

## ***AdvanceVT Project Overview and Progress to Date***

Virginia Tech proposed to the National Science Foundation a comprehensive program to promote and enhance the careers of women faculty in science and engineering. *AdvanceVT* has four major program elements addressing institutional barriers that have constrained the advancement of women faculty members in the sciences and engineering and targeting institutional culture, practices, and leadership development needs specific to Virginia Tech. These four program elements are institutionalizing change, empowering women as leaders and scholars, increasing the representation of women in science and engineering, and advancing women into faculty careers. A comprehensive portfolio of assessment techniques tracks the impact of individual program activities as well as the program as a whole.

At this point, halfway through the grant funding, significant progress has been made in all four program elements, but much work remains to be done. Some activities have been implemented as planned, while others have been adjusted to incorporate lessons learned from other Advance institutional transformation programs or to address changing circumstances at Virginia Tech. Major accomplishments include establishment or revision of family friendly policies on dual career hiring, stopping the tenure clock, and modified duties, implementation of a leadership development program for tenured women faculty, education of search committees on unconscious bias in evaluation of candidates, and creation of programs to support and encourage graduate students preparing for faculty careers. These efforts are reflected in a dramatic increase in the number and proportion of women faculty in the College of Engineering, from 21 (7.3%) in fall 2001 to 39 (13.7%) in fall 2005. *AdvanceVT* also conducted a campus-wide climate survey and shared the findings with faculty and top administrators. During the final two years of grant funding, increased attention will be paid to mechanisms for institutionalization of *AdvanceVT* programs and activities.

As a first step towards institutionalizing change, a work group of Virginia Tech faculty and administrators reviewed existing university policies that disproportionately impact women faculty and worked with the university's Commission on Faculty Affairs to obtain approval of new and revised policies. Small group discussions at *AdvanceVT*'s first annual Advancing Women at Virginia Tech workshop prioritized issues of concern. To date, Virginia Tech has developed guidelines on dual career hiring (available on the provost's web site, <http://www.provost.vt.edu/Guidelines.html>), established a Dual Career Coordinator position in the Human Resources department, and printed a brochure on available assistance for dual career hires for department heads and search committees to provide to faculty candidates. Virginia Tech's long established "stop-the-clock" policy allowing faculty to extend the probationary period under certain circumstances, such as pregnancy and childbirth, has been revised. A university committee was established and has presented recommendations to the president and provost addressing the need for additional child care options. A modified duties policy will be presented to the Board of Visitors for approval this summer.

*AdvanceVT* implemented a leadership development program in response to a low level of interest in its proposed leadership placements. The program employs assessment and feedback on individual strengths and weaknesses to create an individualized development and coaching program for a small cohort of tenured women faculty. In addition to individualized action plans, the women participate in workshops to familiarize them with the roles of university leaders and to develop skills such as negotiating and team building. Some of the women in the first cohort of the program have already moved into department head and associate dean positions, and the

university is in the process of developing a leadership program for all faculty that will build on the experience of the *AdvanceVT* program.

Following the example of another Advance Institutional Transformation program, *AdvanceVT* reviewed the literature on unconscious bias in evaluations and prepared a brochure and presentation for search committees to increase their awareness of gender schemas that disadvantage women candidates for faculty positions. Faculty members use the presentation and brochure to educate their peers about the research on these issues and other keys to successful faculty searches. While this work is ongoing, the university hired a record number of women faculty in 2004-05.

*AdvanceVT* hosts a series of lunch seminars for graduate students preparing for faculty careers. The seminars are open to all graduate students and post-doctoral associates, but focus on issues of particular importance to women in science and engineering. One workshop attendee commented “*AdvanceVT* has provided positive support for pursuing an academic career, not only through workshops but also by providing role models.” In addition, the graduate school, in collaboration with the college deans and the provost, has established a work-life grant program to provide temporary financial assistance to departments to enable them to continue support for female graduate students during pregnancy and childbirth. Departments can request financial assistance equivalent to a graduate assistantship stipend for 6 weeks. The funds may be used in a variety of ways to ensure that the research/teaching effort is not adversely impacted and the graduate student continues to be supported while she is on leave.

Virginia Tech’s proposal to the National Science Foundation’s ADVANCE program illustrated issues faced by women faculty in the sciences and engineering through the story of Gail, an “everywoman” faculty member. Prior to Virginia Tech’s receipt of an Advance grant, Gail is challenged by male students in the classroom, excluded from informal faculty networks, and burdened by excessive demands for committee service and outreach activities. The proposal envisioned Gail five years after the Advance program, confidently leading a research center, mentoring women graduate students towards faculty careers, and a respected member of a supportive network of faculty colleagues.

Today, halfway through Virginia Tech’s five-years of NSF funding, we would portray Gail as having attended several *AdvanceVT* events, including the annual Advancing Women at Virginia Tech workshop, where she saw her department head, dean, provost, and even a few male colleagues listening attentively to Virginia Valian discuss gender schemas. Through *AdvanceVT*, she has met several female colleagues from other departments and colleges, and now has coffee with a few of them on a regular basis to discuss pedagogical issues, plan grant proposals, and gripe about service commitments. One of Gail’s female graduate students is expecting a baby and she plans to take advantage of the graduate school’s work-life grant program to keep her research going. Gail expects to receive tenure next year, and plans to apply to *AdvanceVT*’s leadership development program to help her prepare to lead a research center.

The following table summarizes progress to date towards project goals identified in the original proposal.

## AdvanceVT Proposal Activity Status (Keyed to Interview Schedule)

Activity (described in proposal)	Overall Outcome Measures and Process Assessment Measures	Status
<p style="text-align: center;"><b>Institutionalizing Change</b></p> <p style="text-align: center;"><b>(Policy Element)</b> <b>Chair: Pat Hyer</b></p>	<p><b>Measurable Outcome:</b> A change in the awareness, attitudes, and behaviors of key administrators and faculty members in engineering and the sciences regarding gender equity issues.</p>	<ul style="list-style-type: none"> <li>• Advance professors and project director met individually with department heads in colleges of science and engineering during year 1 to share information about <i>AdvanceVT</i> and learn about department head concerns.</li> <li>• New department heads (5 of 11 department heads in college of engineering were new in year 2) participated in two-day orientation program organized by the provost's office and <i>AdvanceVT</i>. Program is now institutionalized in the provost's office.</li> <li>• In spring 2005 university-wide survey of instructional and research faculty, 78% of female tenure-track faculty and 50% of the male tenure-track faculty said they had heard of the <i>Advance</i> initiative.</li> <li>• <b>Interviews #1, 2, 4, 5, 18, 7, 28, 26, 3</b></li> </ul>
<p>1. Retreats and work groups to build awareness among faculty and departmental /college leaders</p>	<p>Record of attendance at ADVANCE related programs with the intention that one-third of tenure-track faculty and all departmental and college administrators in participating disciplines will participate in at least one ADVANCE related program over the five-year period.</p>	<ul style="list-style-type: none"> <li>• 47 faculty and 28 administrators serve on <i>AdvanceVT</i> work groups and committees.</li> <li>• <b>Interviews 4, 7, 8, 9, 14, 15, 21 (Grabau), 25, 27, 28, 29 (Easterling), 32 (Wynn), 33</b></li> <li>• Three <b>annual campus-wide Advance conferences</b> attracted 160 participants in Jan 2004, 150 participants in Jan. 2005, and 106 participants in Feb. 2006. <b>(Most interviewees have attended at least one conference.)</b></li> <li>• <i>AdvanceVT</i> team members presented annually to the university-wide monthly department head breakfast program. <b>(Interviews 3, 7, 26, 28)</b></li> <li>• <b>University-wide workshop for deans and department heads</b> held Oct. 24, 2005 to review findings of work-life survey and focus groups was attended by 100+ participants. <b>(Interview 4)</b></li> <li>• Assoc. Provost (<i>AdvanceVT</i> Co-PI) met with dept. heads in each college each year to address work-life policies and their implementation (dual career, stop-the-clock, etc.) <b>(Interview 4, 2, 18, 3, 7, 26, 28)</b></li> <li>• <i>AdvanceVT</i> team members made presentations to Faculty Senate, several college faculty associations, Board of Visitors, and university commissions concerning work-life survey data.</li> <li>• <i>AdvanceVT</i> prepared and widely disseminated full-length and short reports featuring data from work-life survey, focus groups, and exit survey data. <b>(Interviews 4, 6)</b></li> </ul>
<p>2. Visits to and interaction with other ADVANCE project sites or peers with successful programs addressing gender in S&amp;E</p>	<p>Record of participation by project staff, department heads, and faculty.</p>	<ul style="list-style-type: none"> <li>• 12 <i>AdvanceVT</i> representatives have attended annual NSF ADVANCE PI meetings. <b>(Interviews 1, 3, 4, 6, 9, 13, 14, 15, 27, 37)</b></li> <li>• Provost (PI), Assoc Provost (Co-PI), and Faculty Senate President participated in invitational Sloan-ACE Conference on implementation of Flexible Faculty Policies, Sept 2005. <b>(Interviews 1, 4, 29 Rinehart)</b></li> <li>• Guest speakers from other Advance institutions featured at annual <i>AdvanceVT</i> conference (U Wisconsin, U Wash, Georgia Tech, NSF in 2004;U Washington, Hunter College in 2005).</li> <li>• <i>AdvanceVT</i> coordinated national meeting of engineering deans and NSF program officers to discuss Advance related issues, Dec. 2005 (110 attendees). <b>(Interviews 1, 13, 27)</b></li> <li>• Team members participated in multiple national panels/symposia on Advance-related initiatives (AAAS, ASEE, SWE, WEPAN, ASHE). <b>(Interviews 4, 6, 13)</b></li> <li>• Department heads of chemistry, engineering science and mechanics, and mining attended special programs organized by U. Washington and ACS. <b>(Interview 7)</b></li> <li>• Assessment Director and Director of Women's Center conducted interviews and site visits to</li> </ul>

## AdvanceVT Proposal Activity Status (Keyed to Interview Schedule)

		<p>other Advance institutions as part of Advance benchmarking study and dissertation research; presented findings to annual Advance conference and NSF PI meeting in 2006. <b>(Interviews 6, 37)</b></p> <ul style="list-style-type: none"> <li>Assessment director collaborated with Advance team members at the University of Wisconsin, New Mexico State, and Utah State to conduct and analyze interview data from members of couples that were hired through dual career policies. <b>(Interview 6)</b></li> </ul>
<p>3. Focus groups and/or qualitative interviews with women faculty members in S&amp;E to explore their experience in male-dominated fields and to provide the basis for training materials that can be used with retreats and work groups.</p>	<p>Record of participation by faculty women in focus groups or qualitative interviews and record of how the results are used in project-related activities.</p>	<ul style="list-style-type: none"> <li>New faculty in colleges of science and engineering <b>interviewed</b> in 2003 and 2004, with annual follow up of 2003 cohort (11 new hires in the colleges of science and engineering in 2003). <ul style="list-style-type: none"> <li>Positive and negative hiring experiences shared with department heads and search committee chairs. <b>(Interview 6)</b></li> </ul> </li> <li>Hosted lunches with senior women faculty in summer 2004. <ul style="list-style-type: none"> <li>Concerns identified in informal discussions used to prioritize speakers and programs for women faculty. <b>(Interview 27)</b></li> </ul> </li> <li>Conducted <b>small group discussions</b> to identify issues and priorities at each annual workshop and meeting of university deans, directors, and department heads on 10/24/05. <b>(Interviews 4, 6, 9, 13, 14, 15, 27, 37)</b></li> <li>Conducted 5 <b>faculty focus groups</b> with 62 participants, male and female, in spring 2005. <ul style="list-style-type: none"> <li>Summarized and reported findings to president and provost.</li> <li>Hosted university-wide meeting with department heads and other administrators in fall 2005 to discuss findings, presented findings to Faculty Senate and Commission on Faculty Affairs.</li> <li>Results informed and supported policy revisions.</li> <li><b>Interviews 6, 15, 29</b></li> </ul> </li> </ul>
<p>4. Review of institutional policies and programs</p>	<p>Summary of policies and programs in place that affect the gender climate. Recommendations for policy revision to the administrators responsible for their implementation.</p>	<ul style="list-style-type: none"> <li>Developed <b>guidelines for dual career hires</b> (posted on provost's web page) and established Dual Career Assistance Office with full-time coordinator. <b>(Interviews 3, 4, 17, 29)</b></li> <li>Conducted study of <b>child care</b> needs; formed university-wide task force; completed phase I report; utilization analysis underway late spring 2006. <b>(Interviews 4, 6, 14, 17, 27)</b></li> <li>Analyzed <b>stop-the-clock policy</b> usage patterns; revised policy; expect approval by Board of Visitors in June 2006. <b>(Interviews 4, 29)</b></li> <li>Developed <b>policy on modified duties</b>; expect approval by Board of Visitors in June 2006. <b>(Interviews 4, 29)</b></li> <li>Developing conflict resolution/mediation program through University EO Office. <b>(Interview 4)</b></li> </ul>
<p><b>Empowering Women as Leaders and Scholars</b></p> <p><b>(Leadership Element)</b></p> <p><b>Chair: Karen Thole</b></p>	<p><b>Measurable Outcome:</b> A significant increase in the percentage of women in visible positions as academic and technical leaders and as senior scholars in engineering and the sciences.</p>	<ul style="list-style-type: none"> <li>The number of women at the rank of professor in the college of engineering has doubled since the inception of <i>AdvanceVT</i>, and the first female endowed professor in the college of engineering was named last year (an <i>AdvanceVT</i> Co-PI).</li> </ul>
<p>1. Two half-time placements per year for women to serve in key administrative or technical leadership roles.</p>	<p>Record of placements (at least 6 over the five-year period). Participant evaluation of the impact of these placements on their professional development. Increased representation of women in leadership roles over the long term.</p>	<ul style="list-style-type: none"> <li>Two <b>leadership placements</b> completed during year 2. One placement resulted in a new interdisciplinary graduate program in plant sciences. <b>(Interview 33 Dietrich, Winkel)</b> <ul style="list-style-type: none"> <li>Due to a small number of applicants for this program in the first year, no fellowships were awarded for year 3. Instead, an intensive leadership development program was conducted with an initial cohort of 8 tenured women faculty from across the university (see #3 below).</li> </ul> </li> </ul>

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<p>2. Competitive research seed grant support for projects within VTICT priorities, designed to increase productivity and competitiveness of female PIs in sciences and engineering.</p>	<p>Record of grants awarded (one or more per year). Recipient evaluations of impact of ADVANCE project funds in increasing their competitiveness for major research grants. Record of external grant submissions and awards for the three years following ADVANCE.</p>	<ul style="list-style-type: none"> <li>• Five leadership fellowship applications received for year 4, three selected for funding.</li> <li>• 16 <b>research seed grants</b> awarded since beginning of grant, 5 each in years 2 &amp; 3, 6 in year 4. <b>(Interview 32)</b></li> <li>• Successes resulting from the first round of seed grants include one NSF CAREER award and the renewal of a research grant resulting from data generated using the seed money.</li> <li>• All 2003-2004 (year 2) and 2004-2005 (year 3) seed grant recipients were interviewed in spring 2006 to assess the impact of the seed grants on their careers to date. <b>(Interview 6)</b></li> <li>• Matching funds for research seed grants are provided by the college deans. <b>(Interviews 2, 18)</b></li> <li>• Note that VTICT is still in development, and now known as ICTAS (Institute for Critical Technologies and Science), so the seed grants have not been tied to those priorities</li> </ul>
<p>3. Faculty success program (now called Leadership Development Program)</p>	<p>Record of participation in faculty success program. Description of models to promote faculty success. Impact evaluation from participants.</p>	<ul style="list-style-type: none"> <li>• Initiated year-long <b>leadership development program</b> for an initial cohort of eight tenured women from across campus, including skill evaluation and one-on-one coaching in addition to workshops and seminars with Virginia Tech leaders and outside experts. Participants also invited to attend two-day new department head orientation program in summer. <b>(Interviews 9, 21, 27)</b></li> <li>• One participant chosen to be first female Department Head in the Plant Pathology, Physiology, and Weed Science Department effective April 2006 <b>(Interview 21 Grabau)</b>, another leading a large IGERT proposal, one is an Assistant Dean, and one is an Assistant Department Head.</li> <li>• Provost initiated development of a sustainable leadership program at the university level to encourage and support leadership aspirations and success of faculty in all disciplines using <i>AdvanceVT</i> experience to inform university-wide initiative. <b>(Interview 1)</b></li> </ul>
<p>4. Named lecture series to bring visibility to work by women in S&amp;E.</p>	<p>Documentation of scholars' visits (at least two per year over four years).</p>	<p><b>Distinguished Lecturers</b> to date include:</p> <ul style="list-style-type: none"> <li>• Dean (now Provost) Linda Katehi (UIUC)</li> <li>• Dean (now Chancellor) Denice Denton (UC-Santa Cruz)</li> <li>• Vice-President and General Manager Jeanne Rosario (GE-Aircraft Engines)</li> <li>• Dr. Helen Boussalis (Cal State LA)</li> <li>• Dr. Elaine Oran (Naval Research Lab)</li> <li>• Dr. Mildred Dresselhaus (MIT)</li> <li>• Dr. Kathy Banks (Purdue)</li> <li>• Panel of female department heads and research center directors <b>(Interview 27)</b></li> </ul>
<p>5. A flexible work/life fund to meet varied needs for women faculty members.</p>	<p>Record of grants to work/life fund recipients. Participant evaluations of the effect on their productivity.</p>	<p><b>This priority was eliminated</b> when the budget was reduced in response to NSF directive at the outset of the grant.</p>
<p style="text-align: center;"><b>Increasing representation of women</b></p> <p style="text-align: center;"><b>(Recruitment Element) Chair: Beate Schmittmann/Nancy Ross</b></p>	<p><b>Measurable Outcome:</b> A significant increase in the percentage of women faculty in S&amp;E at VT.</p>	<ul style="list-style-type: none"> <li>• The number and proportion of tenured and tenure-track women in the 8 academic colleges increased from 299 (20.4%) in fall 2001 to 308 (22.8%) in fall 2005, despite a 7.4% reduction in total faculty size due to severe state budget reductions.</li> <li>• The number and proportion of women in the College of Engineering has increased dramatically, from 21 (7.3%) in fall 2001 to 39 (13.7%) in fall 2005.</li> <li>• The College of Science experienced a significant loss of total faculty since 2001 (12%). The proportion of women remains the same (15.7%); the number of tenured and tenure-track women dropped from 34 to 25 in 2004, then rebounded to 30 in fall 2005. Two women faculty in the College of Science are now associate deans, and so not included in the faculty total.</li> </ul>
<p>1. Intensive work with</p>	<p>A web site and manual or similar tools</p>	<ul style="list-style-type: none"> <li>• Existing <b>manual for faculty searches</b> was reviewed, updated, and is available on EO</li> </ul>

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<p>search committees to develop more skills and success in recruiting women.</p>	<p>documenting recruitment resources for faculty searches in the sciences and engineering.</p>	<p>website. <b>(Interview 34)</b></p> <ul style="list-style-type: none"> <li>• Updated and enhanced list of discipline-specific list serves, websites, etc. for dissemination of faculty openings to women and underrepresented minorities, available on EO website.</li> <li>• New positions in the College of Science and the College of Liberal Arts and Human Sciences focus on recruiting diverse faculty. <b>(Interview 25)</b></li> <li>• Developed brochure on "<b>Unrecognized Biases and Assumptions</b>" in collaboration with the EO office based on U Wisconsin example, now distributed widely to faculty search committees. <b>(Interview 34, 37)</b></li> <li>• Developed presentation of "<b>Best Practices for Faculty Searches</b>" in 2005, presented widely to search committees in the College of Engineering and at faculty meetings/retreats in the College of Science. Made available on <i>AdvanceVT</i> and several departmental web sites. <b>(Interviews 25, 33 Bell)</b></li> <li>• Tenured and tenure-track faculty respondents to spring 2005 university-wide survey who had participated in a search committee over the last two years indicated they engaged in the following recruitment activities:             <ul style="list-style-type: none"> <li>○ 54% contacted a colleague outside VT to help identify women and minority candidates</li> <li>○ 47% identified a woman or minority candidate for a position at a conference or professional setting</li> <li>○ 67% encouraged a woman or minority candidate to apply</li> <li>○ 23% invited a woman or minority scholar to give a talk at VT as a pre-recruitment effort</li> <li>○ 15% asked to meet with women or minority doctoral students or post-docs when visiting or lecturing on other campuses</li> </ul> </li> </ul>
<p>2. Visits to other campuses and conferences to make connections.</p>	<p>Documentation of recruitment trips (at least five) by project staff, department heads, and faculty. Tracking of women identified through visits and conferences to determine whether they were offered a position and outcome of offer.</p>	<ul style="list-style-type: none"> <li>• Faculty are encouraged to recruit for Virginia Tech and for their departments at every possible opportunity and meet with students and post-docs to invite applications for openings at Virginia Tech.</li> </ul>
<p>3. Hosting potential faculty members in advance of degree completion.</p>	<p>Portfolio of the best examples of recruitment strategies conducted by departments as a result of ADVANCE-funded initiatives.</p>	<ul style="list-style-type: none"> <li>• <b>17 visits from junior or mid-career scholars</b> sponsored to date as part of <i>AdvanceVT</i> Visiting Scholar program, 3 of these women have been hired into tenure-track positions. <b>(none of the hires are available for interviews)</b></li> <li>• <i>AdvanceVT</i> leadership team members meet with numerous faculty and administrative candidates during interviews to introduce <i>Advance</i> goals and programs and to make connections with existing women faculty. <b>(Interviews 9, 14, 25, 27)</b></li> <li>• <i>AdvanceVT</i> routinely highlighted in job announcements in engineering and science.</li> <li>• Individual intervention and assistance by <i>Advance</i> professors sought from administrators in cases of retention of women faculty members.</li> </ul>
<p><b>Advancing women into faculty careers</b></p> <p><b>(Pipeline Element)</b> <b>Chair: Nancy Love</b></p>	<p><b>Measurable Outcome:</b> A significant increase in the percentage of women in engineering and the sciences who choose a faculty career.</p>	<ul style="list-style-type: none"> <li>• Efforts are underway to obtain this information from the NSF's Survey of Earned Doctorates.</li> </ul>
<p>1. Establish a program for preparing the future professoriate.</p>	<p>Record of participation in seminars, assessment, and individualized experiences designed to prepare women</p>	<ul style="list-style-type: none"> <li>• As part of Virginia Tech's Transformative Graduate Education initiative, the graduate school offers courses in Preparing the Future Professoriate and Pedagogical Practices in Contemporary Contexts. <i>AdvanceVT</i> seminars are intended to complement this initiative.</li> </ul>

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	<p>for faculty careers in S&amp;E (at least 80 participants over five years). Reflections of participants on the change in their goals and expectation over the course of the program.</p>	<ul style="list-style-type: none"> <li>• AdvanceVT hosts <b>monthly lunch seminars</b> during the academic year for graduate students and post-docs on aspects of getting started in faculty careers (e.g., academic job interviews, curriculum vitae, negotiations, grant writing, presentations). <b>(Interviews 14, 35)</b></li> <li>• 120 students and post-docs attended one or more AdvanceVT seminars in 2005-06.</li> <li>• Surveyed 2005-06 seminar attendees for feedback and suggestions for additional topics.</li> <li>• Female doctoral students participated in mock interviews before their first faculty interview.</li> <li>• Planned <b>national conference</b> for women doctoral candidates and post-docs in science and engineering for July 2006 at Virginia Tech, with special emphasis on women of color. Coordinated with UMBC Advance program to advertise programs and select participants. <b>(Interview 8)</b></li> </ul>
<p>2. Expand the Dissertation Year/Post-doctoral Fellowship Program for Academic Diversity</p>	<p>Record of participation in the program (at least six over the five-year period, with at least two of these joining the faculty at Virginia Tech). Participant evaluations of the value of this program in preparing them for successful transitions to a faculty career. Long term tracking of career development.</p>	<ul style="list-style-type: none"> <li>• Three <b>PhD Fellowships</b> awarded for year 2, two in year 3, and two for year 4. <b>(Interview 20)</b></li> <li>• Two <b>post-doctoral fellowships</b> were awarded in year 2. Due to a low response to this program, the criteria have been redefined. As a result, 14 applications were received for year 4, with 5 selected for funding. <b>(Interview 39)</b></li> </ul>