

## Kansas State University's Program Review – 2016 Institutional Overview

The mission of Kansas State University (K-State) is to foster excellence in teaching, research and service that develop a highly skilled and educated citizenry necessary to advancing the well-being of Kansas, the nation and the international community. The university embraces diversity, encourages engagement and is committed to the discovery of knowledge, the education of undergraduate and graduate students, and improvement in the quality of life and standard of living of those we serve.

Review of selected degree programs each year helps assure that the university continues to offer rigorous and relevant curricula to meet the needs of students, faculty, the state of Kansas, and the Kansas Board of Regents (KBOR). Such reviews also ensure that the institution is heeding to its mission and strategic goals. For the 2016 cycle, K-State reviewed a total of 23 degree programs in 12 disciplinary areas. The following disciplines were included:

- **College of Agriculture** – Plant Pathology.
- **College of Architecture** – Architecture, Community Development, Environmental Design and Planning, Interior Architecture, Landscape Architecture, and Regional and Community Planning.
- **College of Arts and Sciences** – Chemistry, Geology, Mathematics, Physics, and Statistics.

The following provides a description of the review process. The next section provides significant highlights of each program. The final section proposes recommendations for the departments and their related degree programs that did not meet the minimum criteria.

### DESCRIPTION OF THE REVIEW PROCESS

The process began with each department examining its assessment of student learning. The Assessment office for undergraduate programs and the Graduate School Assessment and Review committee for graduate programs reviewed the summarized report of student learning outcomes and provided recommendations for improvement. The department examined the statistical data and drafted a summary report including information on the (1) mission, centrality, uniqueness; (2) quality of faculty; (3) quality of degree programs; (4) external demand; (5) service provided to the discipline, the university and beyond; and (6) cost effectiveness. The department also added a short summary of the assessment report and provided any major achievements and challenges since its last review. Each department, in consultation with the dean of the Graduate School and/or the respective College Committee on Planning (CCOP), finalized the summary Assessment and a summary Institutional Recommendations Report for its academic programs (by CIP code) as required by KBOR. The report covered all degree levels (bachelor, master's and/or doctoral) for each CIP code degree offered by the department. The summaries were then reviewed by the college dean, CCOP, and the dean of Graduate School (if applicable). The college dean then forwarded the summaries to the Provost Office for review and comment. The Provost Office returned any comments on the summary reports to the college dean. Suggested revisions to the summaries were made by the dean and the revised documents were sent back to the Provost Office for final approval. The summaries for all programs are attached. Where possible, the summary reports for all degree programs within a given department were combined into the same narrative which is slightly longer than the required two pages.

### SUMMARY OF THE PROGRAMS REVIEWED

Of the 23 degree programs reviewed, six are doctorates, 12 are masters, and five are bachelor's degree programs. On the whole, all of the degree programs are in strong and viable academic disciplines. Overall, each department and its academic programs provide options and opportunities for the advancement of education, research, and service for the state of Kansas, the nation, and the world.

#### *College of Agriculture:*

In 2013 the U.S. National Research Council ranked the **Department of Plant Pathology** as number one in Plant Pathology in the nation. The department has continued to be a leader in the College of Agriculture in research, and its M.S. and Ph.D. programs both benefit from research success. The courses in the graduate curricula draw students from other KSU programs, especially graduate courses in genetics, genomics, biotechnology, bioinformatics and the molecular biology of plants and microbes. In the last five years, nearly two-

thirds on average and over half annually of the Department's student credit hours are taken by students outside of their graduate majors. The research performed and published by graduate students in the Department is critical for bringing in extramural funding to the university. The Department provides a trained workforce for the state of Kansas as well as for other states and countries, especially in managing plant diseases.

### ***College of Architecture, Planning and Design:***

The College of Architecture, Planning and Design's mission is to be a comprehensive design community comprising all scales of the design and planning endeavor, informed by a culture of inquiry, focused on the significant issues facing our society including environmental stewardship, social equity, economic viability and aesthetic delight in support of the University's mission as a Land Grant institution. The College strives to be a nationally recognized center of design and planning excellence and a nexus of interdisciplinary engagement, outreach and research serving the University, the profession and society.

The **Department of Architecture** and its professional masters (M. Arch) and Master of Science in Architecture (M.S. Arch) degree programs have been very accomplished over the review period, particularly in regard to student quality, retention, and graduation rates; continued excellence in research/scholarship and outreach, and judicious faculty and resource use. The construction of a new facility for the College is a significant achievement, directly addressing National Architectural Accrediting Board's (NAAB) perennial concerns over the amount and quality of space for the professional program. The new facility will allow for the strengthening of the Department's degree programs, an increasing student base, the development of its faculty, and its commitment to design-centered outreach and service. The M. Arch degree remains strong, highly regarded, and highly effective in training emerging architects and other professionals has been strengthened by the addition of a new entry point – the Post-Baccalaureate M. Arch track - and the successful recruitment of new student constituencies. These measures have proven successful in helping the Department to retain student enrollment levels. The M.S. Arch program shares in the successes of the College and Department as a whole, with its sole challenge of increasing student enrollment. The past four years have been transitional for the M.S. Arch, as strategic restructuring has been undertaken and a temporary reduction in available space during the reconstruction of Seaton Hall has occurred. The Department has deliberately held down the number of admissions during this period. This does not reflect the actual interest in the program because the number of acceptable applicants to the M.S. Arch is many times larger than the number admitted.

As a relatively new degree offering, the Ph.D. in **Environmental Design & Planning** takes advantage of the diverse but interrelated nature of the college's design and planning disciplines. This interdisciplinary program represents the comprehensive nature of the professional community and reflects the manner by which faculty and the profession actually interact in practice. A central aim of this doctoral program is to support advanced graduate research utilizing a comprehensive interdisciplinary view of design and planning to better contribute to a more livable and ecologically sustainable society. In addition, this doctoral program's main objective is to prepare professionals and researchers who wish to teach at the graduate level or conduct research, design, and/or policy for private or public institutions, including governmental agencies, design and planning firms, and corporations.

The Master of Interior Architecture & Product Design (MIAPD) is housed in the **Department of Interior Architecture & Product Design**. There is no other degree in Kansas nor in the nation, that combines the integral aspects of interior architecture, furniture design, and product design, combined with the undergraduate and graduate level research and design synthesis as the MIAPD. The department has developed and initiated a Post-Baccalaureate track to enter the MIAPD; the first students entered during the summer of 2016. Achieving continual national ranking, high employment rates at top firms, and the national recognitions through scholarly and creative work of faculty and students are each major accomplishments.

The **Department of Landscape Architecture and Regional & Community Planning** program offers two accredited professional degree programs, a Master of Landscape Architecture (MLA) and a Master of Regional & Community Planning (MRCP), each providing highly-qualified and -regarded professionals to the State of Kansas for more than 50 years. A Minor in Community Planning complements the MRCP degree. In addition, the MRCP program offers an online Master of Science in Community Development (MS CD) as a part of the Great Plains Interactive Distance Education Alliance (GPIDEA) collaborative program. The programs' synergistic relationship allows for effective shared responsibilities in departmental governance and external representation as well as cross-disciplinary course offerings. At the same time, each program meets discipline-specific accreditation standards and is staffed by discipline-specific faculty. Major achievements of the ***Master of Landscape Architecture degree program*** include award of the \$50K first place prize in the 2013 Urban Land

Institute competition to a team led by landscape architecture students; consistent ranking in the top eight landscape architecture graduate programs in the United States and the only program in this group with a non-baccalaureate track; and, most importantly, graduates employed as professional landscape architects in the top firms in the world. Major achievements of the ***Master of Regional & Community Planning degree program*** include addition of the non-baccalaureate MRCP track that has rejuvenated student enrollment; first-time recognition of the MRCP degree in the *Planetizen* rankings, placing it above all public universities in the immediate region; and, most importantly, graduates employed as professional planners in public and private practice across the United States. Major achievements of the ***Master of Science in Community Development*** (M.S. CD) include achieving student enrollment growth; fiscal growth allowing employment of a program director; developing a more focused and rigorous capstone degree completion experience; and engaging new faculty in teaching M.S. CD courses taught by K-State. This relatively young degree program is on a positive trajectory that promises to continue.

### ***College of Arts and Sciences:***

Chemistry is often called the “Central Science” by virtue of its intersections with the disciplines of Mathematics and Physics at its theoretical boundaries, and by its overlaps with Biology, Biochemistry, Engineering, Environmental and Agriculture Science, and Medicine at its practical and applied boundaries. The **Department of Chemistry** offers a bachelor’s, master’s and Ph.D. degree programs and is crucial to many areas identified as State and National priorities including Energy Conversion, BioScience, Homeland Security, Disease Prevention and Treatment, Materials and Environmental Stewardship. The bachelor’s degree students continue to receive prestigious national recognitions and their success at gaining either employment or admission to highly competitive graduate and professional programs is a clear indication of the quality education being provided in the department as well as the program’s re-accreditation by the professional society. In addition, Chemistry graduate students have received many campus and national awards including six who have received highly competitive NSF Graduate Fellowships and at least two students have received highly competitive NIH postdoctoral fellowships to continue their academic careers. In the past eight years, Chemistry students and faculty members have been awarded 18 U.S. and International Patents based on research conducted within the graduate program.

In recent decades, Geology has progressed from a predominantly observational applied science, based on traditional fieldwork and mapping, to an analytical and predictive science that applies cutting-edge technology to further understanding of earth processes. Over the past eight years the **Department of Geology** has made considerable strides in acquiring research-grade instrumentation. Some highlights include establishing state-of-the-art facilities in X-ray diffraction, luminescence research and dating, chromatography and spectrophotometry (for water and gas analysis), as well as expanded capabilities in microscopy (including epifluorescence, reflected light and Raman spectroscopy). The recent achievements in the department’s energy research concentration have initiated in-kind contributions of industry software to the department including Petrel from Schlumberger valued at over \$10 million. The department has also developed a partnership with Paragon Geophysical (Wichita), which has led to donation of a state-of-the-art 1,000 channel 3D seismic system valued at \$800,000. Collectively, these capabilities make K-State Geology B.S. and M.S. programs unique in the state and region in its ability to acquire, process, model and integrate, and interpret 3D seismic at industry depths and resolutions which are skills highly sought after by the industry.

Mathematics has been the central element of western education since Plato posted “No Entry Without Geometry” over the entrance to his Academy. The **Department of Mathematics** undergraduate degree is purposefully flexible so students can pursue a wide range of options such as Applied Mathematics, Actuarial Mathematics, Pre-Graduate Studies, and Mathematics Education. During the last eight years, three math majors have won Goldwater scholarships, and a fourth was an honorable mention. Beyond work in pure mathematics, researchers and graduate students in the Department work on joint projects receiving extramural funding with faculty in Physics, Psychology, Engineering, Education, and Veterinary Medicine. Major improvements to the graduate program include development of new interdisciplinary links to Engineering and the Institute for Computational Comparative Medicine in the Veterinary School. The graduate program continues to be an integral part of the Center for Integration of Undergraduate, Graduate, and Postdoctoral research, which involves graduate students in supporting research experiences for undergraduates.

The **Department of Physics** is an integral part of the College of Arts and Sciences and forms the core for all natural sciences and technology. The Department provides undergraduate physics majors with the skills they

need to contribute effectively in their chosen careers. In the graduate education program (M.S. and Ph.D.) the Department produces a person confident of his/her ability to function as a professional physicist. The Department also provides education for students in scientific, engineering, and other disciplines that require an understanding of both basic physics concepts and applications of physics. Over several decades the Department has developed five tracks of introductory physics to accommodate the special needs of engineers, pre-med, chemistry, biology, architecture, education, and non-science majors. The numerous national awards won by the faculty and students including *two* Carnegie/CASE US Professors of the Year awards and ability to procure an average of \$9 million/year of competitive federal funding over the last five years for research speaks highly of the quality of the department faculty.

The **Department of Statistics** was founded in 1959 and, like many other statistics departments at land grant institutions, it was formed due to a need for collaborative research in the agricultural sciences that included quantitative scientists. The reputation of the Department and the Statistical Laboratory has historically been built on the relationships and collaborations established with agricultural scientists. The department at K-State has adapted to the new opportunities presented by the transformations of readily accessible computing technologies and emergence of biotechnologies in which the faculty are engaged in moving the science of statistics forward while also aiding the other sciences in their progress towards better understandings of our world. While other Kansas universities offer degrees in mathematics that have an emphasis on statistics, and KU Med has a graduate level program in biostatistics, K-State has the only department of statistics in the state of Kansas offering undergraduate and graduate degrees in statistics.

## RECOMMENDATIONS

Of the 23 programs reviewed, 15 have been recommended for continuance. This review identified two bachelor's programs, five master's programs and one doctoral program with low enrollments and/or few degrees conferred. Also, one program was identified with low number of tenure/tenure track instructional faculty. Rationales for continuing and/or reviewing the eight programs are summarized below.

The five year average for the number of majors (juniors and seniors) and number of degrees conferred in the B.S./B.A. degree in **Statistics** (13 and 4 respectively) fell below the KBOR minimum of 25 students enrolled and 10 degrees conferred. It is important to note that the undergraduate degree curriculum in statistics is largely composed of courses that are needed by other majors and would be offered regardless of a B.S./B.A. degree in statistics. With that said, this program should be retained and marked as Service Support Program (SSP).

The five-year average number of degrees conferred (average of six) for the B.S./B.A degree in **Physics** is slightly below the KBOR minimum of 10 degrees conferred. During the last five years the numbers of undergraduate majors has increased from 37 to 104 while maintaining the high quality of incoming students which consistently score above the 90<sup>th</sup> percentile on the ACT. With the average number of majors exceeding the KBOR minimum of 25 and the FY 2016 degrees conferred was 19 creating a five year average equal to 10, meeting KBOR minimum, it is recommended that this program be continued.

The five-year average for the number of majors and number of degrees conferred in the **M.S. Arch** program fell below the KBOR criteria of 20 students enrolled and five degrees conferred (eight and three respectively). The M.S. Arch program is an important component in the Department of Architecture's and College of Architecture, Planning and Design's efforts to align with the University's 2025 plan, and is integral to strategic planning. As a result, the Department is committed to growing the M.S. Arch program in tandem with the professional M. Arch. Even though the demand for the program always exceeds admission, the number actually admitted is only 16% of applied due in large part to the loss of space associated with the Seaton Hall renovation project. The Department has successfully tested several methods in recent years, including integrating M.S. coursework with the Kansas City Design Center, aligning M.S. Arch research into the professional graduate studio sequence, bridging curriculum with the College's Ph.D. in Environmental Design, and including practica with regional firms, governmental agencies, and NGOs as an optional part of M.S. Arch coursework in order to grow the program. Finally, in Fall 2017, the Department will be moving into the newly refurbished Seaton Hall, which will allow for the Department to expand the number of admits beyond what is currently supported. Commensurate with these points, the we are recommending that the M.S. Arch program be retained but monitored for improvement over the next three years.

The master's programs in **Chemistry, Mathematics, Physics, and Plant Pathology** are not meeting KBOR criteria for the five-year average of the number of students enrolled and degrees conferred (20 and five respectively). In all of these programs, fewer students enroll in these M.S. programs as experienced students can obtain a Ph.D. directly without an M.S degree. However, the M.S. degree programs benefit from and support their

respective Ph.D. programs as the same courses required to train Ph.D. students are used to train M.S. students and thus, no additional course offerings or infrastructure are needed for the M.S. programs. The M.S. programs must be retained because they each provide good career opportunities for the graduates, help in recruiting Ph.D. students, and in rare cases provide an exit strategy for Ph.D. students who have difficulties in their graduate program. The high caliber of graduates in each of these Departments and their success in obtaining employment more than justify the cost of offering both advanced degrees. These four M.S. programs are recommended for continuation as Graduate Feeder Programs (GFP).

The five-year average number of degrees conferred for the Ph.D. in **Environmental Design & Planning** is slightly below the KBOR minimum of two. However, in the last three years, seven doctoral degrees have been conferred which is an average of a little over two per year. The growth of this program has already begun with two faculty members receiving certification to supervise Ph.D. students, in the past year. These new Ph.D. faculty members will help to expand the range of research topics that can be supported by the program. Two additional faculty members have applied for certification and are awaiting approval by the Graduate Counsel. This will further increase the number of applicants the College can admit. Finally, the College plans to raise the profile of the program by encouraging graduating students to place articles based on their dissertation work in peer-reviewed journals. The College is in a position to build on the early successes, and to institutionalize this unique offering, and thus recommends retaining the Ph.D. program.

The majority of faculty in the Department of **Plant Pathology** have funded appointments in the Agricultural Experiment Station and/or the Cooperative Extension Service, and the teaching portion of their appointment is the minority component of their funded position. Thus, this department does not meet the KBOR minimum criterion for the number of faculty having a 50% or more instructional appointment in the department. However, these are full-time faculty working with the graduate program and undergraduate research on a daily basis, and the total number of faculty exceeds the KBOR program minimum of eight faculty members. Given that these faculty members are contributing to the instruction of both undergraduate and graduate students with limited instructional costs, we request that the minimum criterion for faculty be waived for this departments and program.