

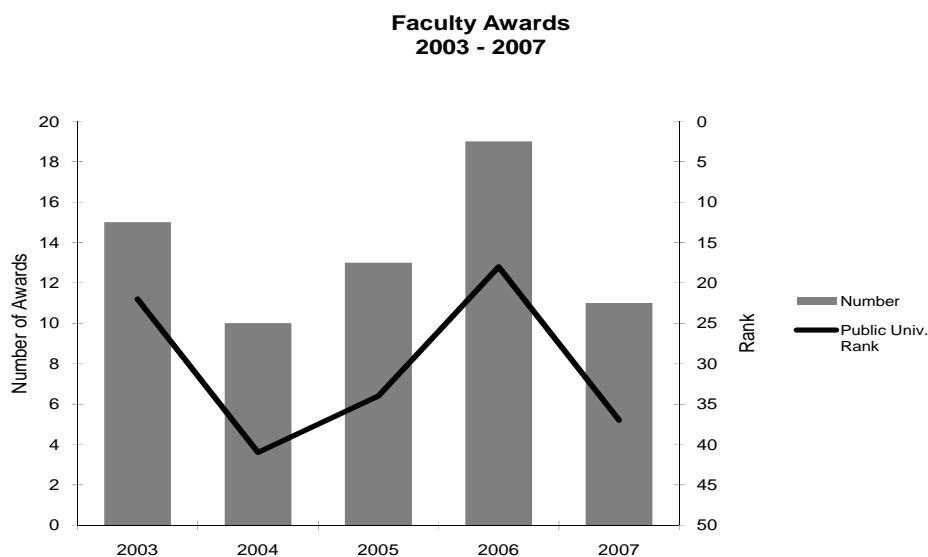
## Standard Five: Faculty

### I. The Faculty

#### Description

Faculty form the backbone of a great public research university: They create and transmit new knowledge that prepares students for challenges ahead, while providing innovations and insights to improve quality of life and propel economic development. The best introduction to the UMass Amherst faculty, its strengths and its prospects, is found in [Framework for Excellence](#), which summarizes the faculty’s current state and plans for addressing the institution’s faculty needs in the coming decade. The *Framework for Excellence* has been widely distributed and read within the campus community. It states: “The key to any great research university is the quality of its faculty. We are fortunate at UMass Amherst to have a faculty of extremely high quality. In every year but one since 2000 we have ranked among the top 40 public research institutions in faculty awards.” (Figure 5.1)

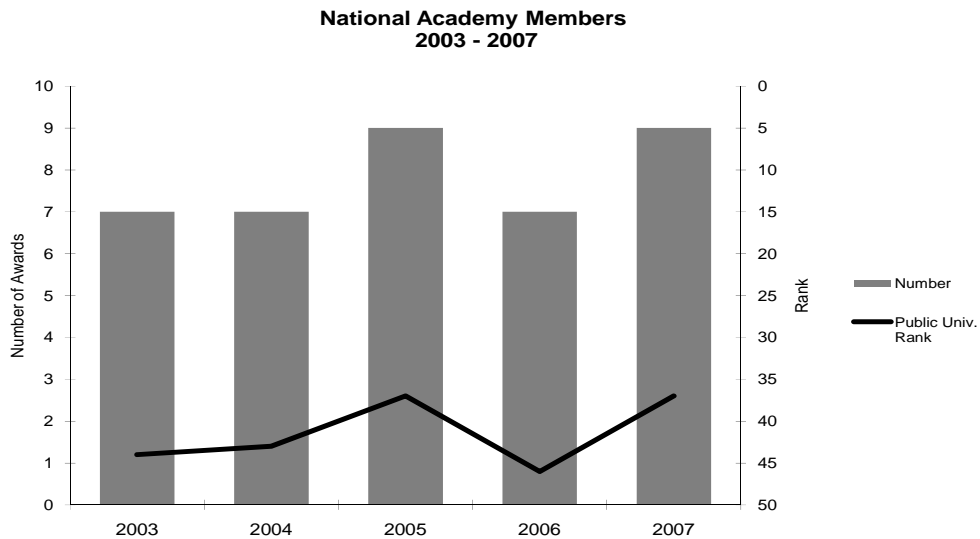
Figure 5.1



Faculty Awards	2003	2004	2005	2006	2007
Number	15	10	13	19	11
Public Univ. Rank	22	41	34	18	37

The *Framework for Excellence* further says: “For the past decade we have also ranked among the top 50 public research institutions in National Academy memberships, which is all the more remarkable considering one of the three academies is restricted to members of medical school faculties (Figure 5.2). We have many faculty members with international reputations in their disciplines, as well as some of the top-ranked academic programs in the country. The reputation of our faculty in turn allows us to recruit outstanding faculty from around the world.”

Figure 5.2



**National Academy**

Members	2003	2004	2005	2006	2007
Number	7	7	9	7	9
Public Univ. Rank	44	43	37	46	37

The quality of the UMass Amherst faculty remains notably high. However, the total number of instructional faculty fell by about 9 percent from fall 1987 to fall 2008, as shown in Table 5.1. Significant to UMass Amherst’s aspirations as a rising public research university, the number of tenure-system faculty fell by nearly 20 percent during this time – from 1,201 to 975. As Table 5.1 shows, the decline in total instructional faculty has been offset by rising numbers of non-tenure system faculty; this subset nearly doubled from 1987 to 2008. Ninety-two percent of total full-time instructional faculty were in the tenure system in 1987; that fell to 83 percent by 2008.

As described in Standard Two, the Amherst 250 plan – launched in 2005 and made possible with climbing state appropriations at that time – sought to restore tenure-system faculty to levels in the late 1980s. Amherst 250 resulted in funding for a total of 150 positions during fiscal years 2006, 2007 and 2008. The breakdown of positions by year was: 48 for 2006, 45 for 2007 and 57 for 2008. The impact of Amherst 250 is seen in Table 5.1. The unfolding of a financial crisis in fiscal year 2009 interrupted plans for growth in the tenure-system faculty.

Table 5.1

## Full-Time Instructional Faculty Fall 1987-Fall 2008

	Tenure-System			Non-Tenure System	TOTAL	% Tenure-System
	Tenured	Tenure Track	Total			
Fall 1987	952	249	1,201	102	1,303	92%
Fall 1988	951	246	1,197	95	1,292	93%
Fall 1989	949	227	1,176	95	1,271	93%
Fall 1990	933	200	1,133	95	1,228	92%
Fall 1991	942	159	1,101	77	1,178	93%
Fall 1992	933	130	1,063	89	1,152	92%
Fall 1993	943	148	1,091	81	1,172	93%
Fall 1994	936	154	1,090	84	1,174	93%
Fall 1995	896	156	1,052	94	1,146	92%
Fall 1996	906	151	1,057	107	1,164	91%
Fall 1997	883	163	1,046	108	1,154	91%
Fall 1998	846	169	1,015	125	1,140	89%
Fall 1999	865	174	1,039	122	1,161	89%
Fall 2000	859	172	1,031	124	1,155	89%
Fall 2001	833	186	1,019	133	1,152	88%
Fall 2002	736	176	912	141	1,053	87%
Fall 2003	738	182	920	151	1,071	86%
Fall 2004	705	212	917	183	1,100	83%
Fall 2005	710	244	954	188	1,142	84%
Fall 2006	713	248	961	196	1,157	83%
Fall 2007	712	260	972	201	1,173	83%
Fall 2008	700	275	975	205	1,180	83%

Notes: The table shown here is compiled by the Office of Institutional Research. It is updated annually, is presented in a campus fact sheet and is available at [http://www.umass.edu/oapa/publications/factsheets/employees/FS\\_emp\\_02.pdf](http://www.umass.edu/oapa/publications/factsheets/employees/FS_emp_02.pdf). Source is OIR faculty census file, October.

### Faculty Personnel Policies

- **Tenure-Track Faculty**

Personnel policies for tenure-track faculty are clearly articulated in the Board of Trustees [Academic Personnel Policy](#) and in the [Union Contract](#) between the University of Massachusetts Board of Trustees and the Massachusetts Society of Professors, the union representing UMass Amherst faculty. Both documents are provided to all faculty members when they are hired, and state law requires that all unions in Massachusetts advise members whenever a new union contract is negotiated.

The Trustees' [Academic Personnel Policy](#) and the [Union Contract](#) both establish clear criteria for appointment and reappointment to faculty positions ([Academic Personnel Policy](#), sections 4.4 and 4.5). The [Policy](#) also details regulations regarding both the length of appointment and notice concerning reappointment ([Academic Personnel Policy](#), sections 6.1, 6.2, 6.7). Criteria for promotion and award of tenure are also clearly articulated ([Academic Personnel Policy](#), sections 4.4, 4.6, 4.9, 4.11). Likewise, the [Policy](#) describes the

process for major personnel reviews ([Academic Personnel Policy](#), section 6.4). The *Policy* charges the deans and Provost to ensure “that general criteria and procedural standards are consistently employed” ([Academic Personnel Policy](#), section 3.6).

About 83 percent of UMass Amherst faculty hold full-time, tenure-track appointments, and 93 percent of full-time faculty hold doctoral or other appropriate terminal degrees (Table 5.2). Faculty responsibilities concerning instruction are described in the [Union Contract](#), Article 15, and in the [Academic Personnel Policy](#), section 5.2. Faculty roles in personnel procedures and in developing academic policies are described in the [Academic Personnel Policy](#), sections 3.1 and 3.3.

Table 5.2

**Degree Attainment of Instructional Faculty, Fall 2008**

Highest Degree	Full-Time		Part-Time		Total	
	No.	%	No.	%	No.	%
Doctorate or Other Terminal Degree	1,072	93%	111	55%	1,183	87%
Master's	62	5%	68	34%	130	10%
Bachelor's	15	1%	19	9%	34	3%
Other	5	0%	4	2%	9	1%
Total	1,154	100%	202	100%	1,356	100%

Includes instructional faculty in state-supported and Continuing and Professional Education Programs.

- **Contract Faculty**

Non-tenure track faculty are appointed to fulfill particular needs, especially in the area of instruction. Their contracts may be full-time or part-time within any one of the following ranks: lecturer, senior lecturer, senior lecturer II, clinical faculty, visiting faculty and research faculty. The extent of UMass Amherst’s employment of non-tenure track faculty falls within accepted practices among research universities nationally. In fall 2008, non-tenure track faculty composed about 17 percent of total full-time instructional faculty at UMass Amherst (See Table 5.1). By comparison, non-tenure track faculty composed, on average, 22 percent of full-time instructional faculty at other public universities with “very high research” designations in fall 2008.

Criteria for the appointment of full-time and part-time contract faculty, as well as their roles and responsibilities, are described in the Trustees’ [Academic Personnel Policy](#), section 4.11. Recognizing the increased role of contract faculty at UMass Amherst – They now provide almost 30 percent of instruction – the campus administration and the faculty union negotiated and implemented new policies providing for multiple year contracts and promotion opportunities for lecturers ([Union Contract](#), Article 21).

- **Faculty Salaries and Benefits**

Salaries and benefits for UMass Amherst faculty are negotiated with the faculty union, the Massachusetts Society of Professors. Salaries for tenure-track faculty are slightly lower than those at peer institutions (Table 5.3). Yet UMass Amherst remains sufficiently competitive to attract and retain a highly qualified faculty, partly because current benefits are, in most cases, generous by national standards, as described in the [Union Contract](#), Article 27.

Table 5.3

Faculty Salary Comparison Among Peer Institutions  
Fall 2008

Institution	Professor	Rank	Associate Professor	Rank	Assistant Professor	Rank
University of Massachusetts Amherst	\$ 117,104	9	\$ 89,738	5	\$ 68,222	10
Indiana University-Bloomington	\$ 118,409	8	\$ 82,299	8	\$ 71,066	9
Iowa State University	\$ 109,736	10	\$ 81,589	9	\$ 71,394	8
Rutgers University-New Brunswick	\$ 135,190	1	\$ 92,946	2	\$ 74,622	3
Stony Brook University	\$ 126,539	6	\$ 92,233	3	\$ 71,566	7
University of California-Santa Barbara	\$ 128,452	4	\$ 77,837	10	\$ 74,021	4
University of Colorado at Boulder	\$ 119,856	7	\$ 88,648	6	\$ 75,140	2
University of Connecticut	\$ 133,017	3	\$ 91,837	4	\$ 73,913	5
University of Delaware	\$ 127,730	5	\$ 86,780	7	\$ 73,632	6
University of Maryland-College Park	\$ 133,416	2	\$ 94,881	1	\$ 83,433	1
University of Nebraska-Lincoln	\$ 107,396	11	\$ 74,802	11	\$ 65,366	11
<b>Peer Median</b>	<b>\$ 127,134</b>		<b>\$ 87,714</b>		<b>\$ 73,773</b>	
<b>Peer Mean</b>	<b>\$ 123,974</b>		<b>\$ 86,385</b>		<b>\$ 73,415</b>	

Source: IPEDS Staff Survey, Fall 2008

- **Faculty Responsibilities**

While UMass Amherst faculty have various responsibilities, as described in the faculty [Union Contract](#), Articles 11-15, they center on the three mission-related areas of teaching (including curriculum development); research, scholarship and creative activity, as appropriate to the faculty member's discipline; and service to society, the community of scholars, and the campus. The latter includes the essential responsibility to participate in the shared governance of the university, and to fulfill a host of leadership and administrative roles related to the teaching and research enterprises. Specific aspects of faculty responsibilities are described below.

- **Instructional Workload**

Like most research universities, UMass Amherst does not specify teaching loads for tenure-track faculty. General workload expectations are specified in the [Union Contract](#), Article 15. The Office of Academic Planning and Assessment and Office of Institutional Research track all instructional activity by funding unit and instructor type. Comparative data are provided across campus units. In addition, UMass Amherst participates in the National Study of Instructional Productivity, known as the [Delaware Study](#), which provides benchmarks by discipline for instruction at comparable public research universities. All of these data are used in regular assessment of faculty workload, and in allocating instructional resources. All faculty members participate in a Periodic Multi-Year Review, in which possible adjustments in workload distribution may be negotiated. Overall student-faculty ratios at UMass Amherst are comparable to those at peer universities, and these are reviewed regularly; the campus monitors, on a discipline-by-discipline basis, how it compares with peer institutions. When discrepancies have been identified, the campus has added faculty to bring its student-faculty ratios and instructional workloads more in line with peer institutions.

- **Faculty Evaluation**

Faculty members are evaluated annually by their peers and appropriate academic administrators. The criteria and procedures for the annual evaluation are laid out in the [Union Contract](#), Articles 33 and 21A.4. Faculty members are also reviewed for consideration for merit salary increases whenever such increases are available,

as described in the [Union Contract](#), Article 26.4. Tenured faculty members participate in a post-tenure review known as Periodic Multi-Year Review, as described in the [Union Contract](#), Appendix A.

- **Faculty Conduct**

The Board of Trustees has established various policies concerning faculty conduct, which include a [Code of Professional Ethics for the Faculty](#), a policy for responding to allegations of [scholarly misconduct](#), a policy on conflict of interest in research and [scholarly activity](#), and a policy on [consulting and outside activities](#).

- **Faculty Grievance Policies**

The Board of Trustees has issued policies that provide faculty members the right to discuss with appropriate administrative officials the reasons for any negative decisions ([Academic Personnel Policy](#), sections 5.1f, 5.1i and 6.10). The faculty [Union Contract](#), Article 25, also provides a grievance process that begins with a mandatory attempt at informal resolution and that may culminate in binding arbitration.

- **Graduate Teaching Assistants**

Graduate teaching assistants provide approximately 11 percent of the instruction offered at UMass Amherst. Under the terms of the contract with the graduate student employee union, all graduate teaching assistants scheduled to teach for the first time at the University are required to attend an orientation session offered by the [Center for Teaching](#) or by their department.

### **Faculty Development**

To enhance the quality of instruction and research on campus, faculty members are provided with various opportunities for professional development, including sabbatical leaves, access to research and educational support funds, and a variety of support services. [The Office of Faculty Development \(OFD\)](#) delivers such support with a wide range of services and resources. The OFD assists new and under-represented faculty in developing and advancing their careers, particularly as they work toward tenure and promotion; supports activities that showcase the experience and expertise of faculty at every stage of the career; and provides opportunities for faculty dialogue, development and renewal. The OFD collaborates and co-sponsors programs with a variety of campus units, and with Five Colleges Inc. Specifically, the OFD offers:

- **Orientation information for new faculty**, delivered at established and regularly scheduled events. The OFD also provides comprehensive information and resources on grants, mentoring, scholarly writing, tenure preparation, work-life balance, benefits, diversity, pedagogy, teaching technologies, course registration and resources for researchers.
- **Strong support for scholarly writing and research productivity**, provided at writing retreats, with an Online Faculty Writing Fellowship, and in the Faculty Writing Space in the W.E.B. Du Bois Library. A Faculty Writing Grant program will begin in 2009-10.
- **Mutual mentoring programs**, which encourage pre-tenure faculty to develop robust professional networks that include partners on and off campus. These programs are supported by the Mellon Mutual Mentoring Team Grant Program and the Mellon Mutual Mentoring Micro-Grant Program.
- **Campus-wide professional development seminars**, held each January to expose faculty to a diverse array of career-enhancing information, strategies and techniques. Recent seminars have focused on issues such as: balancing demands of teaching, service and research; and understanding the current academic publishing landscape.
- **Discipline-specific tenure and promotion preparation seminars**, offered with individual academic units. Presentations include information about the purpose and procedures of tenure; advice from a chair and members of the personnel committee; strategies and experiences of near peers. The OFD also offers a campus-wide workshop on promotion from associate to full professor.

- **Campus leadership programming**, administered on behalf of the Chancellor and the Chancellor's Junior Faculty Fellows Program to foster an exchange of ideas between the central administration and promising early-career faculty. Beginning in 2009-10, the OFD will assume responsibility for the Leadership Enhancement for Academic Departments (LEAD) Program, previously offered by the Provost's Office. This year-long program develops and supports faculty chairs and heads, and prepares the next generation of academic leaders on campus.

## Appraisal

As stated in the [Framework for Excellence](#), individual faculty members can no doubt improve their effectiveness as teachers and scholars. Yet overall number is the most important challenge UMass Amherst faces regarding faculty. Compared to public research universities at the rank to which the campus aspires, UMass Amherst has too few faculty members. This relative dearth of faculty resources, especially on a campus with no medical school, means it will be difficult to improve rankings in faculty awards and in other prestigious recognitions from external agencies.

Given the 20-year erosion in faculty numbers shown in Table 5.1, the *Framework for Excellence* proposes strategic faculty increases when economic and budgetary conditions allow. The campus embraces the numerical goals of [UMass Amherst 250](#), the planning initiative completed in 2005. It aimed to increase the size of the UMass Amherst tenure-system faculty to 1,200, a benchmark representing campus strength in the late 1980s. This complement of tenure-system faculty would allow UMass Amherst to make more gains as a nationally competitive public research university working to achieve its full potential in teaching, research and service. The campus again aims for that benchmark: Faculty growth is a top priority in campus planning, even as budget exigencies might force position eliminations in the short term. When UMass Amherst has budgetary means, the campus will proceed to increase faculty size with an eye toward strategic initiatives. Instructional needs are important, but cannot be the sole factor in deciding where to allocate new positions. Wherever a faculty position is granted, the campus will want to consider the return in terms of teaching, research and service. Despite current economic challenges, UMass Amherst understands that instructional strength – and the research and scholarship produced by tenure-system faculty – are central to the UMass Amherst mission and to its ambitions as a flagship research university.

Faculty-development activities are important to the University's teaching, research and service mission and have been fostered through the Office of Faculty Development (OFD). In 2008-09 alone, the OFD sponsored 21 programs for faculty across career stages and disciplines, supporting 744 total participants. The OFD also distributed \$128,320 in grant funding through its Mellon Mutual Mentoring Team Grant and Micro-Grant Programs. A total of 173 UMass Amherst faculty participated in the projects sponsored by these 12 team grants and 15 micro-grants. Combined with a wide range of services to the UMass Amherst community – including resources and programming to support orientation, mentoring, tenure preparation, scholarly writing, and a work-life balance – the professional development opportunities at UMass Amherst provide significant support for the advancement and continued productivity of faculty.

Regarding personnel policies, the UMass Amherst faculty have in place multiple, specific policies to address the full spectrum of personnel issues. These policies are articulated in the University of Massachusetts Board of Trustees [Academic Personnel Policy](#) and in the [Union Contract](#) between the University of Massachusetts Board of Trustees and the Massachusetts Society of Professors, the campus's faculty union. Personnel policies are updated as needed. The term of the *Union Contract* is determined in negotiations, however contracts typically cover three years; the current contract covers fiscal years 2009-2011.

### *A Focus On: Attracting Promising Faculty*

*A focus on attracting promising faculty has sparked new campus policies and practices that appeal to young scholars. The aim is to help faculty attain career success, while also balancing work and family. UMass Amherst has developed a comprehensive set of family-friendly policies, including generous parental leave, child-care opportunities, and a strong emphasis on meeting the needs of spouses who also are pursuing academic careers. To maximize the success of early-career faculty, the campus has launched a pilot program that offers a “research intensive semester” to untenured faculty in the Humanities and Fine Arts. The University has adopted a new, more flexible, sabbatical leave policy and is studying ways to further broaden sabbatical opportunities without significantly increasing costs. And it offers expanded mentoring and other forms of faculty development. In these ways, UMass Amherst is a leader in developing policies and practices that resonate with today’s young faculty. The campus is connecting with faculty values – and building an important competitive edge.*

### **Projection**

In the next decade, UMass Amherst will proceed to increase the size of the faculty, according to the [Framework for Excellence](#). The timing of these investments relies in large part on revenue recovery, including revenue from increased student enrollment. Net growth in the size of the faculty is therefore targeted toward the middle and later years of the planning period. The new Provost and Senior Vice Chancellor for Academic Affairs will work with deans and the central administration to address this important issue. As the campus continues to adapt to its changing circumstances, it will continue to rely on close cooperation with the Faculty Senate and faculty as a whole.

The following considerations will assist the campus in maximizing investment in new faculty:

- A recently issued Request for Proposals outlined the strategy the campus will employ for hiring a significant portion of its faculty in the next decade. The RFP calls for proposals from groups of faculty interested in a specific area of research and teaching and asked them to make requests for faculty to augment their activities. Among other criteria, these requests will be evaluated according to the possibilities for securing external funding, the promise of establishing UMass Amherst as a center of excellence for the specific activity, and the strengths that currently exist on the campus in that area.
- Because the campus recognizes the corresponding need for a robust program of capital construction over the next decade, UMass Amherst will coordinate plans for hiring faculty with the overall campus long-range building plan. The campus will likely have to delay the addition of faculty until additional operating funds are received, but in that time will make headway completing several new or renovated facilities to house these new faculty members.
- Other campus units likewise will coordinate activities with hiring plans. Development will be able to present opportunities for donors to invest in the future of promising fields of research and teaching; admissions will seek to attract students to the new and exciting programs being implemented; and communications will begin to advertise our national prominence in areas of excellence on campus and to build coalitions with key constituents to improve on the current level of excellence.
- The administration must do more to support faculty achievement and excellence and to build structures to assist faculty success in obtaining research grants, in winning additional faculty awards, and in gaining recognition for innovative and effective teaching and scholarship. The goal in administration must be centered on supporting an increased level of faculty accomplishment in these areas.

The Office of Faculty Development (OFD) continues to expand its services to faculty at all career stages. Looking ahead, the OFD plans to: program additional customized tenure and promotion preparation

seminars; re-launch a leadership development program; continue to examine the intersection between work-life balance and professional success; offer more programming in support of scholarly writing and productivity; and expand mentoring services to post-tenure faculty, particularly for targeted audiences seeking to improve scholarly productivity.

## **II. Teaching and Advising**

### **Description**

Teaching and advising are core components of the campus mission, and UMass Amherst is committed to ensuring their effectiveness and continued improvement. Students have opportunities for varied instructional experiences, including lectures, discussions, labs, seminars, and field experiences. Increasingly, these opportunities are supported by technology, either within the classroom or through online homework or instruction. The campus focus on instructional and advising effectiveness is addressed through instructional development opportunities, institutional support for teaching innovations, and evaluation activity that monitors effectiveness.

### **Instruction**

The [Center for Teaching](#) (CFT) provides support for teaching and offers opportunities for professional development for faculty. CFT programs address both subject-specific and general features of teaching excellence: How faculty stimulate inquiry, generate knowledge, and present information are content-driven; general features of good teaching – such as establishing and communicating clear learning objectives, actively involving students in learning, and evaluating performance in ways that accurately reflect goals – are common to all disciplines.

CFT emphasizes developmental (formative, voluntary) consultation and program services. The greatest effort is devoted to consultation with individual faculty members to identify what is going well in their teaching and what might merit attention. The consultation process is a voluntary, confidential and collaborative effort.

Instructional support services offered at the Center include: print, video and web-based resource materials, including a monthly newsletter on teaching; consultations individually or in groups; classroom-based observation and feedback; and the Midterm Assessment Process (MAP). The MAP provides student feedback while the course is in progress. Unlike the standard end-of-semester course evaluations, MAPs are conducted around midterm to allow the instructor to make meaningful changes during the semester. Many instructors use the assessment as a way to begin a dialogue with students about course content and successful learning strategies and as a tool for examining their own assumptions about teaching and learning.

The Office of Academic Planning and Assessment (OAPA) offers a broad range of programs and tools to help individual faculty members and department chairs use evaluation to improve teaching. These tools include the Student Response to Instruction (SRTI), the campus's systematic course-evaluation system. SRTI includes both formative items, related to best instructional practices, and summative items, composed of three items that address students' overall evaluation of the course and instruction. The SRTI was developed through a collaboration of OAPA, the Center for Teaching, the Faculty Senate Council for Teaching, Learning and Technology, and on- and off-campus measurement experts. OAPA advises faculty and departments on the appropriate use of SRTI results in promotion and tenure decisions ([A Guide for Using SRTI Results to Inform Merit, Promotion, and Tenure](#)); this includes a revised reporting system that provides instructors and departments with comparative results. The Center for Teaching helps instructors develop strategies to respond to student feedback from SRTI.

A range of recognition and development programs is available to instructors. Teaching development programs span the faculty career and include: the Lilly Teaching Fellows, pre-tenure; TEACHnology Fellows, post-tenure; Teaching & Learning in the Diverse Classroom Fellows, all ranks; General Education Fellows,

post-tenure and long-term instructors; and the Grants for Teaching Innovations program, associated with post-tenure, periodic multi-year review. Recipients model best practices in instructional effectiveness in undergraduate education. The Center for Teaching also sponsors an annual campus-wide mini-grant program, called Faculty Grants for Teaching, which is open to all instructors. Recognition programs include two juried awards: the college-wide Outstanding Teacher Award, and the campus-wide Distinguished Teaching Award.

Much of the recent UMass Amherst effort to improve instruction has focused on effective use of instructional technology. Academic Computing, in the Office of Information Technologies (OIT), and the Center for Teaching provide support to faculty in the uses of technology, while most fully online teaching support is provided by Continuing and Professional Education (CPE).

For 10 years the Center for Teaching has offered its TEACHnology program, which emphasizes the use of technology for teaching improvement. In 2008, in conjunction with the campus-wide review of General Education (See Standard Four), a new [General Education Fellows Program](#) was created to improve the use of technology in General Education courses. General Education instructors are provided with coaching and technical support as they redesign their courses.

Applications of instructional technology have outpaced the physical infrastructure. In 2004, the Provost created an [Instructional Technology Task Force](#) to determine needs and to set an agenda for improving infrastructure and support. The Task Force proposed a multiyear plan that resulted in significant improvement: About 85 percent of the university's classrooms – all with more than 40 seats – have been outfitted with at least a basic instructional technology package. The newest campus building, the Integrated Sciences Building, has state-of-the-art instructional technology in all its rooms. The campus now has a regular program to provide computers to faculty who need them.

The integration of technology to support instruction has been further advanced with the development of the [Learning Commons](#) and the Teaching Commons. The Learning Commons opened in fall 2005 and was an immediate success. On the main floor of the W.E.B. Du Bois Library, the Learning Commons provides a central location for technology support from professional staff and trained student assistants 24 hours a day, five days a week. Dozens of laptop computers are available for checkout and use in the library, supplementing 120 computer stations. Multimedia stations are being developed to support students using more advanced instructional technology. In addition, the Learning Commons provides short learning tutorials on popular software through a subscription to [Atomic Learning](#). The Teaching Commons opened in summer 2009, providing a place for faculty to work with teaching experts, instructional technology student assistants, librarians and colleagues. It extends the services provided at Academic Computing, the Center for Teaching, Continuing and Professional Education and others in a central spot atop the W.E.B. Du Bois Library.

The campus continues to innovate and improve its use of instructional software and services. The UMass Amherst learning management system, called SPARK, now allows final course grades to be automatically uploaded to the Registrar. The student information system, called SPIRE, supports a customized grade-book feature created by campus technical staff. The Office of Information Technologies (OIT) has also created online photo rosters to help instructors better identify and personally interact with their students. UMass Amherst created its own Online Web-Based Learning system (OWL) for content delivery and online homework. This system is used extensively on campus, and has been adopted internationally, especially in chemistry. OIT has linked OWL and SPARK so students do not need to visit two separate sites to do their coursework, and instructors receive automated roster support.

The campus is a leader in the use of hand-held Personal Response Systems, widely known as “clickers,” in classrooms across campus. UMass Amherst began using Personal Response Systems in the mid-1990s and has now standardized products, services and support; instructions for use are available online. The number of instructors using these devices has grown steadily, as faculty seek to promote active learning that engages students, particularly in larger class settings.

## **Advising**

Academic advising traditionally has been decentralized, with each academic unit organizing services for its students. Typically, each department has a faculty member who serves as Chief Undergraduate Advisor. In some departments, especially those with relatively small numbers of majors, faculty members are assigned an advising caseload to provide most academic advising support. In some larger departments, professional advisors augment faculty and handle aspects of course registration and other high-volume activities. Professional schools have tended to organize centralized, professionally staffed advising operations, especially for lower division students. Students without declared majors comprise the largest single student cohort. They receive advising support from a team of professional staff and experienced graduate student advisors in the office of [Undergraduate Advising](#) (UA). This is a central advising unit within [Undergraduate Advising and Learning Communities](#) (UA&LC). It is organized to support and transition these students into degree-granting units as quickly as possible.

Each school and college also has a designated undergraduate dean who is responsible for monitoring students' academic progress; rendering judgments on student petitions for exceptions to academic policies; and overseeing probation, suspension, and other aspects of academic discipline. A high priority is placed on identifying and assisting students who are academically at-risk.

Generally, advising is organized around a series of registration events focused on course scheduling. Incoming students connect with representatives from their schools and colleges at the start of the [New Students Orientation](#) prior to the beginning of their first semester on campus. They learn about degree requirements and course options, and complete schedules for their first semester. Students also access ongoing assistance with course scheduling during designated registration periods each semester.

Students entering without declared majors are encouraged to enroll in OASIS, a one-credit, first-year seminar designed to address the needs of this population. The seminar is taught by advisors in Undergraduate Advising and partners across campus. In it, first-year students are introduced to the academic programs, services, resources and opportunities available at on campus, and are guided through a variety of exercises and activities designed to assist them in identifying academic majors that match their interests and abilities. A primary component of this course is the work students do during mandatory individual meetings with their academic advisors.

Students benefit to varying degrees from personal relationships with faculty and professional advising staff. Motivated students are likely to find the support they need. Yet there is no single set of advising expectations and relationships across the campus.

## **Appraisal**

UMass Amherst has made a substantial and long-term investment in supporting highly effective teaching. Throughout its 20 years on campus, the Center for Teaching (CFT) has been generously funded by a range of internal sources, including the Offices of the President and Provost, as well as collaborative ventures with schools and colleges. The CFT also has been successful in securing some external funding, from sources including the Hewlett Foundation and the Fund to Improve Post Secondary Education (FIPSE). The CFT has a strong reputation on campus and nationally, and provides a range of services to support instructors.

Instructional innovation is a hallmark of the faculty. In recent years, UMass Amherst faculty have been awarded grants from the Fund for the Improvement of Postsecondary Education, the Pew Charitable Trusts, the Davis Educational Foundation and the National Science Foundation to support efforts to improve instruction and enhance student learning on the campus. Many innovations, including use of Personal Response Systems and the Online Web-Based Learning homework system, have been adopted across campus. Microsoft Corp. named UMass Amherst its first IT Showcase School after the Learning Commons opened in

the W.E.B. Du Bois Library in fall 2005; the designation highlighted UMass Amherst excellence in the use of information technology to advance higher education.

In the past five years, UMass Amherst has undertaken a systematic examination of academic advising practices and has taken steps to make the process more coherent, predictable and effective. Much of this work has been undertaken in conjunction with efforts to improve student retention. This analysis was informed by two sources of research: national research into student development, success and retention, which consistently highlights the importance of the quality of the first-year experience; and UMass Amherst’s own investigations into the effectiveness of students’ early experiences on campus.

UMass Amherst’s research identified several important themes ([UMass Amherst Research on the First-Year Experience: Summary of Findings](#)): the quality of advising; the extent to which the campus environment emphasizes studying and academic work; the quality of relationships with administrative personnel and offices; and satisfaction with the educational experience ([National Survey of Student Engagement](#)). In addition, students who left the university after their first year often cited anonymity and lack of personal attention as factors in their decision ([UMass Amherst Non-Returner Survey](#)). One of the major challenges to improving the effectiveness of advising is to achieve greater success in student use of services. Another is the articulation of a university-wide mission that shapes and fosters a more coherent and consistent approach to advising across units ([UMass Advising Survey](#)).

An ongoing First-Year Task Force (FYTF), appointed by the Provost and the Vice Chancellor for Student Affairs and Campus Life, has evaluated first-year programs across campus, with a strong focus on academic advising. The Task Force identified a shift that must occur to provide more positive experiences and outcomes, as described in Table 5.4.

Table 5.4

Current Model	Desired State
<b>Laissez-faire</b> <ul style="list-style-type: none"> <li>• Burden is on student to seek and find help</li> <li>• Weak “ownership” of advisees</li> </ul>	<b>Intentional</b> <ul style="list-style-type: none"> <li>• Set and enforce expectations</li> <li>• Establish clear responsibilities and hand-offs</li> </ul>
<b>Reactive</b> <ul style="list-style-type: none"> <li>• Students “below the radar” until problems arise</li> <li>• Resources concentrated at end of relationship</li> <li>• Most coherent component: academic discipline</li> </ul>	<b>Anticipatory</b> <ul style="list-style-type: none"> <li>• Place students on productive paths</li> <li>• Emphasize prevention</li> <li>• Rapid response</li> </ul>
<b>Distributed and Fragmented</b> <ul style="list-style-type: none"> <li>• Each unit on its own</li> <li>• No common expectations</li> <li>• No consistent assessment and quality assurance</li> <li>• Highly variable resources, services</li> <li>• Many components, but poorly articulated</li> <li>• Wide and numerous cracks</li> </ul>	<b>Distributed and Coordinated</b> <ul style="list-style-type: none"> <li>• College-centered</li> <li>• Common framework, diverse implementation</li> <li>• Focus on commonalities, differences in FYE</li> <li>• “Leveling up”</li> <li>• Visible and effective coordination</li> </ul>
<b>Weak Accountability</b> <ul style="list-style-type: none"> <li>• High demands on students, weak monitoring</li> <li>• Timely intervention very difficult</li> <li>• Feedback loop, self-correction weak</li> </ul>	<b>Strong Accountability</b> <ul style="list-style-type: none"> <li>• Improve monitoring tools</li> <li>• “Front load” resources</li> <li>• Transparent, comprehensive assessment</li> </ul>

**Note:** Adapted from Preliminary Report of the First-Year Task Force, 2007.

This thinking resulted in a new approach to the first year with several key components. The essential feature is that the campus’s diverse programs and services will organize themselves around the academic goals and progress of the student. The student’s academic plan and advising relationship form a foundation for services, such as residential programs, ongoing orientation, and extra-curricular opportunities ([Components of the First-Year Experience](#)). To permit this kind of coordination, the Task Force developed a “roadmap” for the first year based on six milestones strongly related to academic success ([Six Contact Points for First-Year Advising](#)). This framework establishes the sequence and timing of the core academic plan, and therefore the

basis for aligning residential programs, co-curricular opportunities and other support services to that plan. To date, the new approach to the first-year experience has resulted in several major changes:

- [Undergraduate Advising and Learning Communities](#) (UA&LC) has assumed broader campus-wide responsibility for coordinating first-year advising, starting with the advising services offered during the New Students Orientation.
- The campus has invested in staff to strengthen first-year programming. This investment includes the addition of a full-time Director of Undergraduate Advising for the UA&LC, and establishment of the Academic Advising Link in the W.E.B. Du Bois Library Learning Commons, which is staffed by peer academic advisors.
- The campus is implementing a formal, college-based advising model. The professional schools are sharpening their focus on the first-year roadmap, and the arts and sciences colleges, which had been operating a legacy combined advising unit for academic discipline, are developing comprehensive college-based advising organizations roughly parallel to those of the professional schools. The new units will develop coordinated strategies for advising across departments, and will emphasize success in the first year as a key ingredient to increased retention and degree completion.
- UMass Amherst is making a commitment to first-year seminars. There are currently three basic models: the “intro to college/basic college success topics”; the faculty model, which is designed to give students an early connection to faculty mentors; and seminars that are connected to Residential Academic Programs (RAPS). UA&LC designed and teaches the OASIS First-Year Seminar, a one-credit seminar designed to address the needs of students entering UMass Amherst without declared majors (Described above).
- The First-Year Task Force is introducing the roadmap approach to all the agencies involved in first-year programming, and is beginning the process of aligning services. An early priority is coordinating first-year residence hall programming with the advising model (See Standard Six).

## **Projection**

UMass Amherst faces a challenge in maintaining teaching excellence in the face of competing demands on faculty time, especially as instructional faculty numbers have declined and the campus has faced a financial crisis. Even so, teaching and advising remain central aspects of faculty responsibility. Advising, in particular, has been the focus of improvement efforts as the campus continues to prioritize student needs and success.

A major instructional effort in the next year will involve implementation of General Education reforms, including a transition from three-credit to four-credit courses (See Standard Four). This proposal (currently awaiting Faculty Senate approval), will ask instructors to revise their Gen Ed courses to the four-credit model, with the first wave of courses available for first-year students entering the University in fall 2010. The coming year will also require careful planning to preserve the effectiveness of the instructional program as the campus responds to large shortfalls in state appropriations.

In terms of instructional technology, most attention in the short term will be focused on design of a new academic and classroom building. Working with Burt Hill, a global architecture and engineering firm, the campus is developing guidelines for technology and learning spaces that will support emerging teaching needs and best practices. These standards will guide not only design of the new building, but also ongoing improvements to existing teaching spaces.

The priorities for academic advising are to continue implementation of the first-year roadmap and to ensure the successful transition to college-based advising. In turn, the improvements in advising and first-year curriculum will be coordinated with the campus’s more aggressive enrollment planning (See Standard Six).

### III. Scholarship, Research and Creative Activity

#### Description

UMass Amherst is distinguished by its designation as a research university with “very high research activity” (RU/VH) from the Carnegie Foundation for the Advancement of Teaching – a sign of prestigious scholarly projects and a notable benchmark as the flagship campus strives for recognition as a top-tier public research university. Research, scholarship and creative activity not only are integral to the UMass Amherst mission as the state’s land-grant campus, but also are an underpinning of all education and outreach functions. As the campus creates and transmits new knowledge, it prepares students to meet complex challenges ahead while also boosting quality of life and contributing to a robust economy for the benefit of people in our commonwealth, nation and world. Scholars themselves embody lifelong learning as they deepen their expertise during the course of research – and this contributes to a vital circle of new knowledge when scholars engage with students and collaborators. For these reasons, research, scholarship and creative activity are fundamental expectations for UMass Amherst faculty.

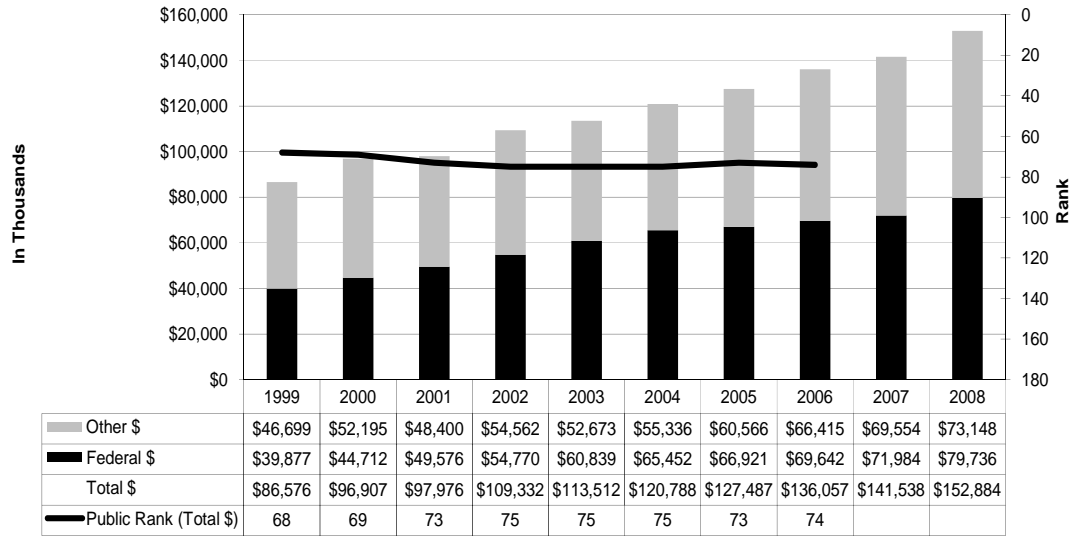
Indeed, the prestige of UMass Amherst rests, to a great extent, on the research and creative activity conducted here. As Chancellor Robert Holub made clear in a Nov. 28, 2008, memo to the campus Budget Planning Task Force, “(T)he greatness of a campus is usually correlated closely with its research productivity.” Whatever form this work takes – articles, books, conference presentations, patents, paintings or performances – the recognition faculty scholarship receives within each of the disciplines adds to the reputation of the whole institution and is a critical factor in advancing UMass Amherst, its students, partners and many other constituents.

Indicators of research, scholarship and creative activity reveal a steady rise in research activity in the past decade. UMass Amherst research expenditures – the productivity gauge used for national comparisons – have climbed steadily in the past 10 years for projects sponsored by both federal agencies and other sources. In fiscal year 2008, total campus research expenditures reached a high of nearly \$157 million, of which \$153 million were in science and engineering, as shown in Figure 5.3. That was a 76 percent increase in a decade. Just over half of those expenditures derived from federal sources. The National Science Foundation (NSF) was the single greatest source of federal funds, indeed of all sponsored funds ([\*Sponsored Activities Annual Report for Fiscal Year 2008\*](#)).

However, even with rising research expenditures, UMass Amherst’s national ranking among public research universities has remained fairly flat (Figure 5.3). The campus was positioned among the top 75 public research universities based on total science and engineering expenditures in 2006, the most recent year for which national comparisons are possible. Among all research universities, public or private, UMass Amherst ranks 107 for total research expenditures. (Dollars are adjusted for single-campus institutions if information for that campus is reported to NSF as part of a multi-campus or university system.)

Figure 5.3

Science and Engineering Research Expenditures (in thousands)  
FY 1999 - 2008



Source: The Top American Research Universities 2008 Annual Report

In another indication of activity, total research expenditures per tenure-system faculty were \$156,804 for fiscal year 2008, an increase of 16 percent from fiscal year 2004 (Table 5.5).

Table 5.5

Research Expenditures per Full-Time Equivalent Tenure-System Faculty  
Fiscal Years 2003-04 through 2007-08

	2004	2005	2006	2007	2008
Total	\$135,064	\$138,049	\$142,468	\$146,368	\$156,804
Federal	\$73,188	\$72,386	\$72,847	\$74,441	\$81,781

Notes: Includes all tenure-system instructional faculty except those in administrative positions of dean and above. FTE is reported as an academic year average.

### Research Facilities

During the past decade, some key research facilities have been built or substantially renovated. This has fostered growth in some UMass Amherst research programs. Newly constructed or renovated facilities in the past 10 years include: the Animal Care Facility, the Computer Science Building, Engineering Lab II, the Integrated Sciences Building, Morrill Science Center Fourth Floor, Skinner Hall, the Studio Arts Building and the UMass Recreation Center. These facilities are among those described in the [2007 UMass Amherst Building Condition Report](#) as “our best buildings,” although the report notes an overall dearth of high-quality research facilities.

## **Administrative Support**

The [Office of the Vice Chancellor for Research and Engagement](#) supports the pursuit of UMass Amherst research and scholarly activities. The staff aims to enable the translation of student and faculty work into social, economic, technical and environmental advances – and to increase campus capacity for research, scholarship and innovation by fostering relationships between faculty and the institutions that sustain their work.

Leading the Office is a newly named Vice Chancellor, whose direct reporting line to the Chancellor – recently re-established – signals an increasing emphasis on research and the goal of advancing UMass Amherst into the top tier of public research universities. The research office had reported directly to the Chancellor, then moved to the Provost’s purview from 2004 to 2008; the chief officer’s title was Vice Provost for Research during that time. In 2008, the position became Vice Chancellor for Research and Engagement, reflecting the reinstatement of a reporting line and an expectation of close collaboration with all vice chancelleries. With this configuration, the Vice Chancellor has greater authority to implement procedures and policies that enhance the campus’s research profile and assist faculty in securing outside sponsored research. As the title suggests, the Vice Chancellor also focuses on interdisciplinary research activities to compete for more lucrative federal grants, and will promote more partnerships with communities, industry and other collaborators.

Five units now report to the Vice Chancellor for Research and Engagement, indicating the scope of administrative support for research and scholarly activity:

- Research Affairs – responsible for providing information services and training that promote the use of external sponsorship. This includes Grant and Contract Administration, which is responsible for the review, processing and submission of proposals to external sponsors; for negotiations and execution of awards; and for post-award oversight of grants and contracts. Also within this unit are Compliance services for human and animal subjects, which help ensure that research is conducted ethically and in accordance with the complex regulatory environment. The unit also administers internal grant programs.
- Commercial Ventures and Intellectual Property – responsible for technology transfer: evaluating, protecting and commercializing the inventions and discoveries of academic researchers on the Amherst campus, including oversight of spin-off companies based on UMass Amherst intellectual property. The unit assists faculty, staff and students in securing sponsored research funds to transform ideas, inventions and creative works into commercially viable products, processes and services with economic payback to the inventors, the sponsors and the university. This office started [UMass Amherst TechCast](#), a podcast series spotlighting high-potential UMass Amherst technologies available for licensing.
- Research Liaison & Development – responsible for supporting faculty in large interdisciplinary research with economic-development potential, and for managing industry partnerships. The office also handles research communication and marketing, publishing a monthly e-newsletter, [Research ACCESS](#), and an annual printed report, [Report on Research](#). The office was established in 2005 with the merger of two former units, Economic Development and Strategic Technology Alliances. It reflects a growing focus on collaborative research activities, particularly with industry and state partners.
- The Environmental Institute – provides a central coordinating structure to encourage and support collaborations across colleges and disciplines in environmental research and education. The unit develops connections through a number of interdisciplinary initiatives, including Environmental Working Groups and an Environmental Lecture Series each semester.
- University Press – the book-publishing arm of the University of Massachusetts. Its mission is to publish first-rate books, edit them carefully, design them well and market them vigorously. In so doing, it supports and enhances the university’s role as a major research institution.

The Office of the Vice Chancellor for Research and Engagement works with two established and complementary forums to encourage communication among and between UMass Amherst research faculty and administrators: the Deans' Research Meeting, convened five times per academic year, gathers all deans and associate deans for discussion about campus research; the Faculty Senate Research Council meets monthly during the academic year to help shape policy, provide guidance and review internal grant programs.

Among promotional efforts started or enhanced, the Office of the Vice Chancellor for Research and Engagement in 2004 expanded the annual campus event recognizing research accomplishments and eminent scholars; the event honors high-achieving faculty with several awards. [ScholarWorks@UMass Amherst](#), administered by UMass Amherst Libraries, is a digital showcase of campus research and scholarly activity. ScholarWorks both archives and highlights faculty scholarship, even offering a *Paper of the Day*.

UMass Amherst Libraries is another important asset to help advance research and scholarly activity (See Standard Seven).

### **Research Policies, Compliance and Ethics**

UMass Amherst works to create an environment in which research is conducted responsibly. The Office of the Vice Chancellor for Research and Engagement maintains a repository of relevant policies and guidance related to research. Among the categories covered are: Cost Accounting Standards; Financial and Budgetary Policies; Health and Safety Policies; and Investigator, Ethics and Attribution Policies. [These policies](#) are accessible online and are introduced during campus orientations for new faculty. In addition to these policies, the research Compliance staff provides crucial information on regulations and issues regarding Animal Use, Biological Safety, Human Subjects, and Responsible Conduct. [Information and updates](#) are available online. Detailed training is offered to faculty based on research focus and requirements. The [Faculty Senate Research Council](#) provides critical input for developing new campus research policies; the Council also helps review and maintain currency of existing policies.

### **Appraisal**

#### **Notable Strengths and Gains**

Faculty have been honored for eminent scholarship in disciplines including Afro-American studies, chemical engineering, computer science, electrical and computer engineering, food science, linguistics, microbiology, sociology, speech-language pathology and polymer science. Strengths have been leveraged in some cases into nationally and internationally recognized research in areas of societal importance, such as biofuels, clean-energy economics, computer networking, materials science and nanotechnology. With its disciplinary strengths and scientific synergies, UMass Amherst is poised for advances in both basic and applied research – and will deliver new knowledge and innovations to meet society's challenges in key interdisciplinary areas. Life sciences and renewable energy, two broad interdisciplinary areas, are the focus of strategic research activity for the campus.

Large interdisciplinary research projects have emerged at a quickening pace on campus, reflecting the scope and complexities of society's challenges. Significant federal funding and robust collaborations are yielding UMass Amherst centers and institutes with potential for breakthrough research in areas of national priority. These programs build upon competitive strengths in the campus research enterprise.

To capitalize on interdisciplinary discovery and sponsorship opportunities, the Office of the Vice Chancellor for Research and Engagement is working to assist scholars in building research projects into long-term programs supported by substantial funding and involving new partnerships on campus and elsewhere in academia, government and industry. Interdisciplinary work – marked by multiple co-principal investigators from different departments – is now featured in the [Sponsored Activities Annual Report](#) to highlight and encourage this work. The UMass Amherst [Advanced Energy Portal](#) represents easily accessible online

information meant to connect researchers and collaborators – in this case offering information about campus researchers working on advanced energy issues in the areas of harvest, use, conservation and impacts. The [UMass Amherst BioPortal](#) serves a similar purpose for life sciences.

UMass Amherst has some 80 centers and institutes conducting long-term research in often interdisciplinary programs. Of these, 10 are national centers and institutes, which are federally funded and focus on national research priorities, such as energy and the environment (<http://www.umass.edu/research/nationalcenters.html>). A few notable UMass Amherst centers and institutes, which illustrate this trend, include:

- A new [Energy Frontier Research Center](#) (EFRC) will be established at UMass Amherst with recently announced sponsorship from the U.S. Department of Energy. The center has the potential to draw more than \$16 million over five years. A major focus will be creating and testing new polymer-based photovoltaic structures for the conversion of sunlight into electricity. In particular, materials that self-assemble naturally at the molecular and nanoscale level will be sought to optimize performance. The center strengthens the campus's role as a national leader in clean energy research ([UMass Amherst Emerges as a National Leader in Green Research](#)). More information is available at <http://www.umass.edu/loop/talkingpoints/articles/88321.php>.
- The Engineering Research Center for [Collaborative Adaptive Sensing of the Atmosphere](#) (CASA) supported by the Engineering Research Centers Program of the National Science Foundation. Established in 2003, CASA is a \$40 million enterprise over 10 years that involves multiple academic institutions and dozens of companies. CASA researchers are working to revolutionize the ability to observe, understand, predict and respond to hazardous weather events. The departments of Electrical and Computer Engineering and Computer Science lead the endeavor, which includes significant partnerships with other institutions, the private sector and government agencies. Massachusetts has invested \$5 million; these first-of-a-kind research matching funds helped secure NSF sponsorship.
- The [Center for Hierarchical Manufacturing](#) (CHM), a National Science Foundation Nanoscale Science and Engineering Center awarded in 2006. The NSF will invest \$36 million over 10 years to study nanoscale manufacturing – the tools and processes for fabricating engineered nanoscale materials and particles, and assembling and integrating them into larger-scale structures, devices and systems. Massachusetts has invested \$7 million. The CHM operates under the umbrella of [MassNanoTech Institute](#), the campus-wide initiative for nanoscale science and engineering. Dozens of faculty investigators from multiple colleges and departments are working in the field of nanotechnology, with granting from a variety of federal and industry sources. Ongoing efforts include licensing of key technology, acquisition of specialized characterization equipment, and the education and training of talented graduate students. MassNanoTech provides a single point of contact for collaborators.
- The UMass Amherst [Materials Research Science and Engineering Center](#) (MRSEC), repeatedly supported by the National Science Foundation. The Center builds on a tradition of excellence in multidisciplinary research in polymer science and engineering and is notable for education and outreach activities. UMass Amherst is home to the longest running MRSEC in the country; the center was established in 1974 as a Materials Research Laboratory.

Consistent with the mission to deliver the impact of research and scholarship, there has been acceleration in UMass Amherst technology disclosures, licensing agreements, patent activity and start-up companies in the past decade, particularly in the past five years. These gains in technology transfer are significant as indicators of campus innovations with high potential to boost both quality of life and economic development, even as they yield financial returns to scientists and campus. UMass Amherst has worked to build an infrastructure that supports technology transfer: In 2005, a Director of Commercial Ventures and Intellectual Property joined the Research office after the position had been unfilled for several years; two new licensing associates subsequently joined the staff. Subsequently, numbers of disclosures, patent applications and awarded patents have increased, as shown in Table 5.6.

Table 5.6

**Intellectual Property**

	2004	2005	2006	2007	2008	2009
Invention Disclosures	30	28	37	45	56	60
Patent Applications Filed	20	13	26	32	33	27
Patents Issued	7	5	8	13	9	12
Licenses Executed	15	20	8	5	14	20
License Revenue (in thousands \$)	\$543	\$666	\$1,330	\$562	\$697	\$861

UMass Amherst intellectual property also has jump-started several new companies in recent years. Some examples:

- In the advanced energy sector, Qteros, formerly SunEthanol, and Anellotech both use novel technologies to develop biofuels. Qteros, in round B of venture capital funding, is founded on technology developed by Microbiology Professor Susan Leschine, which uses a microbe to convert plant matter into ethanol. The company is headquartered in Marlborough. Anellotech, using technology developed by Chemical Engineering Assistant Professor George Huber, is working with a chemical catalytic process to convert cheap biomass into environmentally friendly biofuels, or “green gasoline.”
- In food sciences, Wesfolk Corp. was incorporated in 2008 to commercialize a portfolio of work by UMass Amherst researchers, including three Food Science professors, Eric Decker, D. Julian McClements and Yeonhwa Park. The company works with advanced encapsulation technology with potential application for the beverage industry; Wesfolk’s work is based on research that is expected to lead to production of conventional higher-fat foods that are digested as if they were low-fat.

UMass Amherst recently has engaged with the Commonwealth of Massachusetts and a variety of community partners to launch initiatives that advance research while stimulating economic development. For instance, the Greater Springfield – UMass Amherst Partnership Team, which also involves the Governor’s Office and the UMass President’s Office, seeks to bolster Springfield with “green economy” and “creative economy” programs linked to the campus’s arts and advanced energy expertise. The Pioneer Valley Life Sciences Institute, a partnership between the campus and Baystate Health, combines UMass Amherst life sciences research expertise with clinical expertise at Baystate Medical Center in Springfield to better position the partners for discovery and sponsorship opportunities. Since its founding in 2002, the Pioneer Valley Life Sciences Institute has attracted more than \$20 million in sponsored activity; it employs about 40 people in the city of Springfield.

Representing even greater potential, UMass Amherst is connecting on concrete ways with the recently established Massachusetts Life Sciences Center (MLSC), which is the nucleus of a \$1 billion Massachusetts investment package enacted in 2008 and meant to position the commonwealth as a global leader in life sciences research and economic activity. UMass Amherst already has benefitted from MLSC research and faculty awards; the campus is forming plans for a major life sciences research center that would significantly boost investigations and strengthen ties to the MLSC.

A challenge is presented in telling the story of scholarship that is not reflected in sponsored-activity data. As the Chancellor has made clear in the *Framework for Excellence* and other planning documents, the scholarship of faculty working in the humanities, fine arts and social sciences is essential to the vitality of UMass Amherst, and to the prominence of its scholarship and research enterprise particularly. As a whole, this work is more difficult to quantify than that which more typically receives federal sponsorship. At the writing of this Self-Study, the campus was awaiting the latest *National Research Council Assessment of*

*Research Doctorate Programs*; this assessment will help UMass Amherst broadly appraise the standing of its scholarship enterprise.

Undergraduate research is a highlight at UMass Amherst. The campus hosts nearly a dozen [Research Experience for Undergraduates \(REU\)](#) programs. Each year, the programs provide about 150 talented undergraduates with summer research experiences under the tutelage of campus scientists in a variety of fields; sponsors include the National Science Foundation, Howard Hughes Medical Institute and the UMass Amherst Office of the Provost. The campus also hosts the annual [Massachusetts Statewide Undergraduate Research Conference](#), which highlights the work of some 500 students attending UMass Amherst and other institutions. These well-established programs represent campus efforts to prepare students starting at the undergraduate level with rigorous and exciting training; this is essential for professional success, and helps create a pipeline of high achievers for work in academia, government and industry.

### ***Striving for Improvement***

Data and activities demonstrate a productive and high-quality research enterprise at UMass Amherst. These indicators also suggest significant room for improvement in the coming decade. UMass Amherst's overall goal is to advance as one of the top public research institutions in the country because of the important role research plays in fulfilling the campus mission. To appreciably improve its national research ranking, UMass Amherst will need to more than double its share of federal research expenditures, the standard for nationwide comparisons. Such a level of research productivity will be difficult to attain during a 10-year period, but UMass Amherst must move strategically to realize significant advancement.

Increasing faculty engagement in research is central to increasing the campus research profile, as discussed in the [Framework for Excellence](#). That means adding tenure-system faculty; orienting faculty replacement hires in appropriate departments toward better-funded research areas; and increasing research activity among current faculty. The budgetary environment limits the campus's ability to grow the faculty in the short term; faculty growth will be a point of emphasis as new resources become available.

It also will be essential that the campus identify appropriate and adequate sources of funding for faculty startup needs. Startup expenses vary by discipline and area; the campus's approach has been to make competitive offers, generated at the department and college level. Funding for startup has been shared with contributions from department, college or school, and central budgets. Replacement hires provide a near-term possibility to increase research activity. However, in the case of junior faculty hires, research return on investment typically is not realized for three to five years. Increasing research activity among established faculty is difficult, but should be part of an overall strategy.

Facilities are another crucial factor for a robust research enterprise. Here, UMass Amherst faces a particular challenge. While some facilities to support research have been constructed or renovated in the past decade, the campus needs other modern research-intensive facilities to advance its research enterprise. Complaints about inadequate facilities stand out in a faculty survey recently conducted by the Collaborative on Academic Careers in Higher Education (COACHE) at the Harvard University Graduate School of Education. The [COACHE Survey Results](#) were presented on campus in February 2009. Adequate facilities are integral to world-class research, whether because such facilities enable growth in established and emerging programs, or because these facilities help attract talented new faculty. Indeed, deans with departments in the laboratory sciences, particularly the physical and biological sciences, find it increasingly difficult to compete for promising new faculty because campus facilities for laboratory science and engineering have not kept pace ([UMass Amherst Building Condition Report](#)).

Research support services, which assist faculty in translating ideas into funded grants and contracts, constitute a third important factor that must be improved to build the campus research enterprise. The need for improved research support – including assistance identifying funding opportunities, proposal preparation, travel funds, and more time for research – likewise strongly emerged in the [COACHE Survey Results](#)

presented in February 2009. In addition to appraisal of and improvements in its own programs, the Office of Research and Engagement has begun training programs for college and department staffs, to provide more faculty support for proposal preparation in those units.

## Projection

The [\*Framework for Excellence\*](#) outlines several strategies to help UMass Amherst advance into the top tier of public research universities nationwide. Strategies for improvement are interconnected and fall into the categories of research sponsorship, faculty research activity, research facilities and administrative support. A newly appointed Vice Chancellor for Research and Engagement will help guide campus research services and other aspects of the research enterprise.

- Faculty growth will remain a high priority and a driver as new budgetary resources become available. It is essential to reverse the declining trend in tenure-system faculty if the flagship campus is to strive ahead as a public research university. Without sacrificing teaching quality, research productivity potential will be an emphasis in new faculty hires in appropriate fields.
- The campus will seek to continue – and intensify – its upward trend in successful pursuit of larger grant opportunities, particularly federal sponsorships. Much of this effort will aim to leverage research strengths in life sciences and advanced energy.
- A more robust research enterprise also will require identifying and obtaining research funds from additional sources, including the state and industry. To facilitate connections with industry, the campus must act quicker and more nimbly in negotiations. The campus also seeks more expertise to establish long-lasting and mutually productive relations with industrial partners. The possibility of industrial partnership space in new science buildings will be pursued.
- The international arena also is a potential source of more sponsored research funding. International research can be more expensive to secure and conduct, but the campus will work to expand international opportunities for faculty.
- The Office of the Vice Chancellor for Research and Engagement will work with the Office of Government Relations to identify opportunities for faculty funding, especially in the federal government arena, and in developing more specific plans to actively support faculty to receive grants from state and federal agencies. This effort must be systematic and must be regularly evaluated for effectiveness. Similarly, the Development office must work closely and effectively with Research to take full advantage of industrial partnerships and foundation funding opportunities.
- As research activity continues to improve, an increase in post-doctoral appointments will be possible; this will further accelerate research activity. The campus aspires to increase by 50 percent its average annual post-doctoral appointments, which have averaged 160 for the last few years.
- UMass Amherst is in a strong building cycle, but research facility needs are so great that relief will be neither quick nor widespread on campus. Close coordination between academic planning and facilities planning is required to prioritize building projects. The campus also will continue facilities planning with an eye to positioning the campus for more large federal grants when appropriate.
- The Office of Research and Engagement must become more efficient and effective, and likely will grow as research activity increases. New programs will be established and old programs retooled to improve administrative support; appropriate procedures and technologies that help meet this objective.
- A new, more flexible sabbatical leave policy, set to begin in fall 2010, will support scholarship and research activity, as described above; a comparative analysis of sabbatical systems might lead to further enhancements for faculty at UMass Amherst.
- The “research intensive semester” pilot program, also described above, will specifically support faculty in the Humanities and Fine Arts.

## IV. Outreach

### Description

UMass Amherst Outreach <http://www.umass.edu/outreach> engages the university with the community on a range of economic, social, cultural, environmental and educational issues. Outreach applies the teaching, research and knowledge resources of the university to benefit the public. In so doing, Outreach supports the university's public engagement and land-grant mission and its responsibilities to the Commonwealth of Massachusetts, facilitating greater productivity for the commonwealth. A key milestone for UMass Amherst – and an indicator of Outreach success – was the campus's January 2009 Community Engagement designation from the Carnegie Foundation for the Advancement of Teaching. The campus marked this milestone with a new publication, *Portraits of Community Engagement*, which highlights programs that exemplify UMass Amherst efforts to engage with partners and people throughout the state.

Use of the word “outreach” in an academic context is relatively recent, but the concept can be traced to the origins of public universities. In creating “land-grant” universities, the federal Morrill Act of 1862 described the nature of the beneficiary as a kind of student different from those of the private institutions of the time. The Morrill Act supported “one college where the leading object shall be ... to teach such branches of learning as are related to agriculture and mechanic arts ... in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.” By fostering Outreach, UMass Amherst continues to fulfill its mission as a land-grant university.

At UMass Amherst, Outreach activities have been organized in two basic ways.

On one level, the Division of Outreach administered five established units that foster community connections and directly deliver knowledge. These units are: Continuing and Professional Education; University Without Walls; UMass Extension; public radio station WFCR; and the Arts Extension Service. These Outreach units provide innovative lifelong learning programs for adults regardless of ethnicity, occupation or socioeconomic status. The academic, credit-based programming units offer more than 30 degree or certificate programs at the undergraduate or graduate level, and some 16,000 students enroll in more than 1,200 courses.

On another level, Outreach efforts are part of the fabric of UMass Amherst: Faculty work in many off-campus collaborative partnerships that are alternately regarded as public service, outreach and community engagement. The university has more than 1,000 faculty-led projects impacting 280 communities throughout Massachusetts. As these numbers suggest, Outreach work infuses many academic functions: Schools and colleges have Outreach plans; many other campus academic units – such as centers, institutes and programs – facilitate external partnerships and conduct Outreach programs, often across disciplinary lines and departmental borders.

Following are the five established UMass Amherst Outreach units focused on external constituencies:

- [Continuing and Professional Education](#) (CPE) delivers UMass Amherst instruction to thousands of students on and off campus. This instruction takes the form of individual classes and academic programs at the undergraduate, graduate, professional development and certificate levels. Students enrolled through CPE include working professionals building their skills base, college students designing their own majors, and adults exploring specific areas of interest.
- [University Without Walls](#) conducts programs for adult learners seeking to complete bachelor's degrees. Instruction is delivered online, in a blended format, or through weeknight and weekend courses.
- [UMass Extension](#), part of the national Cooperative Extension System, addresses concerns of high public priority. It provides community-based statewide educational programs in Agriculture and Landscape, Natural Resources and Environmental Conservation, Nutrition Education, and Youth Development. These programs, often conducted in partnership with other organizations, offer research and educational opportunities including workshops, conferences, distance education, training events, consultations and applied research.
- [WFCR 88.5 FM](#) delivers National Public Radio news and music programming in western New England.

For more than 45 years, the station has been broadcasting to western and central Massachusetts, northern Connecticut, southern Vermont and New Hampshire. It provides news, information, music and cultural programs to about 200,000 listeners weekly. The station also is supported by Five Colleges Inc.

- The [Arts Extension Service](#), with sponsorship from the National Endowment for the Arts and the Massachusetts Cultural Council, supports the creative economy on a national level. It delivers professional arts-management education through workshops and training programs; an online certificate program in Arts Management; and an online bachelor's degree with a concentration in Arts Administration, the first of its kind in the nation. Arts Extension also publishes several arts management books and offers an array of customized conferences and training programs, as well as research services for state, regional and local arts agencies.

### **Appraisal**

As part of the UMass Amherst land-grant mission, Outreach units, programs and initiatives extend campus resources to enrich a broad range of learners, industries and organizations. Outreach programs provide platforms for community engagement, especially around issues of workforce and economic development. Outreach efforts foster significant partnerships between the university and external constituencies. The campus takes special pride in its selection in 2009 for the Community Engagement classification from the Carnegie Foundation for the Advancement of Teaching.

The [Faculty Senate Council on University Service, Public Service and Outreach](#), established in 2000, brings together faculty representatives to set a campus agenda for Outreach activities and to strengthen the fabric of Outreach on campus. The Council believes UMass Amherst is at a critical juncture in its relationship to the commonwealth. It works to improve delivery of campus expertise to constituents in the state, and to demonstrate the value of UMass Amherst to Massachusetts citizens.

### **Projection**

In spring 2009, the Task Force on Outreach Organization was formed to review the organization and administration of UMass Amherst Outreach. The Task Force considered how established Outreach units and other Outreach activities might be best aligned to achieve financial benefits and to strengthen ties to campus research and teaching. The ultimate aim is to continue developing Outreach programming that directly and significantly connects with the people and communities of Massachusetts.

At the writing of this Self-Study, the Provost was considering Task Force recommendations regarding the administrative organization of Outreach units. In the interim, the five units described above are no longer centrally administered by the Division of Outreach; most are instead aligned with related academic units. Determinations about permanent structure are forthcoming.

Looking forward, UMass Amherst Outreach programs will strengthen as the campus explores new ideas and re-examines existing practices to improve the development and delivery of education built on campus academic resources. A commitment to fiscal responsibility, responsiveness, innovative programming and a dedication to lifelong learning will continue to characterize Outreach efforts. Through collaborations and programs that reach across and beyond the university, the campus will strive to expand and extend the work of faculty to reach new audiences and to achieve broader impacts. Through technology and innovation, Outreach programs will contribute to the evolution of UMass Amherst as an accessible institution that provides a seamless and sustained set of learning opportunities in response to evolving needs of the commonwealth, its industries, communities and people.

In particular, increasing the university's market share of non-traditional learners, an expanding cohort, is a concrete step to cope with the declining numbers of high school graduates and to produce strong revenue growth for the academic community.

UMass Amherst will make strides with initiatives that engage community partners with mutually beneficial research, program delivery and economic development. Important partners will include the city of Springfield, the largest city in the region, the third-largest city in Massachusetts, and a city threatened by declines in its economic base. New collaborations in Springfield, described in the Scholarship, Research and Creative

Activity section of this chapter, will lead to development of other fruitful connections in the coming decade, particularly in the areas of creative economy and green industry development.

To further fulfill the UMass Amherst mission as a land-grant institution and to provide support for the commonwealth and its citizenry, the campus will work toward the following goals, as outlined in the *Framework for Excellence*:

- The campus will seek to establish a permanent office in Springfield to house numerous and varied initiatives in the areas of arts and educational programs, architectural assistance, and consultation in public health and nutrition. The office would coordinate and unify current initiatives and encourage faculty and students to engage in new projects to benefit the campus and the city.
- UMass Amherst will expand community and distance-learning programs with improvements in marketing, program development and services for adult and non-traditional students. These programs provide valuable revenues for the campus, as well as needed curriculum for students on the campus and for the growing population of students from around the country and the world who increasingly choose online and blended modalities for their education.
- The campus will seek to integrate its summer session into the campus academic plan in two ways: by using it to supplement curricular offerings available during the fall and spring term, and by exploring avenues to attract special groups of students to campus as part of revenue enhancement activities. UMass Amherst has a stock of buildings and student housing not being used effectively for three months of the year. A more effective summer session will solve problems resulting from oversubscribed courses by expanding the academic year and by providing the campus opportunities for income-generating programs. In addition, the campus location and involvement in the region's cultural life will be leveraged to create a campus summer life that is vibrant and meaningful to students and the region.
- UMass Amherst will seek to increase and enhance partnerships with the region's community colleges. These relationships will address improved recruitment and retention of students from those institutions and create expanded potential for positive experiences for adult students within our programs.

### **Institutional Effectiveness**

On a regular basis, UMass Amherst evaluates the sufficiency of and support for the faculty – as well as the effectiveness of the faculty in teaching and advising, scholarship, service, and research and creative activity. The evidence used includes external and comparative perspectives to provide the campus with comparative contexts for understanding faculty work. Evaluation evidence is used to improve policies and services related to faculty support and to inform allocation of instructional, research and other relevant resources.