ADVANCED TECHNOLOGICAL EDUCATION

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

Division of Undergraduate Education
Division of Elementary, Secondary, and Informal Education
ADVANCED TECHNOLOGICAL EDUCATION

FY2006
- Preliminary Proposals: April 26, 2005
- Formal Proposals: October 18, 2005

FY2007
- Preliminary Proposals: April 25, 2006
- Formal Proposals: October 12, 2006

NSF 05-530
Purpose of ATE

The ATE program promotes improvement in the education of science and engineering technicians at the undergraduate and secondary school level and the educators who prepare them, focusing on technicians for high-technology fields that drive the nation’s economy.
**Advanced Technological Education Program**

Projects which focus on one or more aspects of:

- Program Improvement;
- Professional Development for Educators;
- Curriculum and Educational Materials Development;
- Teacher Preparation;
- Research on Technician Education; or
- Institution-Level Reform of Technician Education

**Centers of Excellence – National, Regional, Resource**

- [http://www.ATECenters.org](http://www.ATECenters.org)
ATE: Tracking the Changes

First ATE Program Solicitation: Centers, Projects, Planning Grants, and Special Projects, Workshops and Conferences ($14.5)

Technical Experiences for Students Activity added. Planning Grants Dropped. ($23.3)

Technical Experiences for Faculty Activity added. ATE Program Evaluation begins at Western Michigan ($31.5)

Adaptation and Implementation Activity added ($31.5)

Regional Centers added (Manufact. or IT); Planning Grants Reinstated; Resource Centers and Pre-Service Teacher Prep Activities added; New track: Articulation Partnerships ($39.5)

Centers: Funding & Duration Increased. Program Improvement Activity Restructured. ($38.1)

Large Scale Materials Development, Large Scale Teacher Prep, and Research Track added ($38.1 [FY04 Request])

**Program Funding Levels are in millions of dollars**
Changes in the Program for 2005

- Articulation Partnerships track has been eliminated
- Technical experiences for students and laboratory development are included in program improvement, rather than as separate activities
- Teacher preparation activities focus on technology preparation for K-12 preservice teachers
- Large scale teacher preparation has been eliminated
Changes in the Program for 2005 (Continued)

- Regional centers can be in any technological field
- National centers may also focus on technician education in multiple fields
- Preliminary proposals are optional for all tracks
- Equipment requests for projects have been changed to $150,000 total
Number of Awards per State in ATE’s 11 Year History
Total number of Awards 601
## Foci of ATE Awards

<table>
<thead>
<tr>
<th>Field</th>
<th>FY 96-01</th>
<th>FY 2002</th>
<th>FY 2003</th>
<th>FY 2004</th>
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<tr>
<td>Biotechnology</td>
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<td>Chemical Technology/Pulp &amp; Paper</td>
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<td>8</td>
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<tr>
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<td>Other Engineering Technology</td>
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<td>12</td>
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<tr>
<td>Environmental</td>
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<tr>
<td>Geographic Information Systems</td>
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<td>2</td>
<td>2</td>
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<tr>
<td>Manufacturing</td>
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<td>12</td>
<td>7</td>
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<tr>
<td>Math/Physics</td>
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<td>9</td>
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<td>2</td>
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<td>14</td>
<td>19</td>
<td>12</td>
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<tr>
<td>Marine/Agriculture/Aquaculture/Nat. Res.</td>
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<td>1</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Teacher Preparation</td>
<td>10</td>
<td>5</td>
<td>8</td>
<td>6</td>
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<tr>
<td>Multimedia</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
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<td><strong>Totals</strong></td>
<td><strong>306</strong></td>
<td><strong>60</strong></td>
<td><strong>66</strong></td>
<td><strong>62</strong></td>
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</table>
ATE Program Budget

Millions of dollars

FY94 FY95 FY96 FY97 FY98 FY99 FY00 FY01 FY02 FY03 FY04 FY05

NSF
Advanced Technological Education
FY 2005 Awards

Formal Proposals Received 242
Total Funds Requested: $ 194 M
Total Funds Available: $ 44.2 M *
Continuation Funding FY 01 - 04 Awards $ 23.8 M
New Award Funds for FY2005: $ 20.4 M

Types of New Awards:

Projects 42
Regional Centers 3
Resource Centers 3
Articulation Partnerships 7

Funding Rate for New Awards: 23%

* Budget is about $45.2, but $1 million for panels, monitoring and other administrative expenses.
Advanced Technological Education
FY 2006

Preliminary Proposals Received 214
Preliminary Proposals Reviewed 204
Total Funds Requested: $194 M
Total Funds Available: $44.2 M
(Budget is about $45.2, but $1 million for other)
Commitments on FY 02 - 05 Awards (anticipated): $24.4 M
New Award Funds for FY2006: $19.8 M
Anticipated out-year commitments for new awards $23.0 M

Preliminary Proposals Encouraged 120 (59%)
Preliminary Proposals Discouraged 84 (41%)
Proposals Received by Oct. 18 Deadline 231
ATE Centers of Excellence (31)

- National Center
- Regional Center
- Resource Center

(AK, HI, (DC))
Center for the Advancement of Process Technology

College of the Mainland, Texas
DUE-0202400

- Partners with major petrochemical and refining industries, 2-year colleges, and universities in TX and LA with links to other states and builds on accomplishments of the Gulf Coast Process Technology Alliance
- Include curriculum development and improvement, instructional materials development, faculty enhancement, dissemination, and collaboration efforts
- Serves industry sectors including chemical and refining, exploration and production, pharmaceuticals, and power generation
Regional Centers

- Former -- Manufacturing Technology or Information Technology
- Regional focus - serves the needs of industry in a region
- Collaboration among colleges and secondary schools
- Collaboration with industry in the region
- Activities include curriculum adaptation, faculty and teacher development, establishment of partnerships, and recruitment and retention strategies, all directed toward regional workforce needs
- Clear, measurable impacts on quantity and quality of students for the workforce
Center for the Advancement of Systems Security and Information Assurance (CASSIA)

Moraine Valley Community College      DUE 0302612

- Focusing on homeland security in a 5 state region
- Collecting, adapting, and enhancing curricula in cybersecurity
- Offering AAS degrees and certificates in IT security and data assurance and a BS program in computer science
- Providing professional development for college faculty and internships for students
Program Improvement

Activities might include:

- Integrating industry standards and workplace competencies into the curriculum
- Adapting educational materials or courses developed elsewhere
- Adding rigorous STEM content to programs and courses
- Providing professional development to educators
- Developing articulation agreements between two-year colleges and secondary schools or four-year institutions
- Improving recruitment or retention of students
Forming partnerships with manufacturers in the automotive industry, sec. schools, univ., and the Alabama Technology Network

Focusing on industrial maintenance and automated manufacturing

Enhancing faculty and building curriculum

Establishing entry and exit requirements for programs

Led to the establishment of an ATE Regional Center CARCAM involving 5 community colleges and numerous first, second, and third tier auto firms
ATE Teacher Preparation in Two-Year Colleges FY 2001 - 2005

All projects involve 2 and 4-year institutions and aim to:

- Increase number, quality, and diversity of prospective K-12 teachers in preprofessional programs in two-year colleges.
- Improve technological literacy of prospective K-12 teachers at all levels and their understanding of the modern workplace.
- Strengthen prospective K-12 teachers’ preparation in mathematics and science.
Creating Pathways for Prospective Science and Mathematics Teachers in a Technology Enriched Environment

Antelope Valley College 0402690

- Increasing the number, quality, and diversity of mathematics and science middle school teachers
- Enrolling students in technology-rich classes also supported by the Mathematics Science Engineering Technology Consortium that includes 50 regional businesses, 16 school districts, and many others
- Working with Cal State Bakersfield to provide pathways to baccalaureate degree
- Using hands-on, inquiry based learning, field experiences, and summer institutes
168 out of 171 projects and centers surveyed reported (out of about 250 active awards)

65,000 students in at least one ATE class

Students are 36% female and 25% African American, Hispanic, American Indian, or Hawaiian

Over 28,000 faculty and teachers were involved in workshops or other activities to assure that their knowledge and skills are current

Projects leveraged $38 million in additional funds, increasing total support over NSF dollars by 90%
Recent Reports from ATE Evaluation by Evaluation Center — Oct. 2006

- Reporting — 167 out of about 250 active awards *
- 37,576 secondary school, 124,872 associate degree, and 6138 baccalaureate degree, and 10896 on-the-job students taking at least one ATE course
- 13,359 secondary school teachers, 12,740 associate degree faculty, and 4297 baccalaureate degree faculty participated in an ATE sponsored professional development opportunity
- 7867 businesses and industry partners, 1255 public institutions, and 963 other educational institutions are collaborating in the awards

* Must be active more than a year to report
Gender and Ethnicity of Associate Degree Students *

**Gender**
- Male 63.5%
- Female 36.5%

**Ethnicity**
- White (non-Hispanic) 74.2%
- Hispanic/ Latino 9.1%
- African American 9.7%
- Asian 2.6%
- Multiracial 2.3%
- American Indian 1.4%
- Native Hawaiian 0.6%

* Gender and Ethnicity Reported on 69,219 of the 124,872 associate degree students
Some Best Practices in Working with Industry Identified by ATE PIs

- Get industry involved early and be flexible
- Assure persistence and critical mass of partners
- Use industry experts to help with curriculum development and project evaluation
- Have joint membership of industry and academia on Workforce Development Boards
Some Best Practices in Working with Industry Identified by ATE PIs

- Focus on needs for the high performance workplace
- Get decision makers involved
- Link company research and colleges in training of technicians
- Provide flexible pathways for students
The Role of Community Colleges in the Education of Recent Science and Engineering Graduates

- 44% of all S & E 1999 and 2000 graduates with a bachelor’s or master’s degree attended a community college (more than 50% of the bachelors and 35% of the masters)
  - 42% of computer science and mathematics degrees
  - 46% of life and related sciences
  - 37% of physical and related sciences
  - 45% of social and related sciences
  - 40% of engineers

- 51% of Hispanic bachelor’s and masters graduates and 18% of the Hispanic Ph.D.s attended a community college

NSF InfoBrief (NSF 04-315)
62% of female graduates and 51% of male graduates who had children attended a community college.

65% of graduates in the Pacific region (California, Washington, Oregon, and Hawaii) attended a community college.

42% of the graduates who had a GPA between 3.75 and 4.00 attended a community college.
Information and Inquiries

DUE Information System
- Email: undergrad@nsf.gov
- Phone: 703-292-8670
- Fax: 703-292-9015

DUE Web Site
http://www.ehr.nsf.gov/EHR/DUE/

DUE Project Information Resource System
http://www.ehr.nsf.gov/PIRSWeb/Search/

DUE Mailing Address
- NSF, Division of Undergraduate Education, 4201 Wilson Boulevard, Room 835, Arlington, VA 22230