2010 NRC Rankings

National Research Council ranks UC Berkeley's Ph.D. programs among nation's best

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Department Rankings

The first detailed survey since 1995 of doctoral programs at the nation's research universities shows that the University of California, Berkeley, continues to have the largest number of highly ranked graduate programs in the country.

The survey by the National Research Council (NRC) — released September 2010, and revised April 2011 — did not assign a single rank to any program, but rather, placed programs within a range, such as between second and sixth place in their discipline. Based on the NRC's statistical analysis, 48 of UC Berkeley's 52 ranked Ph.D. programs placed within a range that included the top 10, compared to 47 of 52 programs for Harvard University, and 40 programs for Stanford University and the University of Michigan-Ann Arbor.

Equally impressive was UC Berkeley's standing among the nation's very best graduate programs. UC Berkeley had 43 programs ranked within a range that extends into the top 5, compared to 40 at Harvard and 30 at Stanford University. Sixteen UC Berkeley programs were assigned an upper range of first place, compared with 19 at Harvard, 11 at Stanford, and seven at five universities (Columbia, Michigan, MIT, Princeton, Yale) that shared fourth place.

The NRC's April 2011 revisions correct four types of errors in its September 2010 report: (1) undercounting first-year students awarded full financial aid; (3) undercounting faculty honors and awards; (2) undercounting new graduates who find employment in academia; and (4) faulty data for nonhumanities faculty's 2002 publications and consequent errors in citation counts.

"We are very proud of our standing, which is validated by our own surveys showing that students come to UC Berkeley for Ph.D.s primarily because of the distinction of our programs and faculty and the public nature of our mission," said Chancellor Robert Birgeneau. "In a recent faculty survey, professors said the quality of the graduate students was the single most important factor in their job satisfaction here. Our faculty and graduate students work together to support our public mission of teaching, research and scholarship for the continued betterment of society. This key symbiosis between our faculty and graduate students makes us distinctive and is at the heart of Berkeley's teaching and research excellence."

The last assessment by the NRC, in 1995, numerically ranked doctoral programs, placing UC Berkeley among the top 10 in 35 of 36 fields. UC Berkeley had the highest number and largest percentage of top-ranked doctoral programs in the nation. In a 1982 study that also involved the NRC, UC Berkeley was ranked the highest, with 30 programs in the top 10.

"This report offers further confirmation that UC Berkeley is the nation's preeminent public university for doctoral studies in a huge number and wide variety of disciplines," said Andrew J. Szeri, dean of the campus's Graduate Division. "Study after study places Berkeley's comprehensive excellence in the top tier of research universities around the country and the world."

Graduate Division Dean Andrew Szeri summarizes results of the NRC rankings at a campus briefing. (Dick Corten photo)

Reaction from campus deans and chairs

"This is fantastic," said **physics chair Frances Hellman** upon hearing that her department was ranked at the top of the list, equivalent to Harvard. "Far from being in 'a state of genteel decline,' as an outside review of the department suggested in 2003, we have a young, vibrant and thriving department."

Hellman, who took over as chair in 2007, has focused on hiring outstanding young faculty and finding ways to help the current faculty and graduate students flourish, despite the budget challenges faced by the university. As changes made in the department over the past decade now come to fruition, "perhaps that means our department today is even better than Harvard's," she speculated.

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The **chair of the economics department,** which in 2005-06 had five Nobel laureates, was understandably pleased that the department's range — third to seventh [between 3 and 8 in the NRC's 2011 revision] — puts it in the company of Harvard, the University of Chicago and MIT. "We are extremely resource-poor, yet we still manage to have a great reputation and be very good at path-breaking research," said **Gerard Roland.**

The department continues to improve, he said, thanks in part to privately sponsored professorships such as the Hewlett Foundation Endowed Chairs, which provide money for research and graduate student support, and other private donations. "Financially, we are in a better situation than we were in 2005-06, and everybody would agree we have gone up in these and other rankings," he said. "I am proud to be chairing this department."

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Reaction from campus deans and chairs

"In 1995, when our department was ranked number 10 by the NRC, I thought that was completely inaccurate," said **Victoria Kahn, chair of comparative literature,** which in the 2010 rankings is placed between 2 and 7 [between 2 and 13 in the NRC's 2011 revision]. "An external review two years ago remarked on how content graduate students and undergraduates were with the program as it exists, and these rankings are just further confirmation of the excellence of the program, the faculty and the graduate students."

Comparative literature is one of the most interdisciplinary departments on campus, encompassing ancient and modern Greek, Latin and Hebrew; Chinese and Japanese; Renaissance French, Spanish and German; and even film. "I think these rankings accurately reflect the strengths of our department, though I'd argue that we should be tied for number one," she said.

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Most departments ranked at the top in 1995 have retained their excellence despite decreased state support over the past decade and deep budget cuts in recent years. "The morale in the department amongst the students and faculty is high, even in these complicated times," said **Lisa Alvarez Cohen, chair of civil and environmental engineering,** whose Ph.D. program ranked second in 1995 and number one today [placed between 1 and 3 in the NRC's 2011 revision]. "We came together, strategized about ways to address the budget challenges while retaining our strengths, and emerged a stronger department. This study shows that we remain a well-balanced group of people with a high level of research activity, and bodes well for continued excellence into the future."

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Data-based assessment

The new NRC report, "A Data-Based Assessment of Research-Doctorate Programs in the United States," synthesized data about more than 5,000 programs in 62 fields at 212 universities with research-based programs. Originally anticipated in 2007, the rankings are based largely on data from the 2005-06 academic year and analyze doctoral programs in the physical sciences and mathematics, agricultural and life sciences, health sciences, engineering, social sciences, and arts and humanities. The voluminous report is online.

The NRC conducts studies for the National Academy of Sciences and the National Academy of Engineering. Its periodic, comprehensive assessments and rankings of American doctoral programs are highly respected among academic institutions and, according to the NRC, provide illustrative benchmarks that "help universities improve the quality of their doctoral programs" and information for students and the public.

While the 1995 NRC rankings were based on a reputational assessment, with academics across the country rating each program, the 2010 report relied heavily on quantitative measures of faculty research activity and quality, of student support and outcomes, and of student and faculty diversity. The data collected included the average time it takes to earn a degree, the percentage of women doctoral students in a program, and the average number of publications per faculty member.

The NRC used 20 such measures to assess each program in two distinct ways. One is based on a regression analysis that correlated these 20 measures of a program's quality with those of top-ranked programs as judged by faculty in the discipline, and then weighted these measures to calculate rankings for programs at all institutions. For the second, survey-based assessment, faculty were asked to rate the relative importance of the different characteristics of doctoral programs directly, and their responses were used to weight these characteristics in judging individual programs.

Though both surveys are based on objective measures of quality, the regression-based method is closer to the NRC's previous ranking method and easier to compare with the 1995 results, Szeri said.

In another departure from past practice, instead of assigning a single numerical ranking, the NRC placed each institution's program within a range of rankings – a 90 percent confidence interval. That means that there is only a 5 percent chance that the program actually ranks higher than the range and a 5 percent chance that it ranks lower. According to the NRC, the results were presented in ranges rather than as single ordinal rankings to better reflect the uncertainty associated with input from different assessors.

Only 52 of UC Berkeley's 87 Ph.D. programs were assessed in the NRC survey. Sixteen (per NRC's April 2011 revision) of these placed within a range that included number one in their field: agricultural and resource economics; astrophysics; chemistry; civil and environmental engineering; computer science; English; epidemiology; German; history of art; mathematics; mechanical engineering; molecular and cell biology: biochemistry and molecular biology; molecular and cell biology: genetics, genomics and development; physics; plant biology; and political science.

Mapping Ph.D. programs to NRC categories

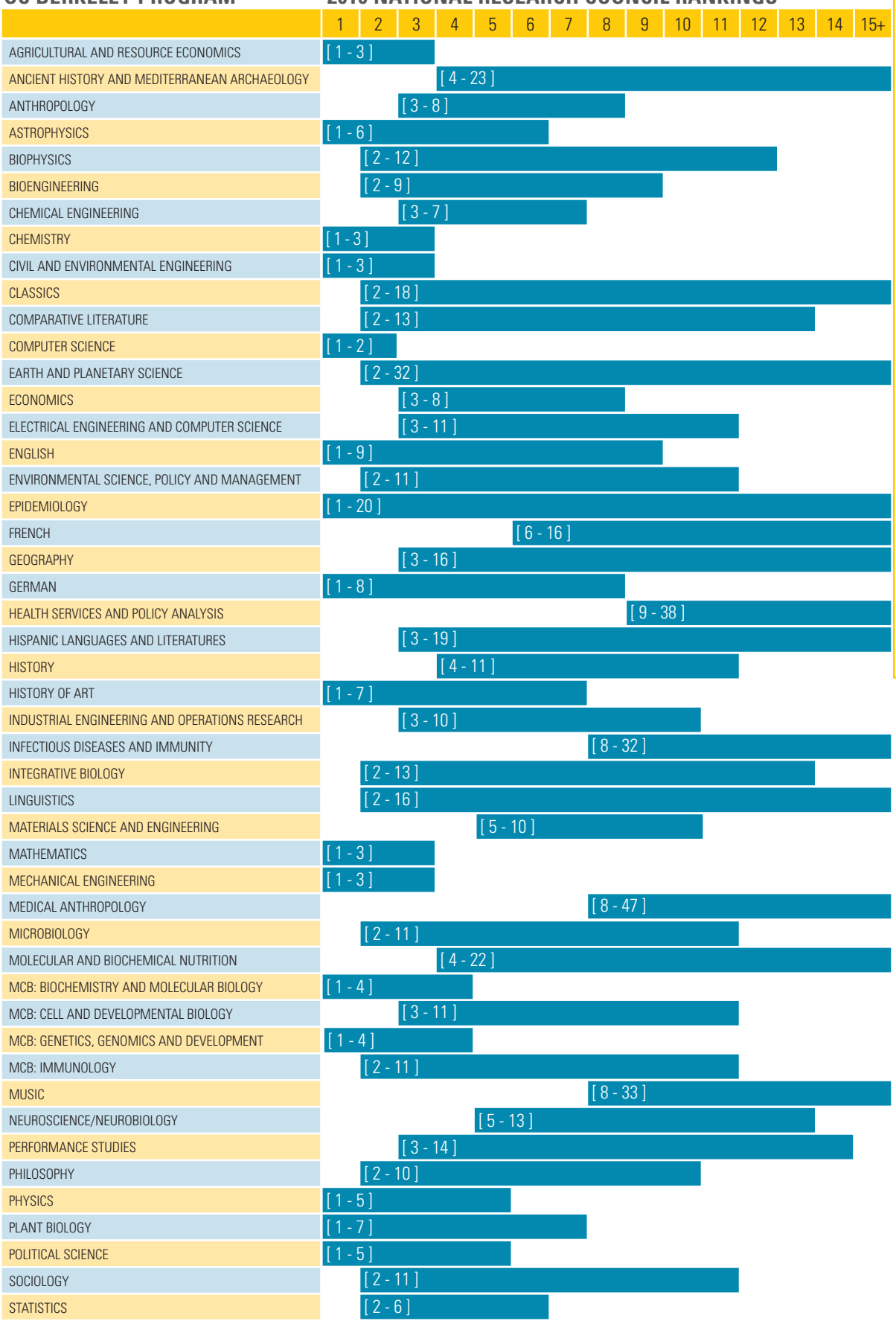
Because UC Berkeley departments or majors did not exactly conform to the 62 fields and 14 emerging fields assessed this year by the NRC (41 fields were rated in 1995 and 32 fields in 1982), degree programs within some departments had to be assigned to different fields. The Department of Molecular and Cell Biology, for example, was split into five categories, requiring the campus to assign some faculty members to one area although their research may actually straddle two or more fields.

In some cases, more than one major at UC Berkeley fit into an NRC field, so each was assessed separately, and hence competed with the others. The campus's departments of integrative biology and of environmental science, policy and management both mapped to the same NRC field of "ecology and evolutionary biology," for example.

Despite the differences between the two assessments, most departments that ranked at the top in 1995 have retained or enhanced their excellence despite decreased state support for UC Berkeley over the past decade and deep budget cuts in recent years. For example, the NRC ranked civil and environmental engineering second in 1995 and within the number one range today.

"The morale in the department amongst the students and faculty is high, even in these complicated times," said Lisa Alvarez Cohen, chair of the Department of Civil and Environmental Engineering. "We

Rankings by department



Ranking doctoral programs at American universities, the National Research Council collected data in 2005-06 on more than 5,000 doctoral programs in 62 fields at 212 colleges and universities. Their analysis assigned each doctoral program a range within which the program likely ranks, such as between first and third for Agricultural and Resource Economics. Below are the 48 UC Berkeley programs (out of 52 ranked) that ranged into the top 10 nationwide, based on a regression analysis involving 20 criteria. The range is indicated in brackets.

Source: National Research Council, 2010: A Data-Based Assessment of Research-Doctorate Programs in the United States *(revised April 2011)*

came together, strategized about ways to address the budget challenges while retaining our strengths, and emerged a stronger department. This study shows that we remain a well-balanced group of people with a high level of research activity, and bodes well for continued excellence into the future."

Other departments were pleased that the new study corrects an earlier, flawed assessment.

"In 1995, when our department was ranked number 10 by the NRC, I thought that was completely inaccurate," said Victoria Kahn, chair of the comparative literature department, which is now ranked between 2 and 7 [between 2 and 13 in the NRC's April 2011 revision]. "An external review two years ago remarked on how content graduate students and undergraduates were with the program as it exists, and these rankings are just further confirmation of the excellence of the program, the faculty and the graduate students."

"I think these rankings accurately reflect the strengths of our department, though I'd argue that we should be tied for number one," she added.

For others, the release of the report is simply a relief.

"This is fantastic," said physics chair Frances Hellman, upon hearing that her department was ranked at the top of the list, equivalent to Harvard's physics ranking. "Far from being in 'a state of genteel decline,' as an outside review of the department suggested in 2003, we have a young, vibrant and thriving department."

Reputation versus objective measures of quality

According to Szeri, the NRC's methodology has both the strengths and weaknesses of another popular survey, the periodic graduate school rankings published by the magazine U.S. News & World Report. This year, the magazine announced that UC Berkeley was the highest ranked public university. Its graduate programs were in the top five in many areas, although undergraduate programs came in at number 22.

"The (NRC) study collected a wealth of information, which allows benchmarking against other universities on measures such as time to degree," Szeri said. "It did also collect and use important data that may be regarded as a proxy for judgments about quality: awards received by faculty members, and the fraction of students with portable fellowships — scholarships that can be used at any institution." UC Berkeley ranks as the top choice of doctoral students who win National Science Foundation Graduate Research Fellowships. The campus is also tops in Javits Fellowships in the Humanities, and is a top producer of Fulbright Fellowships.

"But the focus on quantitative measures over quality – such as the number of publications a scholar has produced rather than how influential the publications are, for example — was troubling.

"So, while I think some of the data will be useful in going forward, I don't think the new rankings form a complete picture of a school's academic excellence."

Other data compiled by the NRC, such as the amount of monetary support available to incoming graduate students, put the campus at a disadvantage in the rankings because, as a publicly supported institution, UC Berkeley must struggle to keep up with elite private universities, Szeri said. In 2007, UC Berkeley offered admitted doctoral students $1,921 less than their top-choice non-UC school per year above the cost of tuition and fees – a shortfall exacerbated by California's higher cost of living. Still, the acceptance rate on offers of admission climbed to 57 percent overall for the year 2009-10, showing that other factors are important. Principal among these is the distinction of the academic programs and faculty.

"State support of the university has declined precipitously in real terms since the NRC's last report in 1995. Diversifying the portfolio of resources that can support excellence in graduate education and research is of great importance to the future of the campus," said Szeri. "The $3 billion 'Campaign for Berkeley,' which has a goal of raising a $340 million endowment for graduate fellowships, will be crucial to help provide a competitive level of support that enables us to attract the very best graduate students."

Major data collection effort

UC Berkeley typically awards more doctoral degrees than any other college or university in the nation. In 2009-2010, it awarded 879 doctoral degrees. The campus has 5,870 Ph.D. students this fall, most of them California residents. This is down just slightly from fall 2009, when there were 5,959 students pursuing doctoral degrees on campus.

Data collection for the new study began in fall 2006, and at UC Berkeley required the involvement of two analysts, along with Szeri, who was associate dean at the time, to coordinate all the information requested by the NRC. There were five questionnaires: one for the institution, one for each program, another for each faculty member in a program, a fourth for doctoral students in each program, and lastly, a questionnaire for faculty members willing to rate programs in their field. At UC Berkeley, with encouragement from the Graduate Division, from the chancellor and from the deans, some 89 percent of the faculty responded, significantly higher than the 70 percent faculty response rate nationwide for all participating schools.

Financial support for the NRC study was provided by the National Institutes of Health, the National Science Foundation, the Alfred P. Sloan Foundation, the Andrew W. Mellon Foundation and the participating universities, which paid on a sliding scale based on the number of Ph.D.s they award. UC Berkeley, for example, paid $20,000 to participate because it awards more than 100 doctoral degrees per year. ◆

Reaction from campus deans and chairs

Many areas within the Department of Molecular and Cell Biology fared extremely well. Genetics, genomics and development, ranked 10th in 1995, is now between second and sixth [between 1 and 4 in the NRC's 2011 revision], while biochemistry and molecular biology, fourth in 1995, is now ranked between first and sixth [between 1 and 4 in the NRC's 2011 revision]. Biomedical areas, in particular, ranked high. "The fact that UC Berkeley competes so successfully with the big medical meccas speaks well for the quality of the science and the attractiveness of the training," said **Mark Schlissel, dean of the biological sciences.**

One of Berkeley's strengths and an attraction to students is that "we don't make students commit, on their way in the door, to a particular narrow subject area, but rather, we give them the choice of the whole landscape of modern biology, with perhaps a hundred different vigorous research programs to consider."