At the University of Tennessee at Knoxville, land surveying instruction is expanding beyond regional agricultural engineering thanks to the high-tech nature of the field.

Judging from interest among students at the University of Tennessee Institute of Agriculture at Knoxville, the land surveying field has a bright future. According to a professor who teaches land surveying skills as part of broader curricula there, the ongoing infusion of technology into the field is what currently generates so much interest--both in his case and as far as students are concerned.



Like many universities, UT Knoxville has expanded its agricultural engineering curriculum. Dr. Robert S. Freeland, PhD, PE, agricultural engineering professor in the Biosystems Engineering & Soil Science Department, says that the university changed the name of the Agricultural Engineering Department in 1998 to address student interest in broader biological studies curricula. The department, which is also part of the UT Institute of Agriculture, has four academic programs: biosystems engineering, soil science, environmental science and biosystems technology. Biosystems technology has four concentration areas: agricultural systems technology, construction technology, land surveying technology--Dr. Freeland's area--and off-road vehicle technology.



Ezra Glafenhein, a Biosystems Technology graduate student at UT Knoxville, deploys a multi-sided prism for use with a GTS 800A robotic total station. Also mounted on the pole are an RC-2 infrared device (at top), an FC-2500 data collector and a Satel radio that provides a communication link back to the total station. Photo by Robert Freeland

Freeland points out that students do "application surveying" in many courses, such as laying out farm ponds, erosion control structures and drainage control structures in agriculture. Developing an official land survey is entirely different but something in which an increasing number of students have become interested after they've received a taste of the skills involved. "As more and more people were taking surveying courses, they were asking about becoming a professional surveyor," he says. "So we added courses to our [Land Surveying Technology Concentration] and structured our coursework so that students take a certain set of courses and upon graduation are eligible to sit for the Tennessee Professional Land Surveyor-In-Training Exam."

More than one path to becoming a licensed surveyor exists within the Tennessee state university system. A four-year land surveying undergraduate degree is offered at East Tennessee State University. Students can also earn an undergraduate degree at UT Knoxville in environmental and soil sciences, or in a major outside of the department, such as forestry or civil engineering and take state pre-approved land surveying courses in biosystems technology.

Earning an undergraduate degree with a minor in biosystems technology takes four years but might allow some students to keep their future career options open to a greater extent than earning an undergraduate degree in land surveying. "What I'm finding out is that students do not want to change their major at the undergraduate level," Freeland says. "They want to stay in forestry, ornamental horticultural and landscape design or civil engineering. But they want the land surveying coursework to make them eligible to sit for the exam, although it falls under a minor in biosystems technology."

A third method of qualifying to sit for the state exam is also available through Tennessee's state university system--a graduate-level degree through UT Knoxville. "The big demand I'm finding is from people who already have an undergraduate degree," Freeland says. "They've finished school and they want to become land surveyors, but they don't want another undergraduate degree. In that case, they come to graduate school and they get a master's degree in biosystems technology and then take the courses that are needed to sit for the state exam."

Freeland contends that the high-tech equipment is driving interest in land surveying these days. "My personal opinion is that if it wasn't for the technology, you would not see this level of interest in land surveying," he says. "I definitely would not be interested in land surveying if it wasn't for the technology. The generation coming through here now is technology-savvy and when we're in the field surveying, we have lasers, we're communicating with satellites and we have a Wi-Fi hot spot. So it's very, very technology-oriented. All of the data are generated by computers and we plot the data out with computers. It's really attractive to people who like technology. I think the technology makes the work more interesting, more challenging, more professional--the work has more of a professional tone to it."

Ezra Glafenhein, a graduate student from Knoxville, earned his undergraduate degree in construction management from East Tennessee State in 2009. He subsequently worked for two contractors and got some exposure to architectural surveying and developing CAD drawings. Additionally, he learned about boundary surveying and locating structures on a construction site. "I found that was something I really liked," Glafenhein says.

Glafenhein is the grandson of an agricultural engineering professor at UT Knoxville who taught Freeland there years ago, and he decided that he wanted to become a licensed surveyor. However, "I wanted to go a route where I wouldn't have to go back to school for more than two or three years," he says. "I found out that I could get done at UT Knoxville in a year and a half."



Dr. Robert Freeland provides classroom instruction on surveying at the University of Tennessee at Knoxville. Seated (from left) are Dan Curry, Eric Miller, Ezra Glafenhein, Will Nichols, Chris Drinnon and Eugene Lackey. Photo by Ryan Bolcar.



Glafenhein records data on the FC-2500 data collector as the prism receives signals from the GTS 800A robotic total station. Also mounted on the pole are an RC-2 infrared device (at top) and a Satel radio that provides a communication link back to the total station. Photo by Robert Freeland

After taking the graduate record examination in spring 2010 and enrolling in the biosystems technology graduate program in mid-2010, Glafenhein has been exposed to several new areas of technology and skills. He has learned boundary law principles, created plat drawings using software and used GNSS receivers to locate structures on a site. By the summer of 2011, he expects to complete his studies and aspires to become a licensed surveyor and develop a career in land management. While pursuing his master's degree, Glafenhein has worked for a surveying firm, LandTech Surveying and Planning in Knoxville, where he hopes to become employed full-time after graduation.

The graduate school route also suits Jimmy Pierce of Nashville, who anticipates completing his master's degree studies at UT Knoxville this spring. Pierce completed a few surveying-oriented courses while pursuing his undergraduate degree in agricultural engineering technology at Technological University in Cookeville, Tenn.; however, he says that Tennessee Tech did not offer all of the state pre-approved courses necessary for Pierce to sit for the state licensing exam. Ultimately, Pierce says, he wants to work as a licensed land surveyor.

According to Pierce, the hands-on nature of land surveying instruction reinforces classroom learning. "I've always been a better hands-on learner," he says. "It's one thing when you sit in class and go through slides with people explaining and trying to figure out what it's all about. When you're out in the field and you're using the equipment, it all comes together."

The land-surveying studies at UT Knoxville give students plenty of exposure to the various surveying instruments and surveying software that they are likely to be exposed to in the real world.

The Biosystems Engineering and Soil Science Department has gained easier access to some equipment through Topcon Positioning Systems' Educational Partners Program. The program, which is normally implemented through Topcon's dealer network, provides financial support and training for educational institutions. More than 300 educational institutions in the United States are involved in the program. At UT Knoxville, Hayes Instrument Co., Shelbyville, Tenn., has provided equipment and training under the program for the past several years. Freeland reports that the department purchased a Topcon HiPer Lite+ base and rover real-time kinematic (RTK) GNSS unit through the program. The department also uses nine conventional total stations; a GTS 800A robotic total station and SATEL Radios; a network-capable Topcon Hiper-L1 RTK GNSS receiver; FC-100, FC-2500 and FC-25 data collectors; and five TDS Recon units equipped with TopSurv software.

Freeland, Glafenhein and Pierce say that learning different surveying software programs is one of the most valuable aspects of the land surveying curricula. They have used Topcon's TopSurv and Autodesk's AutoCAD program for field data collection and CAD drawings, respectively, as well as Topcon's SiteMaster for integrated design, surface modeling and construction surveying.

Pierce says he likes the flexibility of Topcon's software. TopSurv data can be exported into SiteMaster. AutoCAD can also interface with SiteMaster, which is equipped with surveying-specific tools that allow students to perform functions such as adding annotations to surveys. Students can also use SiteMaster to generate survey plats or 3D surface models for use in Topcon automated grade-control systems. "SiteMaster has different options where you can enter points manually or you can pull points in," Pierce says. "I just think it makes it a lot easier for surveyors and cuts back on a lot of headaches of trying to figure out how to get points in, how to draw text maps. Also, it measures boundaries for you."

Glafenhein, who has also used Carlson's Survey program while working for LandTech, recently gave a presentation on different surveying programs to local surveyors, including Carlson Survey, SiteMaster and Traverse PC. Because AutoCAD was the first program he worked on, he purchased his own student software license. "SiteMaster has a lot more icons," Glafenhein says. "It really depends a lot on what you learned first."

And learning is at the heart of the issue. As technology evolves and agricultural and other fields deal with increasingly complex data management challenges, Freeland believes the need for well educated, highly skilled surveyors will grow. UT Knoxville intends to nurture that growth by fostering the right environment.

Don Talend

Don Talend of Write Results Inc., West Dundee, IL, is a print and e-communications content developer specializing in covering technology and innovation. For more information about the land surveying technology concentration at UT Knoxville, visit <http://bioengr.ag.utk.edu/students/Survey.asp>. Additional details about Topcon equipment and software can be found at www.topconpositioning.com.



Freeland deploys a HiPer Lite+ base station before a class.
Photo courtesy of UTIA Communications

BLUE RIBBON AWARD



ASABE 2011 Educational Aids Blue Ribbon Awards Announcement

**Project Authors: Stephen Searcy, John Wanjura, Herb Willcutt,
Alan Brashears, Michael Buschermohle and Edward Barnes**

“Seed Cotton Handling and Storage”

The American Society of Agricultural and Biological Engineers (ASABE) ED-208 Extension Committee has finalized the judging of this year's competition and would like to announce that the project entry with the authors names listed above have been selected to receive a Blue Ribbon Award. Congratulations to all of the authors on this Blue Winning entry!

This competition encourages agricultural engineers in industry and public service (not limited to ASABE members) to strive for excellence in extension activities through the interchange of ideas on successful methods and techniques. It also promotes excellence in educational aids, which represent agricultural engineering and through the exchange of ideas and individual recognition, contributes to overall improvement in the use of educational aids.

Congratulations to the Following

Grant Awards for April 2011

Dr. Donald Tyler and Dr. Michael Essington

Funding Agency – USDA ARS

Amount - \$27,389.00

Dr. Xinhau Yin, Dr. Chris Main, Dr. Owen Gwathmey,

Dr. Michael Buschermohle and Dr. Donald Tyler

Funding Agency – Cotton, Inc.

Amount - \$21,423.00

Grant Awards for May 2011

Dr. David Buehler, Mr. David Smith, and Dr. Stacy Worley

Funding Agency – U.S. Army

Amount - \$300,969.00

Dr. Paul Ayers

Funding Agency – Mechanical Simulation Int'l, Inc.

Amount - \$167,574.00

Dr. Paul Ayers

Funding Agency – U.S. Army Corps

Amount - \$50,000.00

Grant Awards for May 2011, continued

*Dr. Michael Buschermohle, Dr. Robert Freeland, Dr. William
Hart, and*

Dr. Margarita Velandia

Funding Agency – Cotton, Inc.

Amount - \$15,000.00

Dr. Brian Leib and Dr. Christopher Main

Funding Agency – Cotton, Inc.

Amount - \$10,000.00

Dr. Shawn Hawkins

Funding Agency – Texas AgLife Extension Service

Amount - \$2,500.00

Student Travel Grant Available for San Antonio Meetings

The Association of Women Soil Scientists (AWSS) is sponsoring a program to provide funding for two undergraduate or graduate women to travel to the Soil Science Society of America Annual Meeting to present the results of her research. Grants of up to \$500 each may be used only for defraying the cost of registration, travel, and accommodations associated with the meeting.

AWSS is a 501(c)(6) nonprofit organization of **women and men** in soil science who support these goals:

1. To establish and maintain high standards for professional women soil scientists;
2. To promote and enhance communication among professional soil scientists;
3. To promote a dialogue of soil information and to encourage an interchange with other technical and scientific communities;
4. To promote better understanding of the role of soil scientists;
5. To provide assistance and encouragement for women in non-traditional fields and for women seeking employment in the field of soil science.

AWSS is a member of the United States Consortium of Soil Science Associations (USCOSA).

Please see the application guidelines for more information at www.awss.org.

Please submit all application materials to:

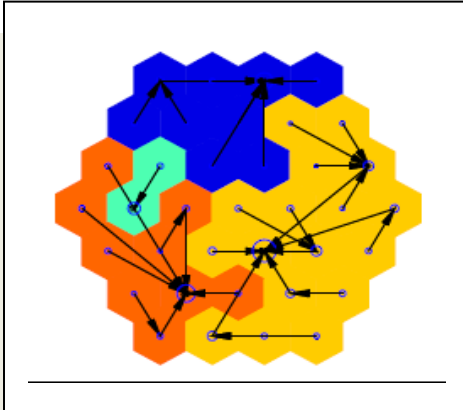
Dr. Suduan Gao, Award Committee Chair
USDA-ARS, Water Management Research
9611 S. Riverbend Ave.
Parlier, CA 93648
Fax: 559-596-2851
Email: Suduan.Gao@ars.usda.gov

Applications are due 15 August 2011





NIMBioS-NESCent Investigative Workshop: Modeling social complexity



Topic: Towards a formal theory for the evolution of human social complexity

Meeting dates: February 6-8, 2012

Organizers: [Peter Turchin](#), Dept. of Ecology and Evolutionary Biology, University of Connecticut, Storrs

[Laura Fortunato](#), Santa Fe Institute, Santa Fe, NM

[Sergey Gavrilets](#), Dept. of Ecology and Evolutionary Biology, Dept. of Mathematics, Univ. of Tennessee, Knoxville

[Participants](#) (preliminary)

Objectives: The aim of this workshop, jointly sponsored by NIMBioS and [NESCent](#), is to bring together a diverse group of modelers with anthropologists, archaeologists, and other social scientists to (i) synthesize the state of knowledge in formal models of the evolution of social complexity, (ii) identify unresolved issues, and (iii) set an agenda for future collaborative work. The workshop will be organized around the following general themes: What theories and data are available? What are the empirical patterns that cannot be explained by the existing theories and data? How can we adapt existing models to make full use of the available data? What kinds of data are needed to better inform the models? What new modeling techniques and methods need to be developed?

The great majority of humans today live in complex societies, which can exist only on a basis of extensive cooperation among large numbers of individuals. Ultrasociality, the ability of humans to cooperate in large groups of genetically unrelated individuals, presents a puzzle to both evolutionary and social theory. Its emergence likely involved the evolution of cooperation in small groups, characterized by an egalitarian social structure, followed by a reversal of this trend starting around 5–10 kya, with the rise of the first non-egalitarian complex societies. Theories to explain how complex societies evolved span the biological, social, and historical sciences, but they largely rely on verbal reasoning: until recently, formal models have focused on the evolution of cooperation in small groups, while the transition from small- to large-scale societies has been mostly neglected.

We aim to achieve a true dialogue between modelers and empiricists. Fortunately, comparative data are readily available in the anthropological literature to inform the model-building process and for empirical testing of model predictions. In modeling the transition from small- to large-scale societies, and the concomitant development of hierarchical social organization, these data can be used to extract clusters of factors that co-vary with degree of political integration, and which may therefore have

driven this transition. The processes inferred from the synchronic data in cross-cultural samples can then be tested against the diachronic data in archaeological databases. Additionally, complete sequences of archaeological data for selected world regions can be used to investigate the extent to which the patterns and processes inferred from these worldwide samples generalize through time and space. The future development of this field need not be limited to existing databases: one of the workshop goals is to motivate archaeologists and anthropologists to develop additional regional sequences.

One of the immediate goals of the workshop will be publication of a special issue in a professional journal to be determined, which will include several reviews written by workshop participants. It is likely that a number of new research collaborations will be established at the workshop; additionally, we hope to identify an area at the interface of modeling and data analysis that would be most promising to tackle within a NIMBioS Working Group.

[Descriptive Flyer](#)

Application deadline: September 30, 2011 Oklahoma State University currently has two positions open.

[Click here](#) to apply.

Participation is limited; those selected to attend will be notified within two weeks of the application deadline.

[NIMBioS Investigative Workshops](#) involve 30-40 participants, focus on a broad topic or a set of related topics, attempt to summarize/synthesize the state of the art and identify future directions, and have potential for leading to one or more future Working Groups. Individuals with a strong interest in the topic, including post-docs and graduate students, are encouraged to apply. If needed, NIMBioS can provide support (travel, meals, lodging) for Workshop attendees



OKLAHOMA STATE UNIVERSITY

The Division of Agricultural Sciences and Natural Resources at **OSU** currently has two positions open:

Oklahoma State University is seeking a Program Support Leader — Institute for Agricultural Biosciences, Ardmore, OK.

Non-tenure track faculty position with responsibilities for coordinating field research and education efforts for the Oklahoma State University Institute for Agricultural Biosciences. Ph.D. in agriculture related discipline with significant research and/or management experience is required. Letter of interest with three references and resume to be submitted to Dr. J. Edelson, 139 Ag. Hall, OSU, Stillwater, OK, 74074. Application reviews to begin July 5, 2011. Email: jonathan.edelson@okstate.edu. Full announcement at: <http://hr.dasnr.okstate.edu/vacant-positions/administrative-faculty-vacancies>

Oklahoma State University is seeking a Unit Leader-Senior Director for the Field & Research Service Unit — Oklahoma Agricultural Experiment Station.

Non-tenure track faculty position with responsibilities for managing and supervising the Unit with 19 field stations and 65 employees that support research and education efforts throughout the State. The position is to be located on campus, Stillwater, OK. Ph.D. in agriculture related discipline with significant research and/or management experience is required. Letter of interest with three references and resume to be submitted to Dr. K. Owens, 011 Ag. Hall, OSU, Stillwater, OK, 74074. Application reviews to begin July 15, 2011. Email: keith.owens@okstate.edu. Full announcement at: <http://hr.dasnr.okstate.edu/vacant-positions/administrative-faculty-vacancies>



United States Department of Agriculture

National Institute of Food and Agriculture

The NIFA National Integrated Water Quality Program Request for Applications is now published. Proposals are due on July 15, 2011, at 5:00 ET. The FY2011 highlights are:

- 1) Tools and technologies for consumers to understand the water/environmental impact of food production and consumption;
- 2) Water management in the agricultural value chain (including connections to food processing, aquaculture, and specialty crops;
- 3) Water management technology for handheld devices (Smartphones and tablets);
- 4) A partnership with the Farm Service Agency that addresses nitrogen management in agriculture; and
- 5) A youth-water-education project aimed at building awareness and engagement for youth that goes beyond just the hydrologic cycle.

For more information go to: <http://www.nifa.usda.gov/fo/waterqualityicgp.cfm>

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EAR Postdoctoral Fellowships (EAR-PF)

Full Proposal Deadline Date: July 1, 2011

Program Guidelines: NSF 10-500

The Division of Earth Sciences (EAR) awards Postdoctoral Fellowships to highly qualified investigators within 3 years of obtaining their PhD to carry out an integrated program of independent research and education. The research and education plans of each fellowship must address scientific questions within the scope of EAR disciplines. The program supports researchers for a period of up to 2 years with fellowships that can be taken to the institution or national facility of their choice.

More at: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503144&WT.mc_id=USNSF_39&WT.mc_ev=click

Water Sustainability and Climate (WSC)

One of the most pressing problems of the millennium is water sustainability -- how it is likely to affect our world, and how we can proactively plan for its consequences. This activity allows the partner agencies--National Science Foundation (NSF) and the United States Department of Agriculture National Institute of Food and Agriculture (USDA/NIFA) -to combine resources to identify and fund the most meritorious and highest-impact projects that support their respective missions, while eliminating duplication of effort and fostering collaboration between agencies and the investigators they support.

Program Solicitation

NSF 11-551

Replaces Document(s):

NSF 10-524



National Science Foundation

Directorate for Geosciences

Directorate for Engineering

Directorate for Social, Behavioral & Economic Sciences



National Institute of Food and Agriculture

Synopsis of Program:

One of the most urgent challenges facing the world today is ensuring an adequate supply and quality of water in light of both burgeoning human needs and climate variability and change. Despite water's importance to life on Earth, there are major gaps

in our basic understanding of water availability, quality and dynamics, and the impact of both a changing and variable climate, and human activity, on the water system. The goal of the Water Sustainability and Climate (WSC) solicitation is to understand and predict the interactions between the water system and climate change, land use (including agriculture, managed forest and rangeland systems), the built environment, and ecosystem function and services through place-based research and integrative models. Studies of the water system using models and/or observations at specific sites singly or in combination that allow for spatial and temporal extrapolation to other regions, as well as integration across the different processes in that system are encouraged, especially to the extent that they advance the development of theoretical frameworks and predictive understanding.

Specific topics of interest include:

- Developing theoretical frameworks and models that incorporate the linkages and feedbacks among atmospheric, terrestrial, aquatic, oceanic, and social processes that can be used to predict the potential impact of (1) climate variability and change, (2) land use and (3) human activity on water systems on decadal to centennial scales in order to provide a basis for adaptive management of water resources.
- Determining the inputs, outputs, and potential changes in water budgets and water quality in response to (1) climate variability and change, (2) land use and (3) human activity, and the effect of these changes on Biogeochemical cycles, water quality, long-term chemical transport and transformation, terrestrial, aquatic and coastal ecosystems, landscape evolution and human settlements and behavior.
- Determining how our built water systems and our governance systems can be made more reliable, resilient and sustainable to meet diverse and often conflicting needs, such as minimizing consumption of water for energy generation, industrial and agricultural/forest rangeland production and built environment requirements, reuse for both potable and non-potable needs, ecosystem protection, and flood control and storm water management.

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time): October 19, 2011

Available Formats:

HTML: http://www.nsf.gov/pubs/2011/nsf11551/nsf11551.htm?WT.mc_id=USNSF_25&WT.mc_ev=click



Several new NSF opportunities:

<http://www.nsf.gov/div/index.jsp?org=MCB>

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501087&WT.mc_id=USNSF_39&WT.mc_ev=click

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13544&WT.mc_id=USNSF_39&WT.mc_ev=click

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501090&WT.mc_id=USNSF_39&WT.mc_ev=click

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501089&WT.mc_id=USNSF_39&WT.mc_ev=click

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501086&WT.mc_id=USNSF_39&WT.mc_ev=click

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5444&WT.mc_id=USNSF_39&WT.mc_ev=click



Engineering Research Centers (ERC)

PROGRAM GUIDELINES

Solicitation [11-537](#)

DUE DATES

Letter of Intent Deadline Date: July 15, 2011

Full Proposal Deadline Date: September 16, 2011

LOIs and full proposals must be submitted by 5:00 p.m. proposer's local time on the relevant deadline or the proposal will be returned without review.

SYNOPSIS

The National Nanotechnology Initiative (NNI), a federal interagency research and development venture, was launched in FY 2001. Over the last decade, there has been considerable investment in fundamental research - from nanostructured materials to devices and manufacturing processes - that has revealed new phenomena and resulted in a plethora of important advances. At NSF the funding vehicles included individual grants (unsolicited and Nanoscale Exploratory Research - NERs), small teams (Nanoscale Interdisciplinary Research Teams - NIRTs), user networks such as National Nanotechnology Infrastructure Network (NNIN) and the Network for Computational Nanotechnology (NCN), and centers (Nanoscale Science and Engineering Centers - NSECs). In addition, there were other NSF programs that supported research and education activities in nanotechnology. More information can be found at: <http://www.nsf.gov/nano/>.

At this time, some discoveries are at the phase to explore their integration into nanosystems, thus leading to adoption in applications critical for their commercial use. To enable this integration, the Engineering Research Centers (ERC) program is launching this new competition targeting the Transformational Nanotechnology of Engineered Systems Centers or NanoSystems ERCs (NERCs). These new centers will adopt and follow all the features of Generation-3 (Gen-3) ERCs.

The goal of the Generation Three (Gen-3) Engineering Research Centers (ERC) Program is to create a culture in engineering research and education that links discovery to technological innovation through transformational fundamental and engineered systems research in order to advance technology and produce engineering graduates who will be creative U.S. innovators in a globally competitive economy. These ERCs will be at the forefront as the U.S. competes in the 21st century global economy where R&D resources and engineering talent are internationally distributed. Recognizing that optimizing efficiency and product quality are no longer sufficient for U.S. industry to remain competitive, these ERCs will optimize academic engineering research and education to stimulate increased U.S. innovation in a global context. They will develop this culture that joins discovery and innovation, i.e., an innovation ecosystem. An innovation ecosystem includes the people, institutions, policies, and resources that promote the translation of new ideas into products and processes and services. The innovation ecosystem of Gen-3 ERCs is achieved through a symbiotic relationship between the ERC's researchers, small businesses, larger industrial and practitioner partners, and partner organizations devoted to stimulating entrepreneurship and innovation. In essence this solicitation requires that the efforts be devoted to creating, developing, and enhancing capacities in ERCs from transformational fundamental research to technology commercialization and creating a continuous pipeline in engineering education from middle school to graduate studies.

In order to achieve this, Gen-3 ERCs will:

1. Advance discovery and build bridges from science-based discovery to technological innovation to realize transformational engineered systems;
2. Develop a culture in academe that joins research, education, and innovation to create and sustain an innovation ecosystem to enable the ERC's vision;
3. Provide international opportunities for research and education collaboration that will prepare U.S. engineering graduates for leadership in innovation in a global economy;
4. Form teams of diverse and talented faculty who will prepare diverse and talented domestic and international graduates to function effectively in a global world where research, design and production efforts across national borders;
5. Function with transformational engineering education programs that rest on partnerships with pre-college institutions to attract students to engineering and university departments to strategically impart in engineering graduates the capacity to create and exploit knowledge for technological innovation; and
6. Build and sustain a culture that links discovery to innovation, the ERC innovation ecosystem, which will include partnerships with members firms/practitioners to strengthen the ERC and streamline technology transfer; translational research partnerships with small firms to accelerate commercialization of high risk ERC advancements; and innovation partnerships with local level organizations to stimulate entrepreneurship and job creation and enable technological innovation.

THIS PROGRAM IS PART OF

[Engineering Research Centers](#)

Writing Good Multiple-Choice Items

TOMORROW'S PROFESSOR(sm) eMAIL NEWSLETTER

<http://cgi.stanford.edu/~dept-ctl/cgi-bin/tomprof/postings.php>

From Chapter 11, Writing a Traditional Test in the book, *Assessing Student Learning: A Common Sense Guide* by Linda Suskie. Published by Jossey-Bass, A Wiley Imprint 989 Market Street, San Francisco, CA 94103-1741

As with any other assessment, multiple-choice tests should yield fair and truthful information on what students have learned (Chapter Three). There are just two basic precepts to writing fair and truthful multiple-choice items.

- Remove all the barriers that will keep a knowledgeable student from answering the item correctly. Students who have truly learned the concept or skill that a particular item tests should choose the correct answer.
- Remove all clues that will help a less-than-knowledgeable student answer the item correctly. Students who truly haven't learned the concept or skill that a particular item tests should answer the item incorrectly.

The suggestions in Table 11.1 follow these two precepts. Exhibit 11.2 gives some examples of multiple-choice items that follow most of these suggestions and assess thinking skills as well as conceptual understanding.

Writing good multiple-choice items can be difficult. Test publishers write, try out, and discard many, many items for each one that ends up in a published test. Even the examples in Exhibit 11.2 don't completely follow the suggestions in Table 11.1. So don't expect to be able to follow all these suggestions all the time, and don't expect your test questions to work perfectly the first time you use them. Analyze the results (Chapter Sixteen), revise the test accordingly, and within just a few cycles you will have a truly good test.

Table 11.1 Tips for Writing Good Multiple-Choice Questions

General Tips

Keep each item as concise as possible. Short, straightforward items are usually easier to understand than complex statements. Avoid irrelevant material, digressions, and qualifying information unless you are specifically assessing the skill of identifying needed information. Don't repeat the same words over and over in the options; put them in the stem.

Define all terms carefully. If you ask, "Which of the following birds is largest?" make clear whether you mean largest in terms of wingspan or weight. What do you mean by "sometimes," "usually" or "regularly"?

Don't make the vocabulary unnecessarily difficult. Except for terms you are specifically assessing, keep the vocabulary simple—perhaps high school level. Otherwise you may unfairly penalize students who know the material but don't have a strong general vocabulary.

Watch out for "interlocking" items: items in which a student can discern the answer to one question from the content of another. Review carefully all items that share similar options. In a similar vein, don't ask students to use their answer to one question to answer another. If they get the first question wrong, they will automatically get the other question wrong as well, even if they understand the concept tested in the second question.

Writing a Good Stem

The Stem should ask a complete question. The student shouldn't have to read the options to discern the question. To check this, ask yourself if students would be able to answer the question posed in the stem correctly if no options were provided.

Avoid "Which of the following" items. They require students to read every option and can penalize slow readers in a timed-testing situation.

Don't ask questions that can be answered from common knowledge. Someone who hasn't studied the material shouldn't be able to answer the questions correctly.

Avoid negative items. In a stressful testing situation, students can miss the word not or no. If you must have negative items, underline, capitalize, or boldface words like NOT or EXCEPT.

Avoid grammatical clues to the correct answer. Test-wise students know that grammatically incorrect options are wrong. Use expressions like "a/an," "is/are," or "cause(s)."

Writing Good Options

You needn't have the same number of options for every question. Four options are fine. A good fifth option is often hard to come up with, takes extra reading time, and reduces the chances of guessing the correct answer only from 25 to 20 percent. Some questions may have only three plausible options (for example, "Increases," "Decreases," and "Remains unchanged").

Order responses logically. Order responses numerically if they are numbers and alphabetically if they are single words. This helps students who know the answer find it quickly. If the options have no intuitive order, insert the correct answer into the responses randomly.

Line up responses vertically rather than horizontally. It's much easier—and less confusing—to scan down a column than across a line to find the correct answer. If you are using a paper test and your options are so short that this seems to waste paper, arrange the test in two columns.

Make all options roughly the same length. Test-wise students know that the longest option is often the properly qualified, correct one. (For this reason, a relatively long option can make a good distracter!)

Avoid repeating words between the stem and the correct response. Test-wise students will pick up this clue. (On the other hand, verbal associations between the stem and a distracter can create an effective distracter.)

Avoid using "None of the above." A student may correctly recognize wrong answers without knowing the right answer. Use this option only when it is important that the student know what not to do. If you use "none of these," use it in more than one question, both as a correct answer and an incorrect answer.

Avoid using "All of the above." This option requires students to read every option, penalizing those in a timed testing situation who know the material but are slow readers. Students who recognize option A as correct and choose it without reading further are also penalized. "All of the above" also gives full credit for incomplete understanding; some students may recognize options A and B as correct and therefore correctly choose "All of the above" even though they don't recognize option C as correct.

Writing Good Distracters

The best distracters help diagnose where each student went wrong in his or her thinking. Identify each mental task that students need to do to answer a question correctly, and create a distracter for the answer students would arrive at if they completed each step incorrectly.

Use intrinsically true or at least plausible statements. Test-wise students recognize ridiculous statements as wrong. To see if your test has such statements, ask a friend who has never studied the subject to take the test. His or her score should be roughly what would be earned from guessing randomly on every item (25 percent for a four-option multiple-choice test).

Exhibit 11.2. Multiple-Choice Questions on Assessment Concepts

Correct answers are in italics [with an *].

1. Which statement refers to measurement as opposed to evaluation?
A.* Emily got 90 percent correct on the math test.
B. Lin's test scores have increased satisfactorily this year.
C. Justin's score of 20 on this test indicates that his study habits are ineffective.
D. Keesha got straight A's in her history courses this year.

2. Alyssa took a test on Tuesday after a big fight with her parents Monday night. She scored a 72. Her professor let her retake the same test on Thursday when things cooled off. She scored 75. The difference in her scores may be attributed to:
A. chance or luck.
B. lack of discrimination.
C. lack of validity.
D.* measurement error.

3. People who score high on the Meyers Musical Aptitude Scale usually score low on the Briggs Biologists Aptitude Test. People who score low on the Meyers usually score high on the Briggs. Which of the figures below most likely represents the correlation between the two tests?
A. .80
B. .00
C. -.10
D.* -.60

4. Choose the most likely correct answer to this nonsense question, based on what you know about informed guessing on tests. A drabble will coagulate under what circumstances?
A. Only when pics increase
B. Only when pics change color
C. By drawing itself into a circle
D.* Usually when pics increase, but occasionally when pics decrease

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TO: FACULTY, SUPPORT STAFF,
PROFESSIONAL STAFF, & STUDENTS

UTIA to Host
The USDA NIFA Webinar
Competitive Grants Program

When: Tuesday, August 9, 2011 in the
Plant Biotech Building,
Room 156-157.

The webinar will begin around 8 or 9am
And
Conclude around 4 or 5pm

(Time details to follow later)

Lunch will be provided

Obituaries

Denver Olen Baxter

Mr. Denver Olen Baxter, 83, of Crandall, passed away Monday, Nov. 24, 2008. Olen graduated Murray County High School Class of 1943. He served in the Army Air Corps during World War II as a gunnery sergeant. He was a gunnery instructor in the B-17 Flying Fortress, teaching waist gunners (the six B-17 gun positions are nose gun, top turret, ball turret, right and left waist guns, and tail guns). He graduated from the University of Georgia Class of 1950 with a BS in agricultural engineering, and a master degree from the University of Missouri. He was inducted into the Murray County High School Alumni Hall of Fame. Mr. Baxter was a member of our faculty from approximately 1956 to 2004, teaching and doing research in the structures area (<http://bioengr.ag.utk.edu/alumni/history.asp>). He also served as the Agricultural Experiment Station Engineer for some time during that period, although unofficially, the same way that Dr. George Grandle did in the days before there was an Experiment Station Engineer position. His last research project was the earth tube heat exchanger for dairy livestock cooling, and the soil temperatures and energy exchanges associated with that system. He was preceded by his parents, Mr. and Mrs. D.O. Baxter; sisters, Lorene Baxter Headrick and Mildred Baxter Petty; and a brother, George H. Baxter. Mr. Baxter spent his last years at the family farm in Crandall, GA (about 9 miles south of the GA-TN state line along US Hwy 411) with his aging sisters. Survivors include his sisters, Will Dee Baxter and Stella Baxter of Crandall, GA; brother, Arthur Baxter of Crandall; 12 nieces and nephews; brother-in-law; sister-in-law; and special caregivers, Greg and Diane Ball. Services were held at 4 p.m. in the chapel of Peebles Funeral Home with the Rev. Dale Watson officiating. Burial was in Sumach Cemetery.

Excerpts added from The Daily Citizen, Dalton, GA

Cora McCann

MCCANN, CORA - 83 of Wartburg, a faithful Christian, passed away Thursday, April 21, 2011 at the Life Care Center of Morgan County. Retired from the Agricultural Engineering Department of the University of Tennessee, she was the daughter of the late Ed and Myrtle Newberry McCann of Wartburg. She was deeply loved and will be sorely missed by survivors: sister, Christine Vespie, Wartburg; nephews: Randall and Kim Vespie, who lovingly cared for Cora in her later years, Ken and Gail Vespie of Oak Ridge, Wayne and Kay Vespie of Hanson, Kentucky, Stan Vespie of Linden, Tennessee; niece, Joan and Edd Diden of Wartburg; beloved great-nephews, Phil, Matthew, Tim, David, Paul, Jonathan and Adam Vespie and BJ Diden; great-nieces: Kathy Ketner, Emily Gibson, Julie Shelton, Katie Vespie, and Miriam Allman; several great-great nieces and nephews including Jacob Mynatt of Knoxville. Graveside services will be held Saturday April 23, 2011 at the Wartburg Cemetery at 2:00 p.m. with nephew, Dr. Stan Vespie, officiating. The family received friends from 1 to 2 p.m. at Schubert's Funeral Home prior to the graveside service. In lieu of flowers, memorial gifts may be given to Tom's Creek Baptist Church in Linden, Tennessee. Schubert Funeral Home of Wartburg in charge of the arrangements.

www.schubertfuneralhome.com

Cora McCann worked for the department from 9/14/55 to 12/30/93

Obituaries

Curtis Hamilton Shelton

SHELTON, CURTIS HAMILTON - age 86 of Knoxville, passed from this life to the next on April 20, 2011. He joins his wife Kathryn and older son Jack, parents John and Eva, and brother Harper. Curtis was tender and tough, quick-witted and kind, a gentleman and a gentle man. Curtis lived a quiet life of hard work, simple pleasures, service to others, and devotion to God and country, family and friends. He was born in 1924 in Mecklenburg County, Virginia. Despite losing his own father to sudden illness as a young boy during the Great Depression, Curtis helped his mother Eva (a 1-room school teacher) and brothers William and Harper keep the small family farm together and grew to be an exemplary husband and father. He was Kathryn's primary caregiver through her long illness and spent many years searching with her for their missing son Jack before discovering he had been murdered in Guatemala in 1981. Curtis decided not to exhume Jack's body from a mass grave for burial at home because of the anguish the disturbance would have caused the other families, and instead with Kathryn built a memorial in Solola for Jack and the other victims. A proud Marine, Curtis served in the Pacific in WWII on Iwo Jima, Saipan, and Okinawa. After the war he earned degrees in Agricultural Engineering at Virginia Tech, where he met Blacksburg native Kathryn Reynolds while dancing to the song Peg O' My Heart. They were the love of each other's lives for over 50 years. Kathryn passed in 2008. Also at VA Tech, Curtis excelled in running cross country. Curtis once asked a close competitor if he'd like to finish in a tie, and when the other man said no, only then did Curtis pull away and win the race. Curtis and Kathryn taught high school in Marion, Virginia before moving to Cookeville, TN for Curtis to teach at Tennessee Tech. He soon began a career of over 30 years at UT Knoxville in Ag Engineering, now Biosystems Engineering and Soil Science. Curtis taught soil and water conservation engineering, forest surveying, and Ag machine shop (working with wood, metal, and concrete). He was internationally recognized for his pioneering research and extension work demonstrating how no-till farming reduces soil loss and water pollution, especially with his rainfall simulator at the Milan Field Station in West Tennessee. Curtis was known for high standards and working hard. His guidance of several graduate students led him to help with conservation work in Nepal. Also while at UT, Curtis was active as a Scout leader and joined other volunteers in searching for Dennis Martin, the little boy who disappeared in the Smokies in 1969. He did the surveying for land grading and drainage necessary for creation of the UT Gardens on Neyland Drive, which he later enjoyed visiting with niece Rosemary Green and husband Ron Heath, and designed the soil and water and shop labs for the new Ag Engineering building. Curtis loved gardening and travelling with Kathryn, and making presents for her, old time music with family and friends, the Murphy Builders Sunday School Class and serving on the Properties Committee at Church Street United Methodist Church, and hand-carving hundreds of adorable, lifelike, smiling wooden reindeer that he guaranteed would not eat your garden, which he and Kathryn enjoyed selling with her hand-tied bows at the UT Arts and Crafts Fair at Christmastime. Even with dementia, Curtis was concerned for the welfare of others. With family friend Melinda Foster he enjoyed playing harmonica for folks at Brakebill Nursing Home and Kay Senior Center at Church Street. Especially the old gospel hymns like How Great Thou Art, What a Friend We Have In Jesus, and Sweet Hour of Prayer. With younger son Barry he enjoyed running in the Buddy's Race Against Cancer and other 5K races to raise money to help people, often winning his age group, and playing harmonica for fellow residents at Homewood. Curtis is survived by brother: William Shelton, and wife Bird Shelton and family of Boydton, VA; sister-in-law: Elvira Shelton and family of Rocky Mt, NC; son: Barry Shelton and family friend Melinda Foster of Knoxville, TN;

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Obituaries

Hugh Oswell (Ozzie) Vaigneur

VAIGNEUR, HUGH OSWELL (OZZIE) - age 82, of Knoxville, formerly of Jackson, Tennessee, passed away at home on Monday, April 25, 2011. He was born September 6, 1928, in Ridgeland, South Carolina to the late Hugh Lee Vaigneur and Sarah Malphrus Vaigneur. Ozzie was a member of Cedar Springs Presbyterian Church, Knoxville, and a former member of Woodland Baptist Church in Jackson, Tennessee, where he served as a deacon for many years. Although Ozzie's accomplishments were many, his life was best characterized by a sacrificial love for his family, a humble service to those around him, and a gentleness of spirit that brought joy to those whose lives he touched. The eldest of ten children, Ozzie grew up in a farming family. He came to know and love the Lord as a child and to understand the importance of sharing that love through service to others. He was active in his church and 4-H Club, and he served in the U.S. Army. His interest in agriculture led him to earn his bachelors and his master's degrees from Clemson University and his PhD from Iowa State University, all in agricultural engineering. His 23 years of service with the University of Tennessee included teaching and administration on the UT Knoxville Agricultural Campus and working tirelessly as a specialist with the UT Agricultural Extension Service in Jackson.. He was a member of Gideon's International, a ministry very dear to him. An avid hobby farmer, Ozzie's joy was growing the fruits and vegetables that he shared with a multitude of friends. His family-especially his grandchildren-- will always fondly remember riding in the trailer behind his tractor as he drove them to the cornfield and the blueberry bushes. He had a great influence on many lives and will be dearly missed. Left to cherish his memory are his loving wife of 53 years, Martha Cagle Vaigneur, son and daughter-in-law, Keith and Susan Leppard Vaigneur, daughter and son-in-law, Annette and Brian Adler; grandchildren Sarah Adler, Noah Adler, Haley Vaigneur, Benjamin Vaigneur, David Vaigneur, and Lydia Vaigneur; brothers and sisters-in-law, Byron and Margaret Vaigneur, Truett Vaigneur, Jerry and Melinda Vaigneur; sisters and brothers-in-law, Mary Daley, Sarah Sanders, Patricia and Rodney Malphrus, Katherine and Ellree Keiffer, Ada and Mac McDowell, Alice and Gary Way; a host of extended family, and many friends. Ozzie will be taken Wednesday to Sauls Funeral Home, 310 W. Adams, Ridgeland, South Carolina where the family will receive friends 2:00-3:00 p.m. Friday at Great Swamp Baptist Church, his boyhood church that was dear to his heart, followed by a funeral service at 3:00 p.m. with Rev. Ralf Lee officiating. Interment will follow in the church cemetery. Local arrangements provided by Rose Mortuary Mann Heritage Chapel. Online condolences may be made at www.rosemortuary.com.

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