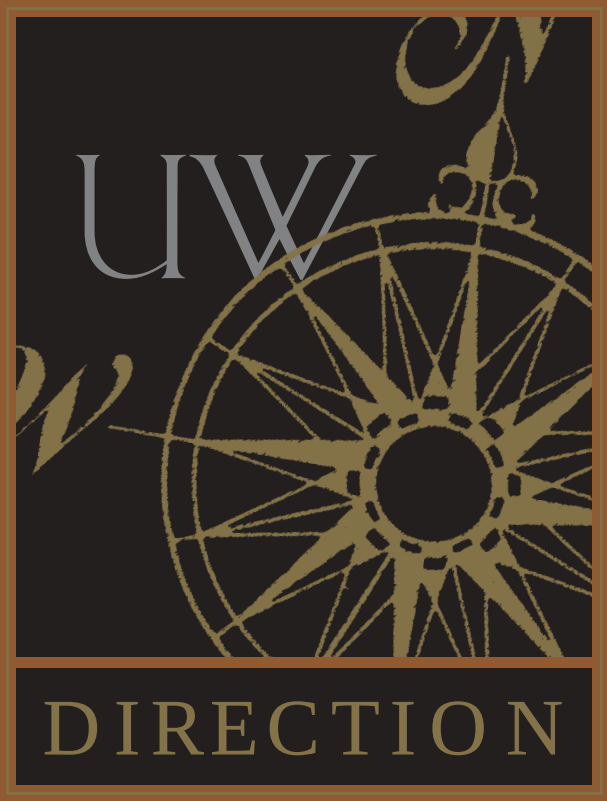


moving forward III

Table of Contents

MISSION

University of Wyoming Mission Statement

The University of Wyoming aspires to be one of the nation's finest public land-grant research universities, dedicated to serving as a statewide resource for accessible and affordable higher education of the highest quality, rigorous scholarship, technology transfer, economic and community development, and responsible stewardship of our cultural, historical, and natural resources.

In the exercise of our primary mission to teach and educate students, we seek to provide academic and co-curricular opportunities that will:

- *Expose students to the frontiers of scholarship and creative activity, and the complexities of an interdependent world;*
- *Ensure individual interactions among students, faculty, and staff;*
- *Nurture an environment that values and manifests diversity, free expression, academic freedom, personal integrity, and mutual respect; and*
- *Promote opportunities for personal growth, physical health, athletic competition, and leadership development for all members of the University community.*

As Wyoming's only university, we are committed to outreach and service that extend our human talent and technological capacity to serve the people in our communities, our state, the nation, and the world.

The primary vehicles for identifying the specific actions and resource allocations needed to achieve this complex mission are the University's Academic Plan, Support Services Plan, and Capital Facilities Plan, each revised periodically.

Introduction

A university is, above all else, a place to learn. The University of Wyoming offers outstanding learning opportunities to a broad constituency, to faculty members and students, in large and small classes, in art studios and science labs, in face-to-face encounters and across cyberspace, in Laramie, throughout the state, and beyond. There is no privileged setting, and there are few bounds on our modes of inquiry. There is, however, the responsibility to improve.

Academic planning guides and focuses the university's efforts to improve. *Moving Forward* serves both as a catalyst for institution-wide planning and as a guide to colleges, departments, and programs in developing unit-specific plans.

The following pages outline institutional areas of distinction and issues that we believe require attention in the *2004 Academic Plan*. Some issues are relatively simple; others are complex and far-reaching. Our approach has been iterative. In spring 2002, we distributed *Moving Forward I*, which sketched a set of broad issues and sought comment from the university community and our friends around the state and nation. After reviewing many thoughtful responses, we reconfigured some issues, reframed others, refined the scope of the discussion, and released *Moving Forward II*. In fall 2002, we once again engaged the campus community in debate and deliberation. The response to *MFII* has been overwhelming. The Office of Academic Affairs received hundreds of comments, criticisms, and suggestions for improvement. *Moving Forward III* reflects our reading and consideration of these comments. Some of the most insightful comments are not part of *MFIII* only because they are more appropriate to the college- or department-level plans to be developed in the months to come. All comments regarding either *MFI* or *MFII* are available for review on the Academic Affairs website[1].

Like its predecessors, this document identifies and frames important institution-wide issues that colleges, departments, and other academic units must address in their plans. While we always welcome comments and ideas related to academic planning, we do not intend to produce further iterations of *Moving Forward*. Rather, *MFIII*[2] is the final charge to academic units at all levels – including the central administration – to develop academic plans during the coming year. To guide this effort, *MFIII* contains not only an expanded and refined discussion of the issues identified in *MFII* but also timelines, protocols, and content requirements associated with department- and college-level academic plans.

The task ahead is a critical one for all who care deeply about the university's future.

Planning premises and principles

Undergirding the academic plan are five premises about the nature of the University of Wyoming and eight principles that shape the contours of the plan.

Planning Premises

Coherent planning requires an awareness of the institution's mission, its history, and the context within which it operates. We believe that the following premises reflect such an awareness:

1. The University of Wyoming's first priority is undergraduate education. Our most important job is to offer rigorous, up-to-date baccalaureate programs that cultivate lifelong learning and personal growth. UW offers a significant array of undergraduate academic programs that provide challenging, well-taught curricula and involve students in research, scholarship, and creative activity. As the foundation of undergraduate education, these programs require continued support and attention.

2. UW is a research institution of international standing. Maintaining and enhancing this stature is important for three reasons. First, scholarly advances are the natural products of unfettered learning and are central to the future of education. Second, vibrant research and graduate education are necessary to sustain the economic health of the state and region. Third, original research and creative endeavors are essential to the continuing professional development of UW's faculty, which in turn is essential to excellence in teaching.

3. As a land-grant institution, UW has a special commitment to promote liberal and practical education in the arts, humanities, sciences, and professions. This commitment colors decisions about which academic areas to emphasize, the instructional uses to which we dedicate state and federal resources, and the appropriate balance between theory and application in scholarship.

4. The land-grant mission also includes supporting the citizens of Wyoming with education, research, and service. The university must work with other agencies and institutions to strengthen the intellectual and cultural assets of the state and its citizenry.

5. As an academic institution in a free society, UW has other core commitments. These include broad access to advanced education; a diverse and international representation within our community and in our curriculum; tolerance and openness to different perspectives; and freedom of expression, inquiry, and open debate. Objective scholarship and free exchange of ideas are the hallmarks of American universities. The university must be devoted to the creation, transmission, and preservation of knowledge, pursued in a setting free from ideological intimidation.

Planning Principles

A plan is hollow unless it influences the institution's use of resources and its system of incentives and rewards. The following principles guide not only the *2004 Academic Plan* but also the resource allocation decisions required for its implementation:

1. Above all else, UW is an academic institution. All planning processes, resource decisions, and incentives, in every branch

of the institution's organization chart, must support and enhance UW's academic mission and our plan for accomplishing it.

2. Planning is a process, not an event. At UW the planning process is continual and cyclic. The written document that articulates UW's goals and the actions needed to achieve them will be developed every five years, but institutional planning is ongoing.

3. Effective planning requires active feedback from all sectors of the academic community. Neither top-down nor bottom-up planning alone is sufficient. There is no substitute for sustained communication and iterative refinement.

4. UW plans from a position of strength. The university has many excellent programs; talented and energetic faculty, staff, and students; and strong support from the state and federal governments. The challenge facing UW is to allocate its resources wisely, to advance our highest aspirations in education and scholarship.

5. Central to academic planning is a hard question: what areas will the university cultivate for distinction? The question is especially critical in a state university of our size, facing steady internal and external pressures to undertake more than it can afford to do well. Decisions about where to focus for distinction should guide the allocation of resources and the determination of which endeavors to aggressively support.

6. The pursuit of distinction is most effective when it furnishes opportunities for many members of the academic community to participate. By identifying areas of distinction and by reinforcing them with resources and incentives, we intend to avoid exclusive reliance on marquee departments to sustain the institution's reputation. Decisions about which areas to cultivate for distinction must be grounded in honest appraisals of where UW has already built a reputation for excellence, where student demand is sustainable, where existing faculty talent is ripe for enhancement, and where we can capitalize on the institution's unique location and context.

7. The university has some departments and programs that, for various reasons, are unlikely to attain national visibility in the near future. We recognize, however, that a department or program need not be destined for prominence to be essential to the university's mission and hence to merit support. This said, every academic unit stands to benefit by carefully considering ways in which it can align with and contribute to UW's areas of distinction.

8. Our efforts at institutional improvement have led us to dedicate all available resources to the university's mission. New initiatives therefore entail difficult decisions about redirecting resources. Willingness to make these decisions forthrightly, with vision and planning, is precisely what gives departments, colleges, and the institution the opportunity to shape UW's future.

Areas of Distinction

Rationale

As one of the nation's smallest public research universities, UW has committed itself to achieving excellence in a carefully defined set of academic areas. In identifying these areas of distinction, we acknowledge our finite resources, define our institution's aspirations, and help frame the planning discussions in colleges and departments.

It is not our intent to ignore areas that are integral to every university's mission; indeed, we clearly must maintain strength in academically central disciplines. Instead, we intend for UW's areas of distinction to serve as nuclei for department- and college-level planning, in the sense that they are sufficient in number and scope to allow most academic programs to build in at least some of the areas. We urge all colleges and departments to envision ways to contribute to these areas of distinction, both to refine their own long-range foci and to participate in the cross-disciplinary synergy that allows UW to compete with much larger institutions.

Areas of distinction are not icing on the cake, nor are they challenges to be addressed in some indefinite future, after other departmental needs have been met. Our strategy must be to meet basic needs in ways that advance these areas. The units that are most likely to prosper, both within the university and in international stature, will be those that are best able to align program-specific goals with UW's areas of distinction. Units that fail to do so risk intellectual isolation and diminishing support.

Following each area listed below is a brief summary of progress made to date as well as the directions proposed for the future.

Areas of Distinction

1. **Environment and Natural Resources (ENR).** UW has made great strides in ENR-related teaching and scholarship. While the School and Institute of Environment and Natural Resources (SENR and IENR) are centerpieces for this commitment, many mainstream disciplines — the biological and physical sciences, the social sciences, business, engineering, education, and law — are fundamental to teaching and research in this area. Since the *1999 Academic Plan*[3], we have added undergraduate and graduate degrees, provided base funding, strengthened external support through IENR, increased our development efforts, secured endowed chairs, found stable leadership, offered a forum to engage Wyoming citizens in ENR issues, and bolstered instructional and scholarly support via central position management (CPM)[4]. The successes of SENR and IENR owe much, not only to good planning and leadership, but more importantly to the efforts of key faculty members, departments and colleges.

   Successes notwithstanding, IENR remains isolated from significant segments of the faculty who possess ENR-related expertise. Although participating faculty members have made strong contributions, much greater integration between IENR and the faculty is needed if the institute is to attain the widespread recognition that we seek.

   There is much left to accomplish. Fertile connections between ENR and all of our academic colleges should be expanded, through further faculty involvement in ENR-related courses, research, and the ac-

tivities of IENR. Interdisciplinary expertise supporting sustainable agriculture, land resources, and rural communities requires further development. The Greater Yellowstone Ecosystem initiative offers opportunities for a more vigorous UW presence in what is arguably the world's most renowned ecosystem. Water, energy resources, parks, and pristine ecosystems have lasting importance to Wyoming and the nation, and it makes sense for appropriate disciplines to strive for national prominence in fields supporting the study and management of these critical resources.

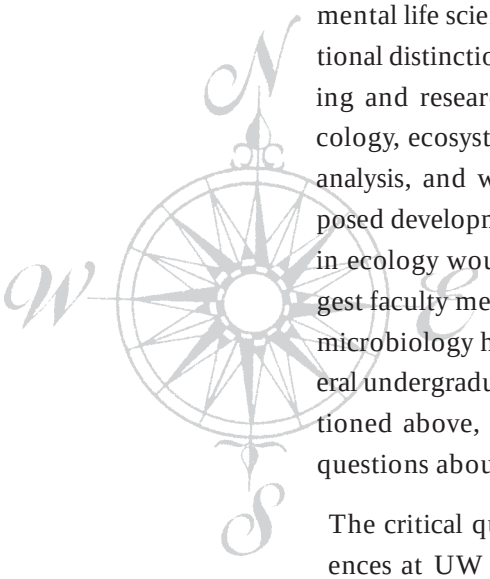
The task ahead includes other specific initiatives. After more than a decade of dramatic advances worldwide, UW has made little progress in developing interdisciplinary curricula and research in geographic information sciences (GIS) and in linking the various GIS initiatives that we now support. Initial discussions about earth-systems science have yet to yield an affordable strategy for an academic program that weaves together the earth and atmospheric sciences, ecology, and the social sciences. Environmental microbiology is another program that has yet to meet the needs of all stakeholders; we urge open discussion of the administrative configurations, curriculum, and faculty hiring needed to support this program, not only in Agriculture but also in Arts and Sciences, Health Sciences, and Engineering.

The institution's commitment to ENR is long-standing, and effective ENR-related bridges between teaching and scholarship already exist. Links between UW and K-12 teachers in this area furnish an excellent example; we encourage efforts to maintain and expand them. We also encourage increased coordination between ENR-related fields and International Programs. By focusing on ENR-related teaching and scholarship, UW has an opportunity to build further national and international prominence in an area in which it already enjoys a distinct competitive advantage.

2. **Life sciences.** One outgrowth of the *1999 Academic Plan* was the articulation of a vision for the life sciences, with which ENR has important overlaps. The life sciences constitute one of UW's historic strengths as well as a foundation for other facets of the university's mission. In our view, these disciplines have unrealized potential for even greater distinction. The strategy outlined in the Life-Sciences Report[5], based on interdisciplinary focus areas, appears to have broad support among life-science faculty. Implementing it will require commensurate support from deans and department heads, articulated through appropriate academic plans.

   The existing life-science foci are disparate in scope and maturity. Some are well funded, span several colleges and academic departments, and enjoy a stable core of research-productive faculty. Two exemplars are reproductive biology and neuroscience. But there are other areas worthy of emphasis. Cellular, molecular, and developmental biology are important components of teaching and research at UW, and they are central to modern biology. Owing in

Areas of Distinction



part to UW's ideal location, the environmental life sciences already enjoy international distinction, with outstanding teaching and research in environmental toxicology, ecosystem analysis, stable isotope analysis, and wildlife biology. The proposed development of a graduate program in ecology would link some of the strongest faculty members on campus. Finally, microbiology has clear importance to several undergraduate programs, and, as mentioned above, there are still unanswered questions about its structure.

The critical questions about the life sciences at UW concern the identification and support of a workable number of interdisciplinary focus areas. The task of identifying these areas falls naturally to the faculty members who have expertise; the task of support falls to department heads and deans, including the Dean of the Graduate School. We urge all of these stakeholders to develop a realistic vision for the configuration of interdisciplinary graduate focus areas in the life sciences.

3. **Critical areas of science and technology**. This area of distinction, encompassing materials and computational science, has clear relevance to engineering, agriculture, science, and business departments. Several units have traditions of strength in these areas. Materials science, including emerging molecular-based materials science and other biotechnologies along with such established fields as materials testing and computational materials science, provides fertile ground for research in several departments in engineering and the physical and life sciences. Computational science has an even broader compass. A reconfigured Computer Science department and a new computer-engineering curriculum are among UW's more visible accomplishments since the *1999 Academic Plan*. Among the older computational fields that deserve strengthening and newer ones that deserve more thought by appropriate departments are GIS; computational fluid mechanics; computational geosciences; computational physics and chemistry; information sciences, telecommunication, and networking; biomedical sciences; computational biosciences; and bioinformatics.

   In our view, lasting interdisciplinary ties are essential to overcoming fluctuations in strength that have historically hindered UW's advancement in this area of distinction. We envision a robust community of materials and computational scientists and engineers at UW, spanning several disciplines and providing a permanent basis for internationally competitive research and high-caliber undergraduate and graduate programs. The potential benefits extend far beyond the university's campus: judiciously structured outreach and technology transfer in these fields can help nurture the economic development of the state and region.

4. **Professions and issues critical to the region.** Professions and issues critical to the region are best viewed from an integrated perspective. Core professions in several colleges are important to developing and maintaining a workforce that can provide vision and leadership for Wyoming and the Mountain West. This

area of distinction has implications beyond the confines of formal degree programs: educators, engineers, business leaders, health-care professionals, and legal experts all require continuing professional education and the lifelong development of cross-disciplinary knowledge.

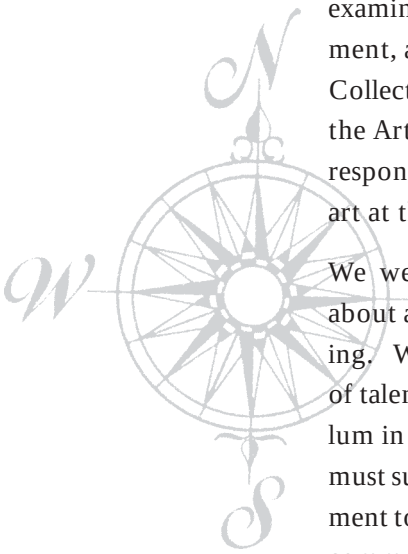
The needs also extend beyond UW's campuses. Owing in part to their rural setting, many communities in Wyoming need assistance with sustainable development, objective policy research, teacher training, leadership development, legal services, health-care delivery, ranching, mineral and energy production, and business assistance. The university's role in education is especially illustrative. UW has a natural leadership role in professional development and statewide articulation with the community colleges and other sectors of the educational system, both to address the growing shortage of secondary teachers in critical subjects and to build a more rigorous, seamless P-16 system. UW has a clear interest in promoting strong, prosperous, educationally rich communities, not only for the economic and social well being of the region but also for the opportunities that they create for our graduates.

UW plays a pivotal role in economic development. As a research university, it is an idea generator and creative force that not only expands knowledge but also stimulates entrepreneurship. This creative and entrepreneurial role bridges the institution's three central missions — teaching, research and public service — and links the university with the economic life of the state and nation.

5. **Statewide leadership in cultural endeavors, the arts, and the humanities.** UW must continue to cultivate distinction in the humanities and visual and performing arts. The undergraduate programs in these fields are excellent, and student interest continues to grow. Strategic faculty hiring, recent enhancements to infrastructure, and more stable funding for the performing arts and cultural outreach have allowed the university to play a significantly stronger role since the *1999 Academic Plan*. Continued support in these areas is essential if UW is to maintain its position as the state's leader in the arts and humanities. External funding has allowed some of the performing arts groups to tour the state, but more support – possibly through greater interaction with organizations like the Wyoming Council for the Humanities and federal agencies – would allow greater outreach.

   UW's Art Museum, the American Heritage Center (AHC), and the University Libraries, all under new leadership, have pivotal roles to play in advancing this area of distinction. We urge these units to explore further avenues of cooperation, to promote even more vigorous contributions to UW's academic life, and to increase outreach to the state and region. One useful measure would be to develop a unified plan, perhaps in cooperation with non-UW cultural agencies, to improve and focus the preservation and documentation of UW's collections. We

Areas of Distinction



recommend that the AHC and Libraries examine the future definition, development, and administration of the Hebard Collection. Similarly, the time is ripe for the Art Museum and the AHC to clarify responsibility for and administration of art at the university.

We welcome the current discussions about a degree program in creative writing. We already have a significant core of talented faculty and an active curriculum in this field. At the same time, UW must sustain an institution-wide commitment to writing, critical thinking, and oral communication across the disciplines, in both undergraduate and graduate programs. We urge all academic departments to help forge new curricula and new modes of teaching and learning, among UW faculty and educators statewide, and to stress these important skills among all Wyoming students.

6. **The history and culture of Wyoming and the Rocky Mountain region.** UW has considerable momentum in this area. Anthropology has built an exemplary program, adding faculty, expanding its library holdings, and implementing a new Ph.D. program in Paleoindian archaeology. We have a long-standing commitment to American Indian history and the history of the American West. The Libraries' Hebard Collection is the world's premier collection of Wyoming-related documents, and the AHC has a distinguished tradition of outstanding collections related to the American West. UW can improve its stature as a center for study in this area of distinction. We encourage humanities and social-science departments to develop courses and scholarship related to the diverse populations (American Indians, Basque-Americans, Hispanic-Americans, Asian-Americans, and various religious groups, among others) that still help to shape the region's culture.

We urge the AHC, as one of the nation's finest academic archives, to expand its outstanding work in curricular support, to continue to focus its unique collections, and to enhance its presence as a national forum for scholarly discourse. The AHC should also take a leadership role not only in regional efforts to expand the popular reach of historical collections but also in university-level efforts to stay abreast of archives technology and access in the digital age.

This area of distinction transcends the temporal bounds of human history. Our heritage includes the development of Wyoming's landscape in geologic time, the vast paleo-archives of the ecological and evolutionary history of life in the region, and our native biota. This heritage has influenced human activities and economies, both historic and prehistoric, and it has shaped our current culture and economy. It defines the backdrop for our future.

Institutional Issues

One of the core purposes of *Moving Forward* is to highlight a set of institution-wide challenges that require attention at all levels in the *2004 Academic Plan*. The issues described below have evolved in large measure from the *1999 Academic Plan*. Based on comments we have received, and consistent with progress made over the last few years, we have refined and reorganized the list, combining, recasting, and adding some issues while trying to preserve continuity. Following each topic listed below is a brief assessment of progress and a sketch of ideas for further implementation.

The Learning Environment

UW's fundamental mission is to provide outstanding opportunities for learning. Three aspects of the learning environment deserve careful thought:

- The assessment of student learning
- Personalized, connected education
- An Academic Success Center.

Assessment of student learning

The essence of a distinguished university is a sustained, ever-evolving commitment[6] to learning. Assessment of student learning plays a critical role in cultivating this distinction. It guides course sequencing, promotes effective articulation across the curriculum, showcases truly excellent teaching, and identifies practices that need improvement. We owe it to students and the public to understand, document, and improve the learning that takes place under UW's aegis. This rationale, not the mandates of accrediting agencies or political pressures, properly motivates our professional interest in assessing educational effectiveness.

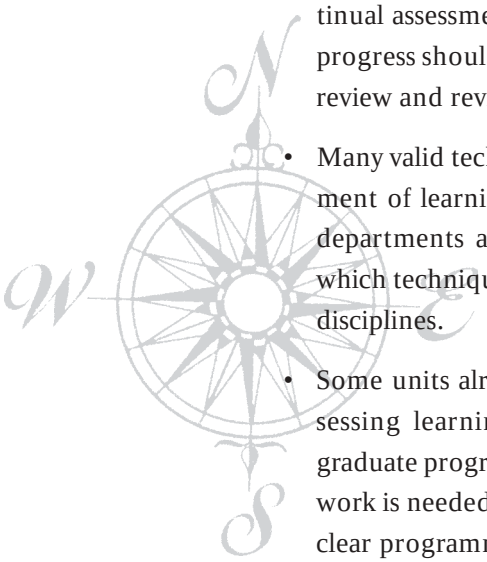
It also calls for action: every academic program must have in place an effective plan for the assessment of student learning.

Virtually all American universities find assessment a challenging task. Assessment is difficult because of the tension between individual practice and institutional coordination. Professors know from experience that the assessment of student learning is continuous, intertwined with other facets of teaching, frequently difficult to measure and often more difficult to document. We spend much of our professional careers adapting individual courses and teaching methods in response to students' success. These activities are important, but they are not sufficient. We have not uniformly identified the learning goals for the major, nor have we routinely assessed the aggregate learning in the courses required for the major or for the University Studies Program (USP)[7]. Our challenge is to systematize, document, coordinate, and respond at the department, college and university levels.

In line with UW's 2000 self-study for institutional reaccreditation[8], we recognize the following principles:

- A comprehensive assessment program has three components: 1) assessment at the level of the program and its overall curriculum, 2) individual student assessment, and 3) a faculty culture committed to student learning, supported by appropriate institutional acknowledgment and rewards.

The Learning Environment



- Clear, explicit learning goals; their continual assessment; and documentation of progress should form the basis for regular review and revision of the curriculum.
- Many valid techniques exist for the assessment of learning. Faculty members and departments are best able to determine which techniques are appropriate for their disciplines.
- Some units already have methods for assessing learning in undergraduate and graduate programs. For others, additional work is needed — typically in articulating clear programmatic learning goals, in refining and systematizing data collection, and in maintaining short- and long-term follow-through and reporting.
- Good assessment yields better learning, not cumbersome administrative protocols.
- Peer institutions can be a useful resource. Some already may have attained recognition as leaders in assessment; others may help clarify UW's aspirations, either institutionally or in specific disciplines.
- The assessment of lifelong learning presents special challenges because of our graduates' varied career trajectories. For this reason, longitudinal assessment of post-baccalaureate success is perhaps best done at the university level.
- Although satisfaction surveys may be informative, by themselves they fail to provide authentic evidence of learning corroborated by performance.
- It is inappropriate to use data gathered for department- or university-level assessment to evaluate the performance of individual faculty members or students.

The mechanism for documenting assessment already exists. Academic departments and programs currently produce annual updates for their respective deans[9]. The assessment of student learning is a key element of these updates. By paying regular attention to this element, department heads and program directors can minimize the work involved in compiling the cumulative assessment reports required for accreditation.

Finally, UW has yet to develop a comprehensive plan and reliable instruments for assessing USP. Student satisfaction surveys, as currently used, furnish only a rough gauge, and they are inadequate in assessing true learning outcomes. We challenge the Faculty Senate USP Committee to take the lead in exploring appropriate assessment techniques for the USP, guided by the College Assessment Coordinator Team and the Ellbogen Center for Teaching and Learning (E-CTL).

Personalized, connected education

One of UW's distinctive assets is the capacity to offer personalized, connected education in a nationally recognized research university. While this potential spans the institution, to date our successes have been fragmented and often narrow in scope. We can do better.

The concept of learning communities is fundamental to this effort. The Honors Program is perhaps the most outstanding example, having attracted some of UW's brightest incoming students and, through undergraduate research opportunities, close faculty mentoring, and small challenging classes, having instilled hundreds of undergraduates

with a keen sense of scholarly purpose. We have not consistently offered such opportunities to all students. The USP Intellectual Community (I) seminar courses now furnish platforms from which academic units can broaden the reach of UW's learning communities, stimulating scholarly engagement among all first-year students. Several models of first-year learning communities already exist[10]: Freshman Interest Groups, Engineering Power Groups, and Project Synergy are examples. We encourage all departments and colleges to explore these and other models that advance students' access to learning communities.

The effectiveness of any learning environment hinges on students' readiness. UW has developed learning communities for students at varying levels of readiness, but existing measures constitute only a partial solution. We must better support our colleagues in other educational settings in preparing students for college. Among the measures worth considering are articulation conferences that include secondary-school teachers, enhanced principal-counselor conferences at UW, and distinguished faculty internships that facilitate semester- or year-long visiting appointments for secondary-school teachers. UW's leadership is essential to the creation of more effective partnerships across the P-16 spectrum.

Undergraduate research and inquiry-based learning constitute another form of personalized, connected education where UW can excel. It is here where faculty members have the clearest opportunity to pass on a passion for life-long learning and exploration. Research and creative activity engage undergraduates in the exploratory and integrative sides of learning that are traditionally confined to postgraduate education. Venues for this type of opportunity abound, as demonstrated during Undergraduate Research Days, senior design presentations, art exhibitions, and recitals. Faculty members can be justifiably proud of the Undergraduate Research Day. During the last two years, participants have represented 51 majors from all undergraduate colleges. We encourage the expansion of these and similar opportunities, to allow more students to experience the challenges and rewards of open-ended inquiry.

In a related vein, we encourage other units, including the AHC, the Art Museum, and International Programs, to pursue deeper connections with academic colleges. And we invite all academic units to explore wide-ranging ideas for learning communities that focus not only on specific subjects but also on specific student groups, such as nontraditional students.

The broad concept of civic engagement and its relation to a healthy democracy figures in many national conversations about higher education. The topic arouses disparate points of view, but among the many strategies advocated is service learning, which entails rigorous, academically focused service opportunities embedded in credit coursework. We welcome further investigation into programs of this nature.

The Learning Environment

Academic Success Center

Institution-level strategies for student success should transcend the traditional services that target high-achieving or under-prepared students. Following an idea advanced in the *1999 Academic Plan*, we propose establishing an Academic Success Center (ASC) offering resources for the entire student body.

We envision the ASC embedded in a three-tier system that integrates curriculum development, classroom instruction, and individual student attention. The first tier, comprising the USP and the degree requirements of colleges and departments (see "Structure of the Curriculum"), defines the overarching institutional philosophy. It fosters intellectual growth through an appropriate balance of breadth with specialization. We advance the curriculum via the second tier, classroom instruction. Effective teaching is fundamental to academic success, and strong teaching cultures at the department level serve as the anchors for this tier. Finally, academic success requires a third tier, helping students through one-on-one tutorials, mentoring, advising, and counseling. Far from being the sole province of those at risk, this tier is critical to the education of all students. The purpose of the ASC is to bolster the third tier.

The ASC should provide resources for teaching effectiveness and curricular development. In this vision, the ASC will link programs that assist individual students and support faculty efforts — the Writing Center, the Math Lab, the University Libraries, the Center for Advising and Math Placement, the Center for Advising and Career Services, Student Educational Opportunity, and others — with programs that enhance classroom teaching. For some students, the ASC might provide access to appropriate learning communities that target specific interests. For others the ASC can offer tutorial services with advanced writing, quantitative skills, oral communication, or computer software.

The E-CTL, centrally located near the campus core, is ideally situated to assume leadership in developing the ASC. And, as the list above indicates, many elements of such a center already exist. But coordination among administrative units is weak, facilities are not uniformly adequate, funding and staffing arrangements are often haphazard, and there are gaps. As the E-CTL has illustrated, the guiding principles ought to be effective coordination and communication among different disciplines and resources. The success of the ASC will require sound vision and leadership from the academic faculty. We invite all members of the university community — especially stakeholders in the units most likely to be affected and appropriate support-service units — to help construct a more detailed vision for this idea.

ISSUES

Scholarship and Graduate Education

Expanding knowledge, developing new applications of existing knowledge, and nurturing human creativity are central functions of research universities. These activities, which we subsume under the term scholarship, are core responsibilities of faculty members, whether the work occurs in studios, offices, laboratories, or the field. Strong scholarship is essential to vibrant graduate education.

UW has not undertaken a comprehensive examination of graduate education for at least two decades. The PhD Enrollment Report[11], completed in response to the *1999 Academic Plan*, touched several key issues, but it left room for the identification of institution-wide action items related to doctoral education, and it left other types of graduate programs unexamined. The *2004 Academic Plan* will include graduate education as a major focus. A systematic look at UW's graduate offerings – and the academic culture that supports them – must include not only the PhD and EdD but also such professional programs as the JD and PharmD and the wide array of masters programs, including the MA and MS (Plan A and Plan B), MBA, and MPA.

Universities' reputations hinge in large part on the robustness of their research and graduate enterprises. To enhance UW's stature as a research university, we see three areas that require attention:

- Bolstering graduate education and reshaping the role of the Graduate School
- Building stronger interdisciplinary support for the areas of distinction
- Planning for research infrastructure.

Bolstering graduate education

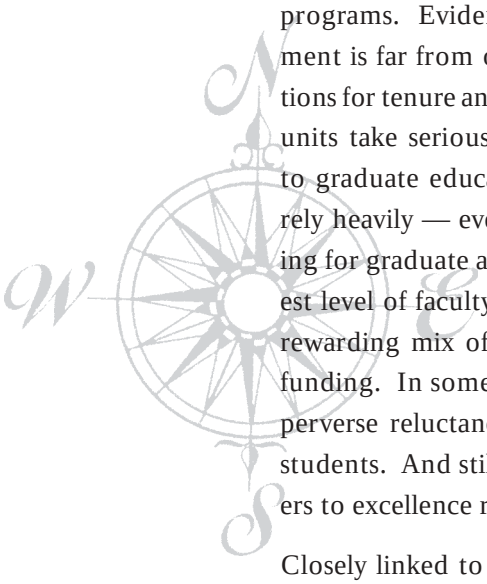
Issues associated with graduate education are sensitive and complex. They include the structure and function of the Graduate School, the small number of graduate programs that enjoy prominence, and UW's culture of assessment in graduate education.

The Life Sciences Report proposes a new model for the structure and function of the Graduate School. Historically, American graduate schools have been bureaucratic in function: keeping records, ratifying departmental admission decisions, and enforcing regulations. UW's Graduate School has done more, developing programs for future college teachers, promoting international recruitment, and advocating for graduate education in central decisions about resource allocation. We propose pushing the model still further. By allowing departments, colleges, and enrollment management offices a greater role in the day-to-day decisions of graduate education, UW can free the Dean of the Graduate School to pursue innovative and cross-disciplinary graduate programs more aggressively and foster stronger links between graduate study and scholarship.

There is no question that graduate education requires strong, central advocacy and vision; the issue is how best to structure and configure appropriate leadership and administrative responsibility.

The issue of national prominence has several dimensions. The small size of most of UW's graduate programs imposes some constraints. But more striking — and arguably more critical — is the apparent lack of emphasis that

Scholarship and Graduate Education



many departments place on their graduate programs. Evidence supporting this assessment is far from obscure. In recommendations for tenure and promotion, few academic units take serious account of contributions to graduate education. Many departments rely heavily — even solely — on state funding for graduate assistantships, when a modest level of faculty effort could yield a more rewarding mix of internal and external GA funding. In some programs there remains a perverse reluctance to recruit international students. And still other self-imposed barriers to excellence remain.

Closely linked to UW's national stature are problems associated with graduate recruitment. Historically, graduate recruitment has largely been the province of departmental-level committees. Only a handful of departments have found these efforts satisfactory, and it is perhaps no coincidence that the most successful departments are those that have strong needs driven by external research funding. But the problem has other roots, most notably the long-standing difficulties associated with international recruitment, recently intensified by federal restrictions. International standing goes hand-in-hand with effective international recruiting.

For nearly a decade, UW's graduate stipends were so low that they hindered recruitment. While the increases in fiscal year 2003 alleviated the stipend gap to a significant extent, we cannot afford to let the problem creep back. Still, for now the salient barriers have shifted. They include the nation's declining undergraduate enrollments in key disciplines, the reluctance of many U.S. students to undertake graduate study in technical fields, and the difficulties that non-native English speakers encounter as graduate assistants. They also include our own hesitancy to explore "fast-track" master's programs and other innovative configurations, as well as the persistent compartmentalization of doctoral programs at a time when many prospective students and funding agencies see interdisciplinary education and research as the wave of the future.

Graduate-level assessment poses equally stubborn problems, evidenced by the fact that few departments mounted meaningful responses to last decade's superficial rankings of the National Research Council. Assessment of graduate programs ought to be the responsibility of the affected disciplines, although it is arguably the proper role of the Graduate School to develop a common culture for assessment. Assessment should be continuous and should hinge on substantive factors such as the strength of applicant pools, programmatic rigor, rates of degree completion, publication of theses and dissertations, professional accomplishments of graduates, consistency of extramural funding, and breadth of involvement by the faculty. And, assessment ought to prompt change.

Graduate education deserves close scrutiny in the *2004 Academic Plan*. Graduate programs, especially doctoral programs, involve significant investments of institutional resources. It is fair to expect commensurate investment of faculty effort. Several doctoral programs — notably in Agriculture and Engineering — have had low rates of doctoral production, measured in degrees granted per

research FTE. Other departments, at the master's and doctoral levels, face issues of insufficient rigor, small applicant pools, and lack of external funding. The PhD Enrollment Report quantifies some of these issues, and other documents offer additional perspectives. We challenge all departments that offer graduate degrees to confront these questions in their academic plans, envisioning changes in academic culture and process that will strengthen graduate education at UW.

Stronger interdisciplinarity

At a university of UW's size, few departments are large enough to cover the breadth of their disciplines *and* attain critical mass in the areas of distinction. For many units, cross-departmental and cross-college ties are the only ways to achieve and sustain scholarly depth. In an era when interdisciplinarity is the key to progress in many fields[12], UW might reasonably regard this condition less as a constraint than as a competitive advantage.

Faculty members in the humanities and social sciences have long recognized opportunities for interdisciplinary research and scholarship. Science, engineering, and business faculties enjoy equally promising opportunities. The Life Sciences Report identifies important interdisciplinary opportunities in the biological, biomedical, and health sciences, including reproductive biology, microbiology, neuroscience, environmental toxicology, basic and applied ecology, stable isotope analysis, and wildlife biology.

The possibilities, however, are hardly limited to the humanities, social sciences, and life sciences. Stronger interdisciplinarity makes sense in many other key areas. We urge all departments to explore interdisciplinary efforts that can invigorate their scholarship, support more vigorous graduate education, and build on the institution's areas of distinction. We welcome realistic proposals for formal and informal structures — including links to other institutions — that can advance these efforts.

Planning for research infrastructure

The infrastructure needed for research and creative activities strains academic budgets at virtually all institutions of higher education. Growth rates in faculty startup costs, information technology and facility needs, and the cost of maintaining an adequate library far outstrip the rates of increase in university budgets, not just in Wyoming but worldwide.

In some disciplines, faculty startup costs are escalating at a startling rate. Indirect cost reversions from external grants no longer suffice to support these costs. Other funding sources are important but limited. They include salary reversions from positions left temporarily vacant and programmatic grants through such initiatives as NSF EPSCoR and the NIH-IdeA programs, BRIN, and COBRE. To meet startup needs without plundering the faculty replacement budget, UW must continue to pursue all external sources that are consistent with our plans, building strength in areas that these sources support. At the same time, departments that expect institutional help with large faculty startups must develop hiring strategies that tap these external sources whenever possible and appropriate.

Scholarship and Graduate Education

Renovation of research and teaching laboratories is also a pressing issue. This problem includes the repair and maintenance of instruments used in interdisciplinary research as well as the remodeling of space. If UW is to continue to build its research enterprise, a regular schedule of laboratory renovation is necessary. To some degree, renovations can be accomplished using federal grant funding. But in the aggregate, renovations depend largely on the availability of state funds, and marshalling these funds will demand planning and difficult priority setting.

Finally, budgetary stresses in the Libraries remain unabated. Particularly troublesome is the ruinous inflation in serial costs over the past decade combined with increased demands by faculty and students for desktop delivery of research materials. Hard choices regarding serial costs are overdue: shall we continue to pay ransom-like subscription rates for steadily decreasing access to our colleagues' work? Or redirect part of our investment into forms of access that mitigate the rapid erosion in purchasing power? Nationally, many faculties have found such initiatives as the Scholarly Publication and Academic Resources Program (SPARC)[13] and Web of Science[14] attractive.

Electronic document delivery holds much promise; however, to fund an advanced delivery system will require the Libraries to revise their budgeting processes. Do formula-based departmental allocations adequately reflect future patterns of use? Are there mechanisms for holding high-inflation serials more accountable? Are there better ways to foster strong partnerships between librarians and research faculty in managing the budget for serials and monographs? The problem is worldwide in scope, and it will not disappear through UW's actions alone. But as intelligent consumers we cannot afford to respond passively.

Diversity, Internationalization, and Access

Three distinct issues share, as a common thread, the richness and inclusiveness of the UW community:

- Diversity
- Internationalization
- Access.

These issues have important implications for UW's recruitment practices, outreach efforts, and resource-allocation decisions. They must also play significant roles in our curriculum.

Diversity

Along with many other universities, UW faces persistent difficulties in cultivating a diverse campus community. Progress in attracting and retaining a diverse student body has been slow; the recruitment and retention of a diverse faculty and staff has been arguably more frustrating; and much of the work of embedding diversity in the institution's curriculum and scholarship remains ahead of us.

It would be unfair and ungrateful to minimize past efforts to overcome the difficul-

ties. Still, the problem calls for bolder measures. These might include the following:

- Stronger connections with diverse communities in the state and region, recognizing the historic importance and growth in many of these communities
- Explicit identification of diversity as a value in faculty position allocations
- Aggressive diversity funding centrally, at the college level, and in Associated Students of the University of Wyoming
- Enhanced efforts to retain a diverse student body, including perhaps the establishment of residence halls with appropriate diversity-related themes
- Scholarships and financial aid strategies that help broaden the nature and composition of the student body, including more scholarships that attract community-college transfers
- Integration of diverse perspectives across the curriculum
- Stronger support for and collaboration with diversity education efforts in schools and community colleges throughout the state
- Statewide and regional efforts to increase the number of minority students who are ready to enter college.

UW must avoid concentrating and therefore isolating responsibility for diversity. These goals, and the task of addressing them through academic planning, belong to all disciplines, all colleges, all levels of administration, and all support units.

Internationalization

Similar difficulties hinder the recruitment of an international faculty and student body, and similar corrective measures may be in order. But there are additional barriers. Only within the past decade or so has the UW community broadly embraced international recruitment. We struggle with our geography, the size and apparent homogeneity of the surrounding community, the lack of opportunities to study English as a second language, and other challenges. To overcome these barriers, we must articulate steadfast support for the recruitment of international students and faculty members.

In its commitment to internationalization, the institution faces special problems in light of recent federal rules governing immigration. While complying with legal constraints, the university must make its interest in international recruitment clear. The Graduate School, in particular, has a role to play in coordinating international recruitment and in facilitating international graduate students' transitions to graduate study, including the fulfillment of GA responsibilities. External and internal constraints notwithstanding, UW's ability to attract undergraduates, graduate students, and faculty members from around the world is critical to our efforts to sustain a world-class scholarly community.

Access

As a land-grant university and as Wyoming's only four-year institution of higher education, UW has an obligation to serve people from all walks of life. Although our cost of

Diversity, Internationalization, and Access

attendance is lower than the costs at most comparable institutions, UW is still out of reach for many. This problem calls for solutions on a number of fronts:

- With support from the institution and colleges, the Outreach School has helped overcome many barriers faced by site-bound and nontraditional students. Recent enrollment trends, together with the effects that a per-credit tuition structure will have in encouraging part-time study through the Outreach School, suggest that the demand for outreach instruction will increase, at least in the near term. This observation is particularly important in our planning for on-line courses.
- Many academic departments have strong traditions of articulation with Wyoming's community colleges. We urge other departments to follow suit, and we intend to continue supporting effective articulation and collaboration at all levels of the institution.
- Our financial-aid strategies need reshaping. If we are truly committed to broad access, it will be important to augment UW's current scholarship packages, now almost exclusively merit-based, to include far more need-based scholarships. This effort should include appropriate benchmarking; clearly articulated, measurable objectives; and more effective communication between academic departments and the administrative units involved in financial aid.
- Our commitment to first-generation college students deserves renewed attention. To broaden access, we must demystify the college experience, through summer residential programs and other forms of outreach that can help students and their parents appreciate the value and accessibility of higher education.
- Accessibility of the curriculum also requires sustained attention to the physical accessibility of UW's learning environments; curricular commitments to disability-related issues, for example through the Wyoming Institute for Disabilities; greater opportunities for financial aid to part-time students; and institutional efforts to accommodate the special constraints faced by nontraditional students.

Curricular implications

The curriculum must reflect UW's commitment to diversity, internationalization, and access. The recently revamped USP reinforces the commitment to diversity and internationalization, as do many of the programs and courses offered throughout the curriculum. However, UW still faces curricular challenges in counterbalancing the distinctive culture of the Mountain West with the rich array of cultures that characterize both the global community of scholars and the broader world that our students will enter.

In particular, we continue to lag behind comparable institutions in the breadth of international programming and in the proportion of students who graduate with international experience. UW has a small number of formal connections to universities in other countries, such as Saratov State University in Russia and institutions in Guatemala, Germany, France, and Spain. And we have nascent ties

to institutions in Australia, China, Brazil, Ireland, and other countries. We also enjoy strong student interest in foreign-language courses. Building on these assets, we must create better opportunities for international experiences, cultivating faculty involvement, administrative support, and formal recognition in the USP of the value of learning in an international setting. In this arena, critical comparisons with successful structures at other universities may be especially illuminating.

One controversial concern is the way in which UW has supported and configured African-American Studies, Chicano Studies, and American Indian Studies. *Moving Forward II* asked "whether a reconfiguration of these (and perhaps other) programs in a more unified structure might promote more prominent scholarship, more avenues for the recruitment of tenure-track faculty, and a stronger, more integrated curriculum." The question bears honest examination. One can argue that the current structures invest disproportionately in administrative and staffing overhead at the expense of academics, leaving a set of program directors with little time for professionally satisfying scholarship. An alternative structure, common at similar institutions, is that of a single department, housing faculty members representing an array of different scholarly interests and supporting the existing minors and perhaps one or more majors. To be successful, this department structure would require more support than the institution currently invests.

Another alternative, among many, is to leave the programs structured much as they are now, with a commitment to bolster them through the hiring of contributing faculty in appropriate departments. This program structure would require the explicit embedding of instructional and research commitments to the three programs in a variety of traditional departments, possibly through the same types of faculty position allocation that have strengthened UW's commitments to Outreach and SENR.

Although this issue may be sensitive, it is important not to lose sight of the reason for raising it: UW must work toward better-supported instruction and richer scholarship in African-American Studies, American Indian Studies, and Chicano Studies. Resources *and* structure matter. The challenge deserves open inquiry, a sense of realism, a willingness to examine what works at other institutions, and a receptiveness to ideas that have yet to be tested. We invite all members of the UW community, and especially the three programs in question and College of Arts and Sciences, to address this question in detail in the next phase of academic planning.

Structure of the Curriculum

The structure of UW's curriculum remains a significant challenge. The overarching principles seem clear enough: curricular structure should ultimately be driven by carefully crafted learning goals, sustained coordination among the faculty, and a commitment to student engagement and academic success. Ideally, the curriculum should capitalize on the institution's emphasis on interdisciplinarity and the intellectual connections among disciplines.

Against this philosophic backdrop stands a more contentious proviso: the curriculum must also be reasonable in scope and extent. Three factors can work against this goal:

- Number of credits required for degrees
- Breadth of offerings
- Complexity of the curriculum.

These factors simultaneously influence student recruitment, the length of time required to complete degrees, the pressures on personnel budgets, and self-imposed strains on faculty workloads. Each of the three factors deserves further comment. In addition, several questions about the structure of USP remain open.

Number of credits required for degrees

Concern about the number of credits required for degree completion reflects a simple premise: focused undergraduates who pursue full-time study should be able to finish the baccalaureate in four years. We recognize that many factors influence students' average rate of degree completion. For this reason, institution-level analyses are now underway to assess both the policies and the student behaviors that slow UW's average rate of degree completion. Still, academic programs have a pivotal role to play. The *1999 Academic Plan* asked academic units to reduce the number of required credits to no more than 128 for the baccalaureate. Most programs meet this challenge; indeed, many of UW's most rigorous departments offer high-caliber bachelor's degrees that require 120 credits.

In many ways, the structure of the USP is fundamental to questions of credit requirements, because USP constrains the degree requirements imposed at the college and department levels. In spring 2002, the Faculty Senate took a significant step by approving a streamlined revision of USP. From one perspective, the USP curriculum is never quite finished. Ongoing, productive discourse over the goals, curricular requirements, and pedagogy that constitute the USP is characteristic of a healthy academic culture. Nevertheless, the implementation of USP 2003 clears the way for review and revision of course requirements at the college and department levels.

It now remains to finish the agenda. In developing their contributions to the *2004 Academic Plan*, programs that require more than 128 credits for the baccalaureate must either include a timeline for streamlining their requirements or explain why such streamlining is impossible.

Breadth of offerings

The second factor, curricular breadth, refers to the sheer number of different courses and programs that UW offers. This issue has direct implications for faculty teaching commitments and levels of academic support, including department budgets and library holdings. The faculty's willingness to manage the breadth of the curriculum is essential to the maintenance of reasonable workloads. Poorly conceived curricular expansion does not garner increased resources; it unnecessarily strains the resources currently available.

ISSUES

Every academic unit has a compelling self-interest in carefully considering the array of courses it delivers. Proper attention to well defined learning goals, coupled with thoughtful curricular review, helps inform this effort. We need not jeopardize quality in the process. Many institutions have attained undisputed excellence with thoughtfully restrained curricula.

Curricular complexity

The third factor, curricular complexity, is more difficult. It involves the ways in which USP meshes with the additional requirements imposed by some colleges, the embedding of USP requirements in the major, the role of elective courses, and the linking of prerequisite courses that occurs at the department level.

Ironically, in a small number of cases the major requirements are so excessive and overprescribed that even the most reasonable USP structure seems like an onerous addition. College- and department-level requirements contribute significantly to curricular complexity. Judiciously implemented, college-level requirements, curricular embedding, and linked prerequisites can all help unify courses of study and promote efficient progress toward degrees. But without careful thought, coordination, and clearly defined learning goals, these factors can tangle and over-constrain the pathways to the baccalaureate, imposing excessive burdens on students. Systematic curricular review and modification, informed by sound assessment of learning goals, must become natural activities for all degree programs.

Structure of USP

As suggested earlier, the USP is never quite finished. Two content-related issues in USP still bear further thought: the intellectual connections between sciences and other disciplines, and technical and scientific literacy.

Many scientific and technological fields are in the midst of a renaissance. Astounding discoveries and advances have become almost commonplace, and successful researchers enjoy generous funding and recognition. In contrast, the arts, humanities, and social sciences often seem to command less attention and recognition than they deserve. This apparent imbalance notwithstanding, embedded within scientific and technological changes lie some of humanity's most difficult challenges and most encouraging prospects. An essential part of contemporary education is learning about the relationships among social traditions, political systems, and human values and the willingness to analyze how science and technology influence them. To meet this need, some universities have developed programs to bridge the sciences and humanities[15]. These programs encourage discourse among diverse disciplines, provoking students to appreciate the complex ways in which science, technology, and society interact. UW's core curriculum still has little to offer in this realm.

Concomitantly, the newly revised USP 2003 leaves many UW graduates woefully shy of the technical and scientific literacy needed in modern society. Short of expanding the core requirements in scientific and technical subjects, it may be possible to address this problem through a small set of carefully designed general science courses, examples of which are currently under development.

Faculty Positions and New Programs

Great universities are built with great faculty. It is little wonder that the most difficult issues that many academic units face are the finite budgets for faculty and academic professional positions and the resulting tensions created by efforts to initiate new programs and enhance existing ones. While the issues are inextricably linked, they fall under two broad headings:

- Budgeting for faculty positions
- Planning for new programs.

Budgeting for faculty positions

The constraints on faculty and academic professional positions are hardly new, but Central Position Management (CPM) has lent the issue greater definition, especially in colleges where starting salaries have grown much faster than UW's budget. The foreseeable influx of new resources is not likely to remove the constraints in the near term. Every academic unit therefore faces two important questions. First, what can we do well within the budget constraints for faculty positions? Second, how can we do it while minimizing the time and money that we siphon away from core faculty responsibilities?

Some of the most significant elements of academic planning will help ease the constraints. Among the measures that can mitigate pressures on the faculty position budget and workloads are regular curricular review and modification, discussed above; increased commitments to interdisciplinary and cross-college endeavors; and long-term adherence to carefully circumscribed areas of distinction. And when new resources do become available, the administration has an obligation to channel them toward academics in proportion to their centrality to the institution.

The 2002 CPM Report provides a useful perspective on academic budgeting. As the concluding discussion notes, it is unlikely that UW will receive enough additional resources to fund new initiatives and independently meet all existing commitments as currently configured. The academic units that fare best in the next few years will be those that find overlapping and synergistic ways to align instructional commitments with efforts to address new academic directions and ongoing institutional priorities.

Colleges and departments must confront this challenge in their plans. Merely adding programs to UW's existing curriculum — or redirecting resources to administration, as a surprising number of faculty members have proposed — will spread resources too thinly, exacerbating budgetary frustrations and thwarting UW's best efforts to budget for an adequate faculty. Further complicating the problem are the often unpredictable nature of faculty resignations and retirements, the pressures imposed by the university's service mission, and the expectations of external constituencies, including funding agencies. We face these issues with or without CPM; the real challenge is how to balance competing claims on UW's faculty resources.

To guide future CPM requests, department and college plans should develop long-range hiring strategies for strengthening selected areas, tempered by budgetary realism and consistent with institutional priorities. The strategies should set forth flexible, achievable plans for hiring over a period of several years,

recognizing that it is impossible to anticipate the timing of all resignations and retirements. Used in conjunction with department- and college-level plans, CPM provides a mechanism by which departments and colleges address not only their immediate needs but also the long-range project of building stable programmatic strength.

We foresee increasingly strong links between CPM and academic planning. For these links to be effective, departments and colleges must articulate their connection to institutional areas of distinction *and* refer explicitly to these areas of distinction and the progress made in advancing them when formulating position requests. The allocations must also recognize units that have made consistent contributions to major institutional goals. With or without modifications to CPM, the department- and college-level plans written during the next phase of academic planning will guide the allocation of resources for several years to come.

Planning for new programs

Related to the issue of faculty resources is the question of how to establish new interdisciplinary programs. The Life Sciences Report outlines a distinctive model for interdisciplinarity in areas that bridge the interests of several established departments. The model involves the establishment of interdisciplinary focus areas having four attributes:

- The intellectual content is important and topical
- The research crosses traditional departmental boundaries
- The activity requires sustainable interdepartmental and cross-college resource commitments
- Opportunities for synergy and ties with other areas are critical to the success of the area.

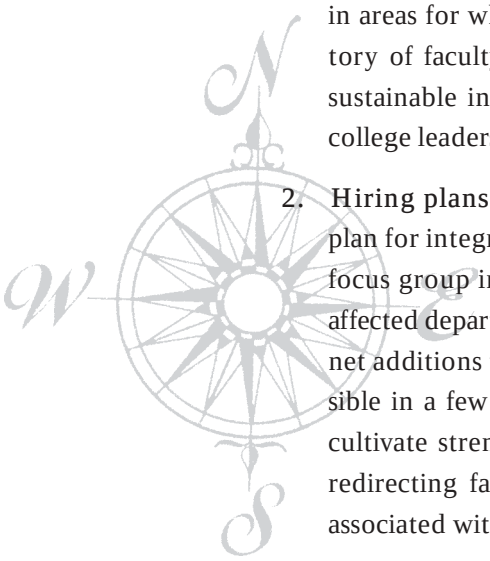
While some of the most compelling current cases for new interdisciplinary focus areas exist in the life sciences, the model can apply equally well to other constellations of disciplines.

We encourage departments and colleges to explore this model wherever it advances the interests of scholarship and education in a manner that is fiscally realistic. Department- and college-level plans are the appropriate vehicles for proposing interdisciplinary focus areas and for describing concrete mechanisms for establishing them.

However, the model will succeed only if the interdisciplinary focus areas established are intellectually vibrant, enjoy support from department heads and deans, and are small enough in number to allow appropriate concentrations of talent and resources. The following is a list of issues that faculty members proposing interdisciplinary focus areas must address if their ideas are to influence the *2004 Academic Plan*.

1. Scholarly foundation. UW must have significant existing strength in the area, and the establishment of a more formal structure must carry strong prospects for increased national and international prominence. It is unlikely that the uni-

Faculty Positions and New Programs



versity will develop recognized strength in areas for which there is neither a history of faculty success nor evidence of sustainable interest by department and college leaders.

2. Hiring plans. There must be a realistic plan for integrating the interdisciplinary focus group into the hiring plans of the affected departments and colleges. While net additions to faculty size may be possible in a few instances, most units can cultivate strength in new areas only by redirecting faculty positions previously associated with other purposes.

3. Degree programs. If the interdisciplinary focus area involves reconfiguration of existing degree programs or proposals for new ones, the proposal must contain a prospectus for how to accomplish these changes. In particular, there must be explicit plans to accommodate any new courses required and an identification of specific activities from which the required instructional resources and graduate assistantships might be redirected.

4. Administrative structures. The proposal must address any administrative issues that arise. Who will manage the interdisciplinary focus area? To what extent will this oversight require diversion of teaching and research energy into administration? How will the interdisciplinary focus area affect tenure and promotion procedures at the department and college levels?

5. Facilities. Can the interdisciplinary focus area succeed within the facilities currently available? If not, are affected department heads and deans willing to reallocate existing facilities to the area? Or will the acquisition of new facilities be essential to the area's success?

Procedurally, faculty members who wish to advance proposals for interdisciplinary focus areas *must* involve the affected department heads and deans and must integrate these proposals into the department- and college-level plans.

ISSUES

Technological Infrastructure

Information technology permits broader access to higher education and alters our learning environments and teaching methods. Powerful IT systems can enhance graduate and professional education, linking UW's activities to other research institutions. At the same time, IT allows many more people throughout Wyoming to profit from the programs that UW offers.

Nevertheless, the need to live within a budget forces us to temper visions of learning anytime, anywhere. UW faces increasingly complex choices among new and emerging technologies, such as Internet-based videoconferencing, video streaming, wireless networking, satellite telecommunications, and desktop delivery of information. We have the continual challenge of upgrading our data network and Internet connectivity for better and faster performance. Demand for data storage and connectivity will escalate as departments and colleges place greater emphasis on the use of technology in their curricula. In addition, we may soon face the necessity — and cost — of converting equipment and facilities, such as those associated with UWTV, to digital electronics.

Embedded in the issue of technological infrastructure are three tasks:

- Evaluating UW's current infrastructure and support
- Planning for and implementing new technologies
- Developing adequate funding.

Evaluating UW's current infrastructure and support

To plan for new technologies, we must assess the current infrastructure and its support. The assessment must cover advanced elements, such as computers, software, networking, videoconferencing; basic components, such as telephones and audio teleconferencing; and the connectivity required to use these components in physical and virtual classrooms. We also need to reconsider the quality and quantity of support available to faculty members who use technology in teaching, research, and service. State-of-the-art hardware and software have little value if the technology's potential is unclear or if users find it too time consuming or difficult.

Although the Division of Information Technology developed a detailed plan for UW's technological infrastructure in 2000, the issues were not prominent in the college- and department-level academic plans that preceded support-service planning in 2000. In the support-service planning that will follow the *2004 Academic Plan*, academic units have the opportunity to be driving forces in defining institutional needs for technological infrastructure, support, and training. We invite the Libraries, the E-CTL, and the Outreach School to assume coordinated leadership in these discussions.

Technological Infrastructure

Planning for and implementing new technologies

Higher education now requires access to a rapidly evolving array of often expensive hardware and software for instructional design, imaging, document preparation, geographic information analysis, numerical and graphic work, statistical analysis, literature searches, and other tasks. The university's willingness to envision an Information, Library, and Learning Center as one of the major funding priorities in its *Capital Facilities Plan*[16] reflects an awareness that these needs will grow in importance. But planning new buildings is at best a start. The more demanding decisions will be those that enable UW to accommodate new and emerging technologies in an affordable fashion. Responsibility for these decisions is distributed broadly, but it resides in part with Information Technology, the E-CTL, the University Libraries, the Office of Research, and the Outreach School.

As a first step in planning UW's technology infrastructure and support, we propose that Academic Affairs and Information Technology organize a university-wide symposium on the issue, to link the *2004 Academic Plan* with the subsequent support-service plan to be developed by IT.

Developing adequate funding for infrastructure and support

The third challenge is to fund acquisition, maintenance, and support. While optimizing the institution's investments in infrastructure is a necessary step, it is not sufficient. UW must tap extramural support for some of its most costly technological needs. Federal, private, and industrial sources are all worth exploring. Consortia involving other institutions offer another promising avenue. In the research arena, national supercomputing centers, funded federally and supporting state-of-the-art facilities provide access to expertise and advanced-architecture machines that few universities can support on their own.

A significant but often overlooked element in infrastructure funding is the use of faculty startup packages. As noted earlier, the escalating costs of these packages strain budgets at every level. New faculty members are just beginning to exploit the synergy that can accrue from the pooling and cooperative use of startup funds. Department heads and deans must take a more active role in exploring economies of scale and cost-sharing approaches that might arise from coordinating startup expenditures in interdisciplinary, cross-college, and inter-institutional settings.

Outreach, Extension, and Community Service

Inherent in UW's land-grant mission is a responsibility to serve the larger community. This service mission involves education and learning in the broadest sense, whether in credit courses and other programs offered by the Outreach School, in the programs offered by the Cooperative Extension Service (CES) in the College of Agriculture, or in various initiatives and services aimed at community, industry and business assistance. Notwithstanding the complexity of these services and the diverse array of providers, the institution's outreach, extension, and economic development services face common challenges:

- Organizing and delivering outreach and extension services
- Identifying appropriate financing and reward structures
- Assessing the effectiveness of current services
- Responding to new and evolving demands.

Organizing and delivering outreach and extension services

A central concept in the *1999 Academic Plan* is that effective outreach credit instruction requires the participation of UW's core faculty. Following this premise, UW has increasingly integrated outreach instruction into the mainstream responsibilities of departments and colleges. The integration has had interesting ramifications: many Laramie-based students now enroll in some of their courses, particularly those offered online, through the Outreach School.

This process is still in its early stages. Additional opportunities to contribute to outreach are broad and numerous. Several departments in the Colleges of Business, Education, Arts and Sciences, and Health Sciences have long-standing programmatic commitments to off-campus instruction. And some have furthered these commitments within the past three years, exploiting incentives available through central position management (CPM) to secure faculty lines in the process. We plan to continue using these incentives. Departments and colleges can strengthen requests for faculty positions by absorbing commitments to outreach instruction and service.

To solidify its gains, the Outreach School must involve more faculty members in planning and policy making. The establishment of a scholarly community focusing on outreach is crucial. UW now has the critical mass needed to cultivate a sustainable core of mainstream faculty, instructional designers, and administrators who understand the emerging structures and technologies required for distance education. Among these structures are multi-institution and multi-state collaborations for online delivery of degree programs. UW's involvement in the Western Interstate Commission for Higher Education (WICHE) and the Northwest Academic Forum (NWAF) can serve as springboards for deeper involvement in such cooperative ventures.

Unlike the Outreach School, the CES has long been integrated into the fabric of fac-

Outreach, Extension, and Community Service

ulty responsibility within the College of Agriculture. Funded in part via federal allocations, the CES is grounded in a tradition of non-credit educational and technical assistance to rural communities and agriculture. The CES faces a variety of challenges associated with changing landscapes in rural communities, natural resources, and production agriculture and ranching. We discuss these issues in more detail below.

In recent years, the university has increased its commitment to economic development and the business community. This effort has spawned an array of business support services, including Mid-America Manufacturing Technology Center (MAMTC), Small Business Development Center (SBDC), and the Wyoming Research Products Center, administered through the Office of Research and supported by expertise in the College of Business, and the Cooperative Extension Service. Greater coordination of these efforts deserves attention in the *2004 Academic Plan*.

Appropriate financing and reward structures

As the integration of off-campus program delivery progresses, it will be essential to craft stable and consistent financing for college commitments to outreach. UW possesses a fortuitous advantage in managing the Outreach School's budget: unlike other tuition revenues, outreach tuition reverts directly to the Outreach School. This budgetary anomaly is left over from a bygone era, when outreach was purely entrepreneurial. But, for the present, it affords an important degree of freedom in financing new distance-learning structures and changing outreach commitments.

In particular, tuition revenues allow the Dean of Outreach to create lasting fiscal incentives for absorbing outreach instruction into core faculty responsibilities. It is possible to channel a stable portion of outreach tuition revenue toward funding for permanent faculty positions. The Outreach School took a first step in this direction in the 2002 CPM process, contributing permanent funding into the faculty position pool in return for permanent instructional commitments. In the future, outreach tuition revenues freed by such commitments might support teaching assistantships, professional development, travel, and equipment and software.

Complementing the financing of on-load commitments to outreach, a recent wage and policy study of outreach programs at comparator institutions may suggest more effective ways to compensate off-load contributions to outreach by faculty members. We encourage the Outreach School to explore new, equitable models for rewarding outreach instruction.

The conversion to a per-credit tuition structure in Fall 2003 will affect the Outreach School's budget. Because outreach students, on average, take fewer credits per year than other students, their overall tuition costs will drop under a cost-neutral conversion. For this reason, net tuition revenues to the Outreach School may decrease in the short term. In the long term, however, it is possible that more equitable tuition, coupled with enrollment growth, will lead to offsetting revenue increases. An important challenge for the Outreach School and the academic colleges that provide the instruction is to develop strategies that take advantage of the fairer

pricing resulting from the tuition structure change.

One result of the *1999 Academic Plan* was the formal endorsement of entrepreneurial outreach programs. In concept, this endorsement was intended to identify programs with sufficient demand to allow for differential pricing and hence the potential for financial self-sufficiency. To date, there have been no programs designated as entrepreneurial under this model. We propose that the Outreach School consider cautious experimentation with entrepreneurial funding strategies to fund programs where demand may be fluctuating, ephemeral, or only weakly linked to long-range state needs.

The CES faces fundamentally different financial challenges. Its significant service mission rests on the adequacy of permanent state and federal funds, the latter having been essentially static over the past decade. As pressures for extension services have increased, the purchasing power of the personnel dollars dedicated to extension has diminished. As a result, the College of Agriculture has been squeezed to do more with less. The problem has implications for academic budgets institution-wide, especially to the extent that extension responsibilities are embedded in faculty job descriptions. Allocating extension-based salary dollars and faculty job descriptions in more focused and accountable configurations may help sustain reasonable levels of commitment to CES, while allowing the College of Agriculture to continue meeting its responsibilities in credit-bearing instruction and research.

Assessing effectiveness

Moving Forward affirms a clear institutional commitment to the effective assessment of learning outcomes. This commitment applies to both on-campus and off-campus programs. The Outreach School has begun to address this commitment through coordination with the E-CTL and the affected academic units, and this project warrants continued effort. Non-credit programs, such as those offered via the CES, are subject to less rigorous assessment mandates. Nevertheless, they also have a responsibility for continuous assessment and improvement. As a starting point for a more systematic approach, we encourage the College of Agriculture to implement the CES Strategic Plan[17] developed in 2002, as modified by the President's statewide Blue Ribbon Task Force on the Cooperative Extension Service.

A new vision for outreach has brought with it new needs for support services. With the embedding of off-campus instruction into core faculty responsibilities comes a parallel responsibility to integrate the administrative aspects of outreach into the campus mainstream. Nowhere is this challenge more visible or more commonly articulated that in student registration. UW has made great progress in facilitating seamless student enrollment for off-campus and on-campus programs, but much work remains. Similar challenges exist in other outreach-related procedures, including the delivery of advising and other services for outreach students, the effective coordination between academic units

Outreach, Extension, and Community Service

and the Office of Conferences and Institutes, and the administration of consistent tuition policies for credits delivered off-load.

Responding to new and evolving demands

The demand for outreach instruction hinges on the aspirations of Wyoming's citizens, their life circumstances, their interest in lifelong learning, and UW's commitment to broad access. Outreach demand is also intertwined with the changing economy of the state and region. The Outreach School, together with faculty members who teach off campus, play a critical role in the development of a workforce that can meet the emerging and unmet needs of Wyoming's businesses and communities. Other units, such as those involved in providing veterinary, clinical, or medical services, have a responsibility to provide high-quality services in ways that integrate the needs of the community with the mission of the university.

The 1999 statewide needs survey, conducted on the heels of the *1999 Academic Plan*, launched an era of better-informed planning and increased responsiveness to the interests of Wyoming's citizens. However, because needs and interests evolve, the assessment of statewide and regional needs for outreach education must be ongoing. We encourage all outreach units to consider mechanisms for the systematic, periodic assessment of statewide needs. The Outreach School has begun these efforts, but its focus is primarily on credit-bearing degree and certificate programs. Similarly, the College of Agriculture has begun to assess statewide needs via its recent visioning process. The *2004 Academic Plan* furnishes a timely opportunity for both units to convert research and discussion into commitments for action.

More broadly, we see untapped opportunities for cooperation between the Outreach School and other statewide educational resources. The Outreach School already maintains substantive ties with Wyoming's community colleges, and these ties are worth cultivating in concert with UW's academic departments. A more intriguing opportunity involves the CES. Both the Outreach School and the CES have offices and educators throughout Wyoming, and they play important roles in lifelong learning and community development. Better articulation between the two units offers a strategic avenue for more efficient and effective educational services statewide. We challenge the College of Agriculture and the Outreach School to explore this opportunity in depth.

ISSUES

Enrollment Management

UW has made laudable progress in enrollment management since the *1999 Academic Plan*. The creation of an enrollment management team, increasingly sophisticated recruitment, and better coordination between Student Affairs and Academic Affairs have all helped reverse the trend of declining enrollments. Nevertheless, the mission and fiscal health of the institution mandate further progress. Among the issues that call for detailed planning are:

- Refined recruitment and enrollment targets
- Budgetary implications of enrollment increases
- Appropriate strategies for student retention.

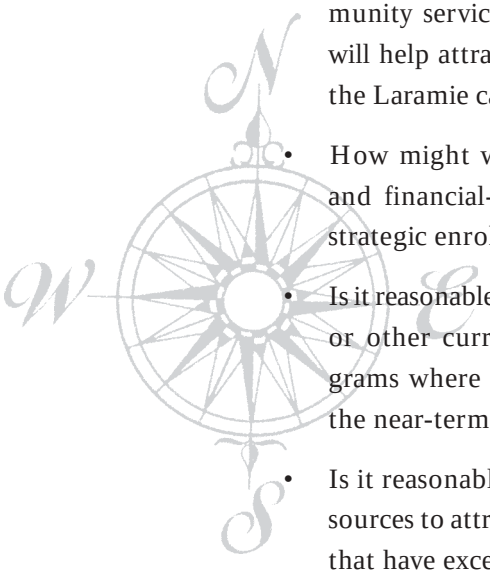
Refined recruitment and enrollment targets

So far, UW's enrollment goal has been simple: increase the total number of students. The effort has paid off. In the face of anticipated declines in the number of Wyoming high-school graduates, the number of UW students grew from 11,743 in fall 2000 to 12,402 in fall 2001 and to more than 12,700 in fall 2002. Even after substantial tuition discounting, this growth yielded an estimated $900,000 in additional tuition revenues. Yet while appealing in its simplicity, the goal of increasing student enrollment ignores questions about the distribution of students among degree programs, the balance between on- and off-campus enrollments and resources, the composition of the student body, and the effective use of different recruitment strategies.

A more refined recruitment strategy should sustain healthy enrollments *and* address these other considerations. But currently there is little consensus about the objectives. Among those questions that will need to be addressed at the institutional level are the following:

- What is the proper balance between graduate and undergraduate enrollments; full-time and part-time students and resident, non-resident, and tuition-discounted students?
- What is the appropriate mix of on-and of-campus enrollments? In what terms (credits, headcounts, student FTEs) should we gauge this mix?
- How can UW recruit students into understaffed professions critical to the state and region? Examples include health-care professionals, business leaders, and secondary teachers in mathematics, science, and special education.
- What recruitment strategies will help promote diversity and internationalization?
- What strategies will help attract the most academically promising students?
- What collaborative recruiting strategies with other institutions will help sustain healthy student enrollments?
- How can we take better advantage of the proximity of students in neighboring states who live closer to UW than to their own states' major universities?

Enrollment Management



- What campus-sponsored activities, community services, and cultural amenities will help attract prospective students to the Laramie campus?
- How might we tune UW's scholarship and financial-aid processes to support strategic enrollment goals?
- Is it reasonable to impose enrollment caps or other curricular constraints in programs where student demand outstrips the near-term instructional capacity?
- Is it reasonable to target scholarship resources to attract students into programs that have excess instructional capacity?

At the department and college levels, we invite faculty to consider the following questions:

- How can colleges and departments administer their scholarship programs to align and coordinate with university recruitment goals?
- What recruitment programs and strategies are available to enhance minority, international, and graduate enrollments?
- What collaborative programs might be explored with other institutions?
- Are there recruitment or retention strategies unique to the department or discipline that might warrant exploration?

Budgetary implications

The budgetary implications of enrollment increases are far from clear. Two sources of ambiguity stand out: the poorly understood relationships between enrollments and revenues and the ill-defined links between enrollments and academic budgets. The first issue is technical. UW's existing revenue models do not adequately account for the effects of tuition pricing on student demand. Institutional decisions about tuition increases and tuition discounting arguably require more sophisticated tools that incorporate the elasticity of demand for education.

The question about linking enrollments and budgets is administrative in nature. Although the proximate objective is to increase student enrollments, one of the real goals of enrollment management is to increase revenues. Currently, there is no agreed-upon mechanism for returning enrollment-driven revenue increases to academic units that bear the associated workload increases. Central position management allows administrators to shift some existing resources adaptively, but the resources at stake have at best weak connections with current enrollment changes. In fact, CPM resources largely reflect the status quo ante, because they result from resignations and retirements. In addition, these resources are random to some extent, because faculty departures are neither precisely manageable nor predictable in the near term. The incentives to recruit and retain students must come from other sources. If deans and faculty members see direct, discernible links between academic budgets and enrollment revenues, support for enrollment growth will follow.

ISSUES

Student retention strategies

Success in recruitment will be meaningful only if we retain students. Information from the Office of Institutional Analysis indicates that only about half of the students who enter UW complete their undergraduate degrees. Although our third-semester retention rate (79 percent) is now healthy in comparison to similar institutions, barriers to degree completion persist. Intervention programs abound. The list includes the University Studies Program, Freshman Interest Groups, Project Synergy, orientation, student support services, and other efforts. But, owing to life circumstances, educational goals, and financial capacity, many students choose not to finish degrees or are unable to do so.

Although UW enjoys some distinct assets — such as its personal scale — better retention calls for more deliberate measures. Assessing teaching practices and modes of delivery in lower-level courses is one example of such a measure. We recognize that UW's accessibility attracts some ill-prepared students whose academic success is at risk a priori. However, our attrition rates still exceed levels that are easily explained by poor preparation alone. We have a responsibility to do better.

The point is to retain students who can succeed. But doing so poses challenges at several levels. Individual faculty members face the challenge of maintaining high standards while accommodating different levels of readiness. Departments must capitalize on UW's distinctive opportunities for student-faculty connections, including inquiry-based learning and undergraduate research, to keep capable students engaged. And there is a more delicate institution-level challenge, namely, offering fair opportunities for underprepared students without injudiciously siphoning resources away from those better equipped to succeed. One strategy for confronting these challenges is through the Academic Success Center (see "The Learning Environment"). Another strategy may lie in strengthened collaboration with P-16 schools, to ensure a more seamless transition into post-secondary education.

Regardless of the approach to improve student retention and graduation rates at UW, we must recognize that attrition represents far more than lost revenue; it represents unrealized returns on society's investments in the future.

EXPECTATIONS

Timelines, Expectations, and Protocols for Department and College Plans

This section defines the timing and format of documents to be produced as part of the *2004 Academic Plan*. Consistent with the planning principles outlined earlier in this document we envision the development of the college and departmental plans as neither top-down nor bottom-up. Rather, college deans must work with department heads and program directors to ensure sustained communication, articulation, and iterative refinement as the plans develop.

General guidelines

Plans should be concise. Circuitous treatises and voluminous compilations of data are less likely to garner support than are succinct documents that people can digest and articulate. A single page of text for each of the elements listed below may suffice:

- Progress on action items from the *1999 Academic Plan*
- Curriculum
- Assessment
- Areas of distinction
- Issues in *MFIII* that are germane to the department, including college-level issues
- Other issues that are germane to the department
- Action items for 2004-2009.

However, specific formats, page limits, and document organization remain the prerogatives of deans and academic units. We encourage all academic units to develop executive summaries suitable for aggregation into a short planning synopsis that will be accessible to external audiences.

Any action items requiring significant infusions of resources (funding, personnel, professional development) not currently available should include realistic suggestions, with justification, of potential funding sources. Any department-level initiatives or resource requests that advance to Academic Affairs will be assumed to have the support and endorsement of the college dean. If there are action items that have implications for other academic units, please summarize the collaboration undertaken with those units and the progress made to date.

For matters that require reference to lengthy planning or policy documents, it is appropriate to include short summaries of the documents and to refer to web sites where readers may find the documents.

Department- and program-level plans

At the department and program level, draft academic plans should take the form of addenda to the year-end reports currently required by college deans. These drafts should be available for review by the department faculty, faculty in other departments as appropriate, and the college dean during summer 2003 and the first part of fall 2003. College deans should provide feedback on department- and program-level plans to help ensure their realism and consistency with college- and university-level priorities. Final department-level plans, incorporating revisions, are due in the college deans' offices and in the Office of Academic Affairs no later than October 1, 2003. They should be available in electronic format, suitable for posting on the Academic Affairs website.

Moving Forward III should guide the identification of areas of distinction and the discussion of key issues. In particular, academic units must address issues connected with credit requirements for the baccalaureate, assessment of student learning, and contributions, if any, to interdisciplinary focus groups as discussed under "Budgeting for Faculty Positions and New Programs." Department-level plans should identify compact, focused connections to institution-wide areas of distinction, where possible; outline the key issues facing the unit; and list a set of clear, significant, achievable action items to be undertaken during the next five years.

College-level plans

Draft college-level plans are due in the Office of Academic Affairs no later than September 1, 2003. Colleges should make these draft plans available for review by college faculty and other constituencies, as appropriate. After discussion between college deans and administrators in Academic Affairs, colleges may revise their plans and resubmit them, in electronic format suitable for posting on the Academic Affairs website, no later than December 1, 2003.

College plans should follow a structure analogous to that of department- and program-level plans: areas of distinction, significant issues, and action items. Again, *Moving Forward III* should guide the identification of areas of distinction and the discussion of key issues, and the action items should be clear, significant, and achievable within the five-year planning horizon. College plans should also address issues bearing on college-level commitments of resources to new programs or initiatives.

University-level plan

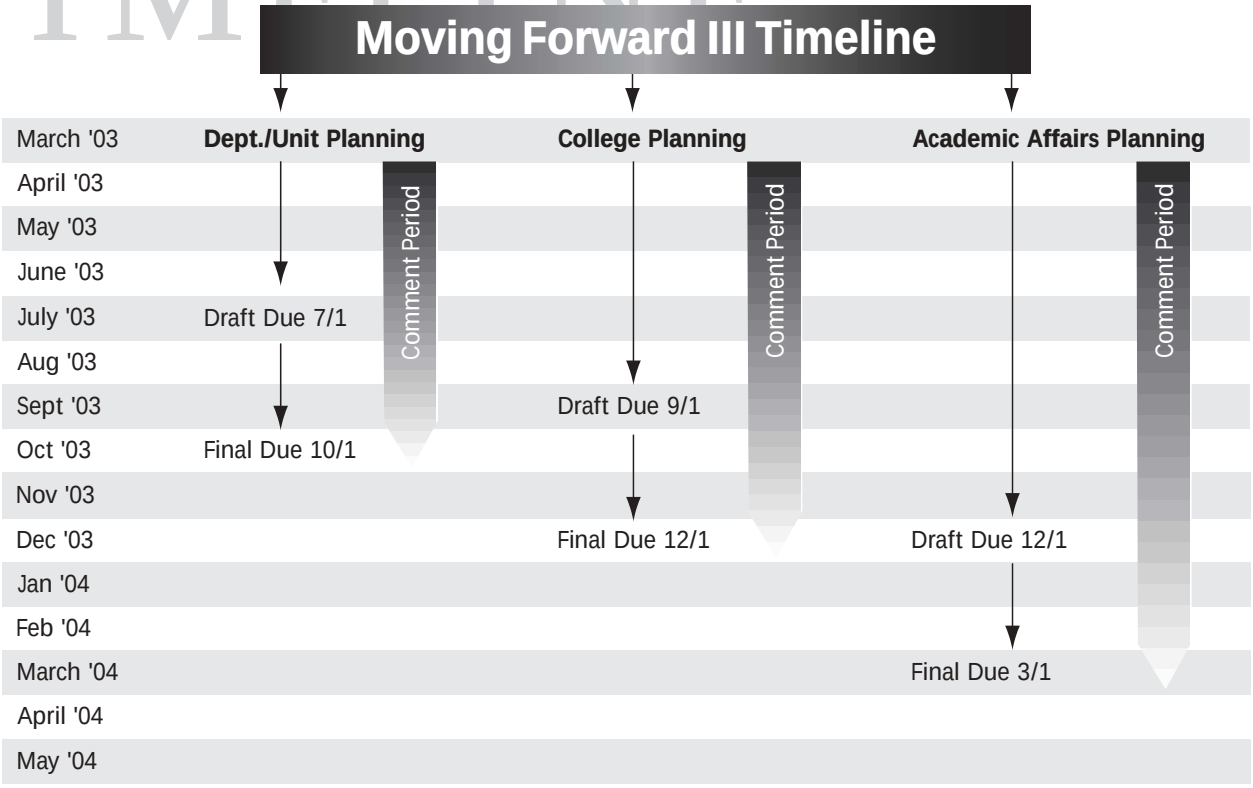
Administrators in the Office of Academic Affairs and the Office of Research will begin drafting the institution-wide plan in March 2003. The issues addressed in the plan will parallel those identified in *Moving Forward III*, but the plan will also include a related set of action items to be undertaken during the period 2004-2009. A draft of the institution-wide plan, informed by plans drafted at other levels, will be available for review by the university community and its constituents no later than December 1, 2003.

A revised, final version of the plan will be distributed by March 1, 2004. The plan will be subject to review by the Board of Trustees, who may vote on the plan in the summer of 2004.

Comment periods

Plans at all levels are subject to comment by anyone interested in the institution's future. The comment period began with the release of the first *Moving Forward* document, in spring 2002, and is ongoing until the release of the final version of each plan. Comments directed to administrators in Academic Affairs are welcome, in any reasonable format, until March 1, 2004.

TIMELINE



GLOSSARY

Glossary of Acronyms

AHC –American Heritage Center

ASC – Academic Success Center

BRIN – Biomedical Research Infrastructure Network

CES – Cooperative Extension Service

COBRE – Centers of Biomedical Research Excellence

CPM – Central Position Management

E-CTL – Ellbogen Center for Teaching and Learning

ENR – Environment and Natural Resources

EPSCoR – Experimental Program to Stimulate Competitive Research

FTE – Full-Time Equivalent

GA – Graduate Assistant

GIS – Geographic Information Sciences

IENR – Institute for Environment and Natural Resources

IT – Information Technology

K-12 – Kindergarten-through-high-school

MFI, MFII, MFIII – Moving Forward I, II, and *III*

NWAF – Northwest Academic Forum

NIH – National Institutes of Health

NSF – National Science Foundation

P-16 – Preschool-through-baccalaureate

SENR – School of Environment and Natural Resources

USP – University Studies Program

WICHE – Western Interstate Commission for Higher Education

WEBSITES

Website References

[1] Moving Forward Comments (MFI, 2002), (MFII, 2003)
http: / / www.uwyo.edu / acadaffairs / Acad_Plan_ImplementationAcad_Plan_Implementation.htm

[2] Moving Forward III, 2003
http: / / www.uwyo.edu / acadaffairs / Acad_Plan_Implementation / Acad_Plan_Implementation.htm

[3] University of Wyoming Academic Plan, 1999-2004
http: / / uw-docs.uwyo.edu / theplan /

[4] Central Position Management at the University of Wyoming
http: / / www.uwyo.edu / acadaffairs / policystatements.htm

[5] Life Sciences Report, 2002
http: / / www.uwyo.edu / acadaffairs / PolicyStatements / Life_Sciences_Report.pdf

[6] Assessment of Student Learning
http: / / www.uwyo.edu / acadaffairs / ASSESSMENT / index.htm

[7] University Studies Program
http: / / www.uwyo.edu / unst /

[8] UW Self-Study Report for North Central Association Reaccreditation, 2000
http: / / www.uwyo.edu / NCA / Selfstudy / Html.htm

[9] Unit Review Guidelines
http: / / www.uwyo.edu / acadaffairs / PolicyStatements / program_review.doc

[10] Learning Communities
http: / / www.uwyo.edu / acadaffairs / Learn_Comm / default.htm

[11] Ph.D. Enrollment Report, 2001
http: / / www.uwyo.edu / acadaffairs / PolicyStatements / Graduate_Education / doctoral_enrollment_report.htm

[12] National Science Foundation, Crosscutting Programs
http: / / www.nsf.gov / home / crssprgm /

[13] Scholarly Publishing and Academic Resources Coalition
http: / / www.arl.org / sparc

[14] Web of Science
http: / / wos.mimas.ac.uk

[15] Pennsylvania State University Science, Technology, and Society Program
http: / / www.engr.psu.edu / sts /

[16] University of Wyoming Capital Facilities Plan, 2002-2007 (Draft)
http: / / www.uwyo.edu / President / capital_facilities_plan1.htm

[17] Cooperative Extension Service Strategic Plan, 2002
http: / / agecon.uwyo.edu / cesstrategicplan / default.htm

moving forward III