

## COLLEGE OF TEXTILES ANNUAL REPORT 2005-2006

### ***Changes in Service Environment***

In the past six months we have undertaken a major assessment of the college and the many opportunities facing the college. Our intent is to understand the significance of these opportunities, our capability to seize these opportunities, and the existing leadership in the college. Our Assessment Steering Committee is almost entirely external, co-chaired by former Dean Robert Barnhardt and NC Textile Foundation Board Chairman Dale Hayes, and contains many outstanding leaders from diverse industries and a leading international textile school. With the sponsorship of the North Carolina Department of Commerce, we have completed an extensive study of the textile industry in North Carolina identifying over 1400 companies employing over 120,000 people. The textile industry is showing signs of new strength in several sectors. Even many of the traditional companies are competing well in world markets. Our short courses and in-plant courses continue to grow. We have attracted new members to the Nonwovens Cooperative Research Center (NCRC) with membership now over 70 companies making it by far the largest Industry-University Research Cooperative in the U.S. Many textile companies have renewed interests in research and new product development. We are working with more companies in more ways than ever before. A million dollar Federal Grant for a Man in Simulant Test Lab will give NC State a unique capability in a critical area of support for U.S. first responders and military.

The industry continues to expand into new, nontraditional, areas. Our primary challenge is to set priorities carefully and move quickly to be the leader in selected areas to attract the necessary funding, build the facilities, and position our faculty and students for these emerging opportunities.

### ***Compact Plan: Major Initiatives from Our Compact***

We entered into a new partnership with a leading company for a three-year, \$632,000 project to develop a new high-performance fiber to be used in protective fabrics. One of our newest initiatives is providing leadership for the creation of the Advanced Vehicle Research

Center. Last fall we held our first conference in fuel cells and this spring we held an open research conference attracting over 80 researchers in automotive areas.

One of our major initiatives continues to be increasing visibility of the college through public relations and improved communications. This past year we had 87 articles placed in university, local, state, national, and international publications, including *The News and Observer*, *Science Daily*, *The New York Times*, *Wall Street Journal*, *US Airways Magazine*, *Triangle Business Journal*, *The China Post*, and *Showtime Magazine*. We were on six television spots including four appearances on *Jeopardy*. The foreign press covered research in the college with articles in France, the U.K., India, Japan, China, Ethiopia, Germany, and Italy.

### ***Diversity: Initiatives and Progress***

The College of Textiles continues to be a leader in diversity and was recognized again this year for its leadership in attracting minority freshmen. Our undergraduate class is 10% African American, 6% Asian, and 2% international. We would like to increase international undergraduate enrollment to 5%. Our graduate enrollment is 45% international. The African American Textile Society has become a strong organization. The AATS Fashion Show this spring was a smashing success with a large crowd, three renowned judges, and incredible originality in the creations. The College remains one of the most diverse on campus in faculty and in students. Our new hires in faculty and staff demonstrate our commitment to diversity. Our new faculty are a female chemist and an Asian chemical engineer, our seven new EPA hires include three females and a Native American, and our four SPA hires include an Asian-American and a Hispanic-American.

### ***Instructional Program Advances***

In our goal to enhance our Polymer and Color Chemistry Program, Professor David Hinks continued his development of a focus in forensics. A capstone senior course for chemistry students has also been added. After our successful ABET visit, our faculty in the Textile Engineering Program have concentrated efforts on a major revision of their curriculum. Our faculty in Textile and Apparel, Technology and Management have implemented three new concentrations

for our B.S. in Textiles and Apparel Management: brand management and marketing, fashion development and product management, and textile supply chain management. We have just started planning a joint program with ENSAIT in France and Hong Kong Polytechnic University to launch in September 2007 for an M.S. in Textiles, Global Supply Chain Management, degree where students spend one semester each in Asia, Europe, and the United States. A major focus for the college in the coming months is to address textile design in the widest understanding ranging from designing new medical, geotextile, transportation, industrial and other textile products to the fashion side including household, apparel, accessories and other products.

The Graduate Certificate in Nonwoven Science and Technology has proven to be successful with 6 students having received this additional qualification. Our Distance Education courses are gaining in popularity but much of this is due to on campus student registrations. The growth is due to the fact that it is easier for students to schedule required classes and counteract some scheduling problems where required classes are taught at the same time.

### ***Research***

As seen in Table 1 for total funding received (proposals awarded) in 05-06, the College moved above the \$6M mark, a 23% increase over the previous year. This improvement is due largely to strong support for the Nonwovens Cooperative Research Center, which received nearly \$2.6M in funding through the first week of June 2006. Also evident from the awards received is the \$400K improvement in non-National Textile Center federal funding over last year. This has been and will continue to be a point of emphasis for the College, by increasing the number of grant proposals developed and submitted in this important arena.

Our *Textile Protection and Comfort Center* continues to enhance its reputation as the finest facility in the world for assessing protection and comfort issues. The Center received an additional \$225,000 for new work on the first responder's ensemble and has just received a new Federal Grant of \$1,000,000 to develop the Man In Simulant Test Lab to support our emergency response workers and military forces.

Table 1. Five-year summary of research funding activity.

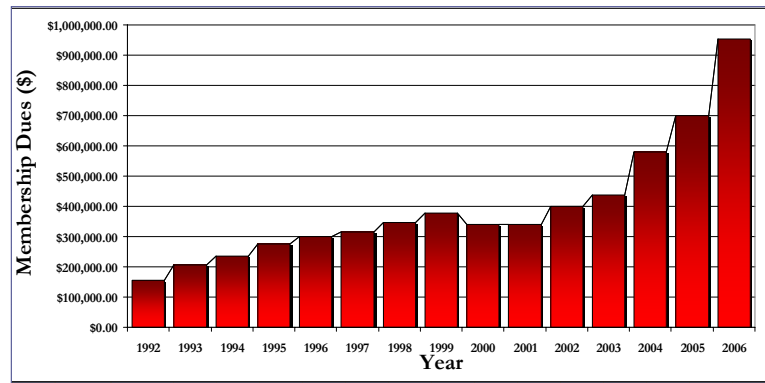
	2001-02	2002-03	2003-04	2004-05*	2005-06
Proposals Awarded	3,786,323	4,319,768	4,049,266	5,380,662	6,653,758
	44	43	42	63	77
<b>Federal (non-NTC)</b>	<b>64,782</b>	<b>724,613</b>	<b>956,101</b>	<b>476,385</b>	<b>877,457</b>
	2	5	4	4	8
<b>NTC</b>	<b>2,358,140</b>	<b>2,363,309</b>	<b>2,089,811</b>	<b>2,066,198</b>	<b>2,064,052</b>
	16	19	13	12	13
<b>Industry</b>	<b>1,363,401</b>	<b>1,231,846</b>	<b>1,003,354</b>	<b>3,268,996</b>	<b>3,712,249</b>
	26	19	25	53	48

The National Textile Center, a partnership of the eight leading textile schools, continues to be successful, with this past year marking the 14<sup>th</sup> year of support from Congress and a 30% increase in funding. This center continues to be one of the few sources of funding for new fundamental knowledge for the textile industry, supporting basic research in new materials, new chemical processes, new manufacturing processes, and new systems.

Our new partnership with ITT and the creation of the ITT/NCSU Research Consortium continues to bring significant new research opportunities to the college and supports twenty outstanding graduate students. The Institute has been successful recently in recruiting new members: Interface Fabrics Group and Frontier Spinning.

We have proposed expanding the *Nonwovens Cooperative Research Center* to the Nonwovens Research Institute giving it a stronger academic mission to supplement its strong research mission. The Center now supports over 20 graduate students. The new institute will have strong formal relationships and joint appointments with the departments of Chemical Engineering and Wood and Paper Science. NCRC Membership stands at 70. The transition from National Science Foundation funding to total industry (and some state) funding has been complete for three years now. The NCRC state-of-the-art melt-blown/spun-bond pilot facility has already shown its potential for major levels of activity. NCRC now has operational responsibility for the Cotton Incorporated staple technology nonwovens laboratory. The second phase of the installation is complete. When Phase 3 is completed, this facility will be worth over 2 million dollars and will complete the missing elements of the Nonwovens infrastructure.

Membership continues to grow at a rapid pace. Most of this growth is due to the establishment of a long term strategic plan that included upgrading the facilities and establishing test-beds for industry. The chart below shows the growth in industry membership funding to the Center.



**Extension**

We have partnered with the NC State Industrial Extension Service (IES) to develop and deliver an outstanding Six Sigma Program. Some of the companies we have been working with include PGI, Parkdale Mills, Belk Department Stores, Duke University Hospital System, BB&T, Curtiss Wright Controls, Nucor Steel, Wyeth Pharmaceuticals and Gerdau Ameristeel. All of the companies have selected projects that apply the Six Sigma principles that they have learned in the educational programs. The focus of all the projects is on the customer and the impact on the bottom line of the company. Our Six Sigma implementation projects consist of classroom instruction, laboratory experimentation, project definition, coaching, project completion and economic analysis of positive project impacts.

Table 2. 2005-2006 Six Sigma Program Highlights

Number of workshops (total)	19
Number of new workshops	6
Number of training days	182
Number of participants (Total)	350
Number of Participants (NC)	288
Economic Impact (reported to date)	\$2,800K
Gross Revenue (Total)	\$1,074K
Gross Revenue to COT	\$340K

Our Short Course Program has been very active in 2005-2006. We have courses in the Program

from Introduction to Apparel Manufacturing to Leadership Essentials for Effective Change Management—a course that blends the strength of project management with the finesse of change leadership. A series of courses have been added to meet the ever-increasing demand for education in the nonwovens field. Additional courses include Weaving and Knitting Fundamentals that will comprehensively cover the manufacture and design of knit and woven fabric. We have aligned our In-Plant Education Program with companies such as the Gap, Wal-Mart, Sears and Abercrombie & Fitch. For 2005-2006 we have developed two new courses in our partnership with Cotton, Incorporated.

Table 3. 2005-2006 Short Course Program Highlights

Number of short courses (total)	15
Number of new short courses	5
Number of training days	56
Number of participants (Total)	245
Gross Revenue (Total)	\$142K

The College houses a number of multi-use labs used for research, teaching and industry services offered through the use of an ATA (Analysis and Testing Agreement). The total value of ATA contracts issued by various groups within the College is shown in Table 4 below.

Table 4. 2000-2006 ATA Contracts

	2000	2001	2002	2003	2004	2005	2006
<b>TexLabs</b>	440625	476769	309973	231970	197530	110320	114744
<b>NCRC</b>	N/A	N/A	N/A	N/A	653788	473067	747879
<b>TPACC</b>	N/A	N/A	N/A	N/A	277735	173020	192750
<b>TECS</b>	N/A	N/A	N/A	N/A	23800	73420	38361
<b>TATM</b>	N/A	N/A	N/A	N/A	21640	11300	19573
<b>TOTAL</b>	<b>440,625</b>	<b>476,769</b>	<b>309,973</b>	<b>231,970</b>	<b>976,963</b>	<b>730,807</b>	<b>998,563</b>

### **Faculty and Staff**

Two new outstanding textile engineering faculty were added: Dr. Xiangwu Zhang and Dr. Melissa Pasquinelli. Dr. Timothy Clapp became Director of Textile Education for Extension and Economic Development. Faculty members published over 155 papers, a book chapter, and edited

a new book. They made over 175 conference presentations, submitted 24 patent disclosures, and had three patents issued. Dr. Jeff Joines was selected as the College of Textiles Outstanding Teacher, a Member of the Academy of Outstanding Teachers, and recognized as one of four outstanding teachers at NCSU. Dr. Jon Rust was the college nominee for the Board of Governors' Teaching Award. Dr. David Hinks was our nominee for the Alumni Association Distinguished Undergraduate Professor Award, and Dr. Alan Tonelli was elected Chair of the North Carolina Section of the American Chemical Society. Dr. Tushar Ghosh received the Town of Cary's Multi-Cultural Arts Award, T. Michael Ferguson and Shawn Dunning received University Outstanding Extension Service Awards, Dr. Behnam Pourdeyhimi was profiled in *Nonwovens Report International*, and Dr. A. Blanton Godfrey was selected as Deming Lecturer by the American Statistical Association.

### ***Students***

This year our students have had success on many fronts. Eight students won \$5,000 design scholarships from the Young Men's Wear Association. One student won a scholarship from Disney for her design of a new Mary Poppins theme restaurant, and five students were selected by Freudenberg to present their new nonwovens apparel designs at a special show in Germany. We had five Phi Beta Kappa inductees, five Valedictorians, and approximately 30% of our graduates receiving two degrees. Two students received the NCSU Alumni Fellowship Award, and another student received the Graduate School's Thesis of the Year Award. Four of our undergraduates won research awards, and three of our graduate students won National Textile Center honors. Freshman enrollment has continued to grow, enrollment in 2005 was the highest in the past twenty years. We expect Fall 2006 to be almost ten percent higher

### ***Fund Raising***

Over the past year, we have made continued progress in our development campaign reaching over \$46 million of our \$50-million goal. We received a significant gift of \$1.5 million from Steve and Frosene Zeis.

## ***Administration***

We have made several major changes in the administration of the college. The most significant was the appointment of Dr. Tim Clapp as Director of Textile Education for Extension and Economic Development. This department has undertaken an ambitious program to expand our educational offerings to industry. Under the leadership of Dr. Behnma Pourdeyhimi we have also started a major restructuring of our college laboratories. Our Information Technology Department maintains over 850 computing systems for faculty, staff and students and supports over 800 networked devices on our systems. They provide a computer literacy assessment for all students in our introductory course covering general computing concepts, spreadsheets, presentation software, and word processing. They support over 1.63 terabytes of files with the goal of providing each faculty member with 10 gigabytes of shared disk space. They have also implemented WebEx software to allow all faculty and staff in the college to host webinars and created a College of Textiles Storefront allowing conference and course registration online by credit card. Information Technology has developed the capabilities for the College to offer 43 undergraduate and graduate programs in digital formats. They have helped develop virtual labs and provided support to AATCC, INDA, ITT, NTC and the Fiber Society as well as to the College.

## ***Recommendations and Concerns for the Future***

Our main concern continues to be the level of salaries for faculty and staff. Our top faculty are vulnerable to better offers from other universities and industry. The budget reductions over the past years continue to cause many problems. We have serious challenges in raising the funds for the investment in faculty and labs for building our future. Several new programs give us an opportunity for significant growth. Our most important challenges are having the resources to support our program changes and expanding critical research funding sources. Many opportunities for new research directions require matching funds and serious investments. Attractive start-up packages for new faculty continue to be major challenges.