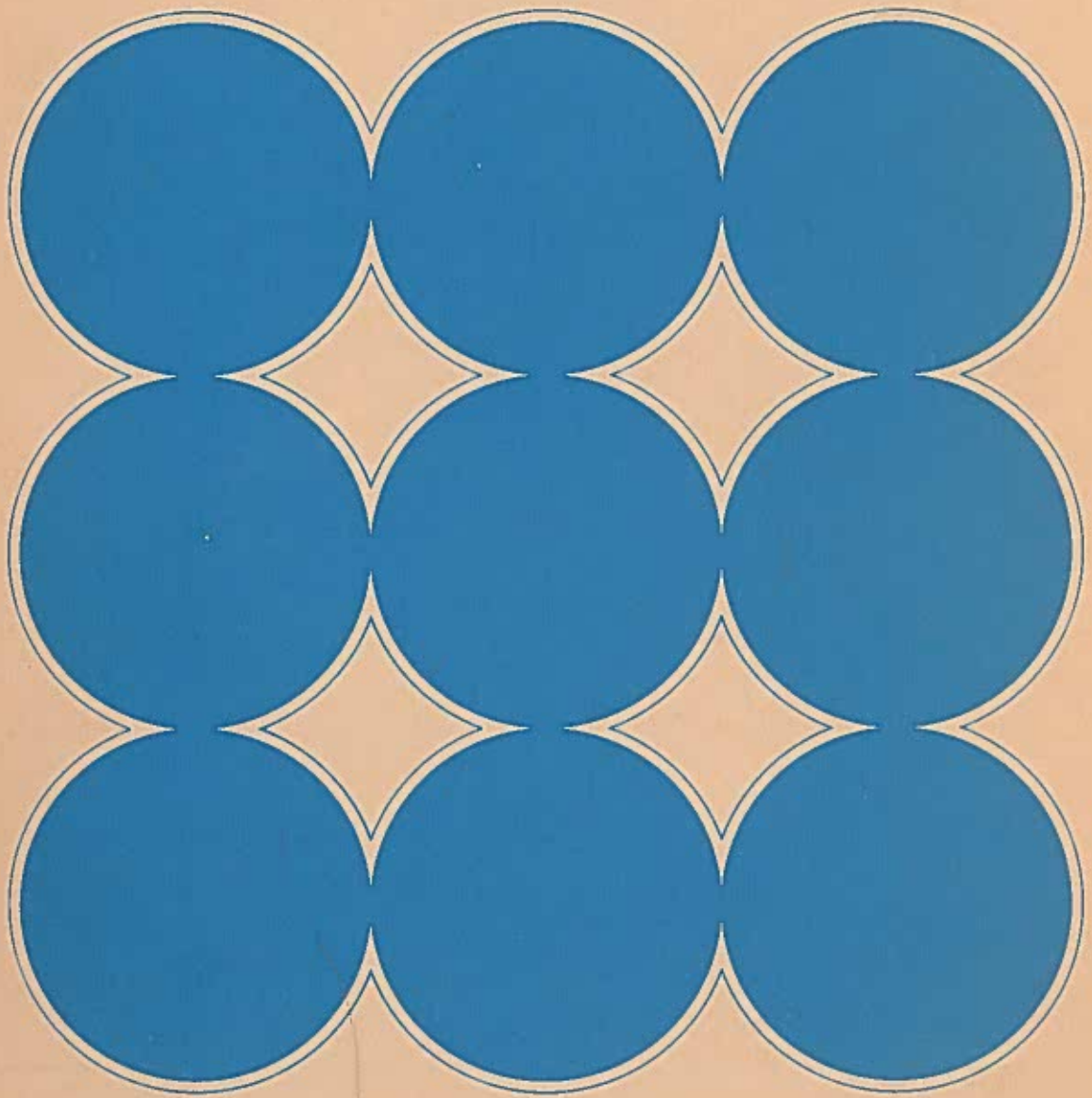
University of California

Academic Plan 1974-1978



University of California

Academic Plan

1974-1978

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PREFACE

The Academic Planning and Program Review Board is the University body assigned the important responsibility of developing and recommending to the President an Academic Plan for the University of California. In the course of its work over the past two years, the Board has consulted extensively with campus administrations, Academic Senate committees, student body organizations, and many individual faculty members, students, and administrators. Vice President of the University Chester O. McCorkle, Jr., is Chairman of the Academic Planning and Program Review Board. Other members who served on the Board during a part or all of the two-year period are:

Administrative officers -- James Albertson, Robert Evans, Loren Furtado, Richard B. Grenfell, William Lewis, Joseph W. McGuire, Wilson K. Talley and Angus E. Taylor.

Faculty members -- Eric E. Conn, Jack DeGroot, Robert Dubin, John S. Galbraith, Edwin S. Gaustad, and Ira M. Heyman.

Student members -- Robert Ellis, David Ernst, Frank Heyming, George Hohnsbeen, and Suz Rosen.

While the President of the University accepts final responsibility for the University Academic Plan for 1974-78 in its present form, I wish to acknowledge the University's gratitude and my own to the APPR Board and to the many other members of the University community who have contributed to the accomplishment of this assignment.

Charles J. Hitch, President
University of California
March, 1974

INTRODUCTION

This new University Academic Plan for 1974-78 contains substantial changes from the last University Academic Plan issued in early 1969. These changes arise primarily from the dramatic downward shift in state and national population growth rates disclosed in the 1970 Census, just one year after issuance of the prior Plan. A secondary cause is the reduction in the rate at which the financial resources available to the University have been increasing -- a reduction associated both with the slower growth rates and with the rapid rise of competing demands upon State funds for other urgent social needs.

The current University Growth Plan, adopted in mid-1972 after extensive study of these changing conditions, established new growth rate estimates for the University campuses which were substantially lower than those contemplated in earlier plans. This present document reviews the University's academic goals and objectives in the context of these new expectations. It also describes the new planning and program review processes which have been developed and are still evolving to meet the need for better coordination between campus and University-wide planning and between planning and resource allocation. The document does not attempt an exhaustive review of all aspects of the University's academic activities; rather, it focuses upon those features which require re-examination and, in some cases, reshaping to fit the needs of the 1970s.

The University Academic Plan is not in itself an operational plan; it does not set forth proposals and recommendations about specific academic programs. Those will be contained in the Campus Academic Plans which will result from the processes described here. It is the individual Campus Plans and this present document taken together which will constitute the operating Academic Plan for the University of California.

Prior Academic Plans have customarily looked forward over a period of ten years. The current University Academic Plan attempts to speak for the next four or five years (although enrollment projections are carried forward for the usual ten-year period). The sharp changes in expectations which have taken place between the issuance of the 1969 Academic Plan and now, and even between the adoption of the University Growth Plan in 1972 and now, have demonstrated the difficulty of making longer-range academic plans in an era of such rapid change. Even the shorter-range Plan should be seen only as an evolving outline, subject to appropriate revision in response to shifting circumstances.

In actuality, of course, academic planning is a continuous process, much of it implicit in the on-going discoveries of scholars, the changing demands of students, the shifting program emphases of instructors and of departments, the day-to-day decisions of administrators. But a periodic, more explicit planning effort encourages a longer perspective, a broader scope, and a more consciously directed evaluation of institutional goals and directions. The University Academic Plan for 1974-78 represents such an effort.

UNIVERSITY PLANNING OBJECTIVES FOR THE 1970s

The University of California is the pioneer among major institutions of higher learning in the development of the multi-campus concept. No other institution in the United States has achieved on so broad a scale the creation of an entire series of university-level campuses. These campuses, now eight in number in addition to the specialized San Francisco campus devoted to the health sciences, are diverse in their academic programs and the stages of their growth, but they share common standards of excellence and common goals for the achievement of high scholarly quality. Each campus applies the same rigorous criteria to the selection of its students and the appointment and promotion of members of its faculty.

Although the origin of the multi-campus concept goes back much earlier in University of California history, the major development of the system took place during the period of rapid enrollment growth in the 1960s. It was then that the concept demonstrated most dramatically its worth to the State of California, as new university-level facilities and even new campuses with the imprint of University of California quality were developed to meet the new enrollment demands in a fraction of the time that new universities have customarily required.

Now the era of rapid physical expansion has passed; but the rapid growth of knowledge itself continues. The University of California must maintain its position at the forefront of the pursuit and transmission of knowledge, using and continuing to build upon its multi-campus design to accomplish this purpose. To this end, three academic planning objectives are paramount for the 1970s:

1. The University of California will strengthen its over-all academic planning and review processes to assure that all university-level programs of recognized scholarly and professional importance are presented somewhere within the institution; their distribution and development on the several campuses will be planned to achieve a total spectrum of University offerings of breadth and quality not attainable in a single-campus institution of higher learning.

   The slower growth of the 1970s will require harder planning choices and the establishment of clearer priorities throughout the University. It will also require more active consideration at the Universitywide level of the distribution of programs and resources among campuses. The section in this document on "Academic Planning and Program Review Processes" will speak particularly to the accomplishment of this objective.

2. The University considers it imperative to preserve the intellectual vitality and dynamism of the mature campuses in their new steady-state conditions.

   The Berkeley and Los Angeles campuses are already at their maximum planned enrollment ceilings, and the Davis campus nearly so. Future physical growth will no longer provide the principal means for the introduction of new programs and new faculty members. If these campuses are to maintain and build on the levels of distinction they have already achieved, scholarly growth and change will have to take place through the more difficult means of replacement and redirection of activities and re-allocation of resources. Sections of the document on program review and faculty renewal and the individual campus profiles will be particularly relevant to the achievement of this objective.

3. The University considers it equally imperative to continue strengthening the academic development of the growing campuses.

Almost all the future enrollment growth of the University will have to occur at Irvine, Riverside, San Diego, Santa Barbara, and Santa Cruz. The new demographic data make it clear that their growth in the immediate future will not be nearly as rapid as was predicted in the 1960s. By the end of the current planning period in 1977-78, however, almost two out of every five University of California students will be enrolled on the growing campuses. And the time may well come when these campuses have to accommodate the majority of all the University's students. It is essential, therefore, that the growing campuses achieve appropriate academic balance and that they continue to build on their own areas of unusual curricular strength, preserving sufficient flexibility and momentum to absorb both the slower growth of the immediate future and the more extensive University growth of the longer range. Sections of the document on enrollment projections, undergraduate, graduate, and professional education, and the individual campus profiles will relate especially to this objective.

The University cannot afford to drain essential resources from the mature campuses to support a substantial rate of expansion on the growing campuses. By the same token, the University cannot afford to foreclose the scholarly development of the growing campuses in order to protect at all costs the distinction of the mature campuses. The most thoughtful and imaginative efforts at academic planning and resource allocation will be needed to keep pace with the intellectual demands of the times and to strike a proper balance in support among the individual campuses that make up the University of California. Finding and maintaining that balance will be the central planning issue of the 1970s.

BASIC ASSUMPTIONS

The following basic assumptions about circumstances and policies, internal as well as external to the University, have guided the drafting of the University Academic Plan. Some of them are implicit in the Plan, since they are sufficiently familiar to members of the University community to preclude the need for additional discussion at this time. Others, which involve new directions or necessary adaptation to changing circumstances, will be discussed in more detail in later sections of this document.

* The distinctive mission of the University is to serve society as a center of higher learning, providing long-term societal benefits through transmitting advanced knowledge, discovering new knowledge, and functioning as an active, working repository of organized knowledge. That obligation, more specifically, includes undergraduate education, graduate and professional education, research, and other kinds of public service, which are shaped and bounded by the central and pervasive mission of discovering and advancing knowledge.

* The State needs and can afford a distinguished public university of the quality, scope, and size of the University of California. California's expenditures for public higher education are roughly comparable with those of other industrial states, and should remain so in view of the fact that higher education -- including the University -- contributes so greatly to the State's development. But the increase in other urgent social demands on the public purse must be recognized as a factor in planning for the University's future.

* The autonomy and independence of the University, which are essential to the excellence of the institution, will continue to be respected and protected by the people of the State. The University, on its part, fully accepts the obligations and opportunities of its public trust and will be accountable to the public.

* Differentiation of function among the three public segments of higher education in California will continue in substantially its present form, within the coordinating structure of the new State Commission on Postsecondary Education. Intersegmental cooperation will be pursued wherever it will enhance institutional missions.

* Diversification among the several campuses will continue to be encouraged so that students may have a broad choice of program emphases, social and physical environments, and instructional modes.

* The presence on a University campus of students of all levels -- lower division through postdoctoral -- contributes to a favorable learning environment for able and motivated students. Therefore, students from all levels will continue to be accepted at each of the University's general campuses, though the mix will differ from one campus to another.

* The University will continue its policy of accepting all qualified undergraduate California students, including transfer students, on some campus, and will intensify efforts to improve the process of redirecting those who, because of

limitation of resources, cannot be accommodated on the campus of their first choice.

* With due regard to its responsibility to educate California residents, the University will continue to admit very highly qualified out-of-State students at all levels, particularly at the graduate and professional levels.

* The University will provide educational opportunities to an increasingly broad cross section of potentially able California students as a part of its overall commitment to affirmative action. All University students will be expected to meet the same high standards of academic performance.

* The University will continue to assist qualified individuals to enroll, through the provision of financial aid from its own funds and through efforts to develop or expand other sources of financial aid.

* At the undergraduate level, the University will continue to offer general education emphasizing humanistic values and the development of basic analytical skills that will make possible intelligent responses to the unknown questions of the future rather than narrow vocational training based on short-term views of manpower. At the same time, the University has the responsibility to help students make informed career choices.

* Graduate and professional programs will continue to be planned by the University on the basis of developments in knowledge and intellectual perspectives, taking account of student demand, available resources, and changing social needs insofar as they can be perceived.

* The University will respond to the public's desire for increased opportunities to pursue degree programs on a part-time basis through its new Extended University, and to take continuing professional training and other kinds of educational courses offered by University Extension.

* Basic research will continue to be a prime University responsibility. At the same time, the University will seek to make its expertise more readily available for the solution of contemporary problems. As one of a limited number of research universities in the United States, this University must be responsive to Federal as well as State priorities. But the University will continue to be the principal research agency for the State's needs in such areas as environmental problems, water, energy, agriculture, health fields, and traffic and other engineering matters.

* Recent demographic trends and other factors such as rising educational costs and changing student perceptions of the job market are resulting in lower enrollment projections, and the University must base its planning upon these expectations of slower growth.

* As growth rates slow and some campuses reach the steady state, the University must maintain its ability to respond to changing needs. Crucial to this ability are its human resources; thus, great flexibility in the use of faculty and staff positions within the total University and on the individual campuses is essential.

* In the design and development of its campuses, the University will take into account as an important planning factor the physical, economic, and social impacts of those campuses on their surrounding communities.

* In the appointment and promotion of both academic and staff personnel, the University will follow a program of affirmative action for minorities and women which is responsive to moral obligations, in compliance with all legal requirements, and consistent with University standards of quality.

PROSPECTS FOR THE 1970s

New demographic trends and related shifts in the levels of fiscal resources are the primary changes affecting the environment and the planning needs of the University of California in the 1970s.

Enrollment Projections

The University's 1966 and 1969 Academic Plans were based on much higher projections of student enrollment than are currently expected. The earlier projections assumed a continuation of the demographic trends and the pattern of in-migration to California experienced in the 1950s and early 1960s. But the 1970 Census disclosed sharply downward shifts in both the birth rates for the nation as a whole and the in-migration rates for California. The University's Growth Plan Task Force reported in mid-1971 that demographic data indicated that the University would need to grow -- but at a declining rate -- during the 1970s to accommodate future students still in high school or elementary grades, but that growth might cease altogether for a time in the decade of the 1980s. More recent data have indicated the need for scaling enrollment projections downward somewhat further than was done in the Growth Plan Task Force Report.

Tables 1 and 2 show the University's most recent ten-year projections for general campus enrollments and health sciences enrollments. The tables taken together project a total enrollment growth for the University of about 20 percent over the decade of the 1970s. By contrast, actual University enrollment growth between 1960 and 1970 amounted to 119 percent.

The University's 1969 Academic Plan, anticipating a continuation of rapid enrollment growth, established "planned maximum enrollments" of 25,000 to 27,500 students each for the growing campuses -- Irvine, Riverside, San Diego, Santa Barbara, and Santa Cruz -- and estimated that these ceilings would be reached between 1980 and 2000. The current Academic Plan does not attempt to set maximum enrollments for these campuses. But it is clear that the high figures of the 1969 Plan are no longer relevant for planning purposes on these campuses. Instead, campus planning will be based on the current ten-year projections, and kept sufficiently flexible so that a campus can adapt as needed to changes downward or upward in the projections as they are revised and extended year by year.

New ten-year projections are prepared by the University each spring. Each campus makes a tentative projection which incorporates its own plans and expectations, and the Office of the Vice President - Planning prepares a projection for the University as a whole and for the campuses, using State Department of Finance demographic data, information on application trends, estimated results of redirection among the campuses, and other materials. Differences between Universitywide and campus projections are discussed and usually resolved, and the Universitywide Enrollment Advisory Committee then reviews the projections and makes its recommendations to the President, who establishes and issues the University's official ten-year enrollment plan. The near-year figures are used for preparation of the University's Operating Budget. The long-term projections are used for preparation of the Capital Outlay Budget. In addition, the projections are used for planning purposes by the APPR Board and other groups throughout the University, and to some extent by governmental bodies and civic and commercial interests in the surrounding communities.

Table 1

THE UNIVERSITY OF CALIFORNIA

GENERAL CAMPUS ENROLLMENTS [1]

Ten Year Enrollment Projection [2] (3-Term Headcount [3])

	1970-71 Actual	1971-72 Actual	1972-73 Actual	1973-74 Estimate	1974-75 Budget	PROJECTED (Rounded to the Nearest 100) 1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
BERKELEY													
Undergraduate	18,361	18,101	18,874	18,781	19,032	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000
Graduate	9,068	8,528	8,483	8,181	8,166	8,200	8,200	8,200	8,200	8,200	8,200	8,200	8,200
Total	27,429	26,629	27,357	26,962	27,198	27,200	27,200	27,200	27,200	27,200	27,200	27,200	27,200
DAVIS													
Undergraduate	9,651	10,045	10,927	11,075	11,500	12,100	12,100	12,100	12,100	12,100	12,100	12,100	12,100
Graduate	2,504	2,658	2,835	2,835	3,000	3,200	3,300	3,600	3,800	3,900	4,000	4,100	4,100
Total	12,155	12,703	13,762	13,910	14,500	15,300	15,400	15,700	15,900	16,000	16,100	16,200	16,200
IRVINE													
Undergraduate	4,743	5,050	5,576	5,628	5,755	6,000	6,200	6,400	6,600	6,700	6,900	7,000	7,100
Graduate	736	882	904	950	1,000	1,000	1,100	1,100	1,200	1,200	1,300	1,300	1,400
Total	5,479	5,932	6,480	6,578	6,755	7,000	7,300	7,500	7,800	7,900	8,200	8,300	8,500
LOS ANGELES													
Undergraduate	17,187	16,695	18,082	19,185	19,312	19,100	19,000	19,000	19,000	19,000	19,000	19,000	19,000
Graduate	8,227	7,484	7,538	7,697	7,605	7,800	7,900	8,000	8,000	8,000	8,000	8,000	8,000
Total	25,414	24,179	25,620	26,882	26,917	26,900	26,900	27,000	27,000	27,000	27,000	27,000	27,000
RIVERSIDE													
Undergraduate	4,428	4,535	4,062	3,615	3,393	3,800	4,200	4,600	4,800	4,800	4,800	4,800	4,800
Graduate	1,289	1,345	1,173	1,210	1,300	1,300	1,400	1,400	1,400	1,500	1,500	1,500	1,500
Total	5,717	5,880	5,235	4,825	4,693	5,100	5,600	6,000	6,200	6,300	6,300	6,300	6,300
SAN DIEGO (Includes Marine Sciences)													
Undergraduate	4,174	4,635	5,183	5,604	6,169	6,800	7,300	7,600	8,000	8,000	8,000	8,000	8,000
Graduate	1,149	987	1,155	1,141	1,248	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100
Total	5,323	5,622	6,338	6,745	7,417	8,200	8,800	9,200	9,700	9,800	9,900	10,000	10,100
SANTA BARBARA													
Undergraduate	11,232	10,578	10,078	10,079	10,224	10,600	10,900	11,200	11,500	11,800	12,000	12,000	12,000
Graduate	1,777	1,661	1,750	1,772	1,776	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600
Total	13,009	12,239	11,828	11,851	12,000	12,500	12,900	13,300	13,700	14,100	14,400	14,500	14,600
SANTA CRUZ													
Undergraduate	3,446	3,903	4,349	4,965	5,210	5,600	5,800	6,000	6,200	6,400	6,600	6,800	6,800
Graduate	267	305	282	390	450	500	500	600	600	700	700	700	700
Total	3,713	4,208	4,631	5,355	5,660	6,100	6,300	6,600	6,800	7,100	7,300	7,500	7,500
TOTAL GENERAL CAMPUS													
Undergraduate	73,222	73,542	77,131	78,932	80,595	83,000	84,500	85,900	87,200	87,800	88,400	88,700	88,800
Graduate	25,017	23,850	24,120	24,176	24,545	25,300	25,900	26,600	27,100	27,600	28,000	28,300	28,600
Total	98,239	97,392	101,251	103,108	105,140	108,300	110,400	112,500	114,300	115,400	116,400	117,000	117,400

[1] Health Science and Extended University enrollments are excluded.

[2] Subject to annual review during March.

[3] 3-term headcount is the average of enrollments for the Fall, Winter and Spring Quarters. Peak enrollments occur during the Fall Quarter.

Table 2

THE UNIVERSITY OF CALIFORNIA

HEALTH SCIENCE ENROLLMENTS

Ten Year Enrollment Projection (3-Term Headcount)

	Actual[1] 1970-71	Actual[1] 1971-72	Actual[1] 1972-73	PROJECTED[2] 1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	Steady State Beyond 1979-80
BERKELEY											
Optometry	203	223	231	240	240	245	258	272	282	289	292
Public Health	253	267	284	313	345	375	400	415	415	415	415
Total	456	490	515	553	585	620	658	687	697	704	707
DAVIS											
Family Nurse Practitioners	-	18	32	65	65	65	65	65	65	65	65
Medicine	356	516	639	665	790	830	905	980	1,065	1,100	1,100
Veterinary Medicine	420	464	482	486	521	540	583	633	688	738	747
Total	776	998	1,153	1,216	1,376	1,435	1,553	1,678	1,818	1,903	1,912
IRVINE											
Community & Public Health Programs	-	-	-	2	2	8	14	24	32	44	44
Medicine	580	613	661	708	729	773	876	905	939	981	1,011
Total	580	613	661	710	731	781	890	929	971	1,025	1,055
LOS ANGELES											
Dentistry	376	400	420	449	487	501	509	513	513	513	513
Medicine	1,477	1,646	1,798	1,883	1,913	1,943	1,943	1,943	1,943	1,943	1,943
Nursing	218	214	258	258	258	270	285	297	307	316	330
Public Health	308	364	385	425	433	438	443	448	458	468	478
Total	2,379	2,624	2,861	3,015	3,091	3,152	3,180	3,201	3,221	3,240	3,264
RIVERSIDE											
Medicine	-	-	-	-	-	21	42	42	42	42	42
SAN DIEGO											
Medicine	353	455	618	660	724	767	798	829	860	860	860
SAN FRANCISCO											
Dentistry	382	400	418	437	450	458	500	538	562	588	588
Human Biology	-	-	-	-	80	110	140	170	200	230	230
Medicine	1,300	1,357	1,421	1,444	1,478	1,509	1,534	1,559	1,584	1,584	1,584
Nursing	469	485	545	560	543	545	547	549	551	552	552
Pharmacy	400	405	425	443	460	483	505	527	539	551	551
Total	2,551	2,647	2,809	2,884	3,011	3,105	3,226	3,343	3,436	3,505	3,505
UNIVERSITYWIDE TOTAL	7,095	7,827	8,617	9,038	9,518	9,881	10,347	10,709	11,045	11,279	11,345

[1] Statistical Summary.

[2] Approved Feb. 28, 1973, later revisions not included.

1/28/74

Tables 1 and 2, then, are the projections which were issued in the spring of 1973 (with some minor revisions). A new set of projections will be available shortly after this Academic Plan is issued. It should be emphasized that the figures do change somewhat each year and are not to be read as long-term commitments. Actual enrollments may reveal unexpected shortfalls or may considerably exceed estimates, and projections are revised annually to reflect actual enrollment experience and other factors.

Undergraduate Enrollments - The University admits all qualified undergraduate applicants from California (on their preferred campus, if possible, or on an alternate campus through the redirection process), and offers admission to exceptionally able applicants from outside the State. State demographic trends are a major determinant of undergraduate enrollments. About 90 percent of the University's entering first-year students are recent graduates of California high schools. The Population Division of the State Department of Finance provides the University each year with projections of State high school graduates by county. These projections, when combined with trends in applications from individual California counties and similarly derived information for transfer students and for out-of-State applicants, are used in projecting enrollments for each campus. Where the resultant campus totals are projected to exceed either temporary capacity or permanent enrollment ceilings, the projected excess applicants are distributed to campuses where facilities are available. Past experience with redirection indicates that only about 30 percent of redirected applicants register at the new campus, as compared with 50 percent of applicants who actually enroll at the campus of their first choice. The University hopes to improve its redirection process, especially through redirection earlier in the year, with the expectation that earlier redirection will result in higher rates of acceptance of new campus assignments.

Table 3 (see following page) shows the Department of Finance "Provisional Projections of Public High School Twelfth Grade Graduates" for California for the current planning period. Two sets of figures are given: those dated April 1972 which were used in preparing Table 1 in March of 1973, and those dated July 1973 which will be used in the University's preparation of the next set of ten-year projections in March of 1974. It should be noted that the more recent figures project lower numbers of high school graduates throughout every year of the planning period than did the April 1972 data. Both sets of figures show 1979 as the peak year for high school graduates, with numbers declining thereafter and by fairly large amounts in the early 1980s. These data are reflected in the undergraduate projections in Table 1, which show much slower growth after 1980-81. It is possible that actual declines will occur in the mid-1980s, when the full effects of declining numbers of high school graduates are felt.

The University's undergraduate projections (Table 1) assume that the application rate of high school graduates will remain about the same during the 1970s. It is possible that the University's student clientele will be broadened over time (see discussion of this topic in the later section on "Some Special Concerns for the 1970s"). At present, the numbers involved in this area, when compared to the total enrollments at the University, do not warrant changes in the current projections.

Table 3
PROVISIONAL PROJECTIONS OF CALIFORNIA PUBLIC SCHOOL
TWELFTH GRADE GRADUATES

Total for Year ending June	As revised April 1972	As revised July 1973
1972	294,175	291,496
1973	296,375	287,075
1974	303,850	294,800
1975	312,150	303,375
1976	310,250	303,075
1977	313,275	307,850
1978	318,475	313,425
1979	322,375	317,725
1980	318,600	313,875
1981	311,750	306,575
1982	305,725	301,475
1983	289,825	284,650
1984	--	268,500

Source: Population Division, California State Department of Finance

Undergraduate admissions may be constrained at campuses either because of established enrollment ceilings or temporary limits on capacity. The following planning ceilings for three general campuses are currently in effect:

	Three-term Headcounts		
	General campus	Health Sciences	Total
Berkeley	26,900	600	27,500
Davis	16,200	2,000	18,200
Los Angeles	27,000	3,000	30,000

An enrollment limit of 7,500 for the Santa Cruz campus is in effect for the present ten-year projection period.

Davis is rapidly approaching its ceiling and both Berkeley and Los Angeles are at their ceilings. Table 1 indicates that current projections for general campus enrollments at Berkeley are slightly in excess of established ceilings, and Table 2 shows a similar excess in projections of health sciences enrollments at Berkeley and Los Angeles. These campuses are expected to adjust actual enrollments to conform to ceilings as soon as possible. It should be noted that actual enrollments may never agree precisely with ceilings because of annual variations in the percentage of students offered admission who actually enroll.

Temporary constraints on undergraduate enrollments may be required at one time or another either because of lack of capacity, or because slower rates of growth are deemed advisable to assure high academic quality. In determining their rates of growth, the campuses take into account their physical, economic, and social impacts on their surrounding communities.

One other important question, and one that is resolved by the Office of the President after consultation with campus administrators, is the distribution of campus total enrollment capacities between undergraduate and graduate enrollments.

Graduate Enrollments - Graduate enrollments are determined separately and somewhat differently from undergraduate enrollments. The University has exclusive responsibility among the State's public institutions for instruction at the Ph.D. level and in certain professional fields, and it shares responsibilities for training at the Master's degree level and in other professional fields. Graduate students are drawn in considerable numbers from other states as well as from California. Demographic factors have their effect on graduate enrollments, both directly and indirectly through their effect on undergraduate enrollments and thus on the level of future demand for doctoral degree holders as teachers of undergraduates in colleges and universities. The Growth Plan Task Force in 1971 suggested a substantially smaller growth rate for graduate enrollments than had been envisioned in earlier Academic Plans, and noted several causes: prospective lower employment demand for individuals with Ph.D. and some other postgraduate degrees; decline in financial aid for graduate students; and the effects of increased educational fees and of higher tuition fees for out-of-State students, along with limited availability of non-resident tuition waivers.

The graduate enrollments in Table 1 have been established by the Office of the President after consultation with the campuses, and reflect estimated student demand, developments in the various fields, program costs, placement opportunities in the fields, and campus and Universitywide program priorities at the graduate level. The graduate enrollments are considerably lower than those of the 1969 Academic Plan and somewhat lower than those contained in the Growth Plan Task Force Report. Both they and the undergraduate projections are, of course, subject to change annually in March.

Factors That May Change Projections - The current projections assume that certain policies and conditions will remain relatively constant. But it is possible (and likely) that unexpected changes will occur. Slightly less than half of the California students eligible to attend the University of California do in fact enroll, and this proportion could increase (or decrease) over the next decade. The following are illustrative of the range of possible changes:

1. Proportions of students seeking college education may change. Social pressures for attending college seem to be weakening somewhat, and pressures for vocational training increasing. These pressures may cause a decrease over time in the proportion of high school graduates seeking admission to the University. Or, again, policies further encouraging the attendance of minorities and women might raise these proportions measurably. Increased enrollment opportunities for part-time or older students and reliance on some non-traditional criteria for their admission might add to the numbers.

2. Tuition and educational fee policies may change. If the University fees are raised, enrollment demand will fall somewhat. If, however, tuition or substantial educational fees were to be introduced in the State University and Colleges, some students who now go to these institutions because of the absence of such fees might elect to attend the University.

3. Financial aid patterns may change. For example, the federal government's new Basic Opportunity Grants are now funded only to a limited extent. Full funding, as recently requested by President Nixon, might enable some students to attend the University who now attend community colleges primarily for financial reasons.

4. Basic demographic trends might change if, for example, the energy crisis should persist and should encourage a wave of new in-migration to California because of the State's mild climate.

The University has the obligation to choose from among the many possibilities those that seem to be the most realistic assumptions about the future, to project its enrollments according to those assumptions, and to formulate its future academic plans and its budgets in the light of current projections.

Fiscal Outlook

State support is always related in some measure to enrollments, and the prospect for slower enrollment growth means also the prospect for slower growth in fiscal resources. Beyond that, the University in recent years has not received general fund support from the State commensurate with the growth of enrollment. Instructional support per student on the University's general campuses, in terms of 1972-73 dollars, declined by 27 percent, from approximately $2,830 per student in 1960-61 to $2,080 per student in 1973-74. There was some falling off of instructional support per student prior to 1966, but the major downturn has occurred since then. One effect of this fiscal situation has been a steady deterioration in the student/faculty ratio, as the University has been unable to add faculty to keep pace with the rise in enrollments.

The fiscal situation faced by the University is not unique among institutions of higher education in the 1970s. The costs of higher education everywhere have risen rapidly, both because of inflation and because higher education does not have the same ability as most of industry to offset rising costs with rising productivity -- there seem to be few shortcuts to the production of a highly educated individual. At the same time, state legislatures are besieged by pressures to meet other social needs with high priorities, in such areas as health and welfare and environmental protection. This means that the University must make special efforts to use its resources as wisely and efficiently as possible. The University must also seek to demonstrate to the State that the need for a highly educated citizenry is as important as many other social goals and that the University will return invaluable economic and social benefits in exchange for the State's investment.

ACADEMIC PLANNING AND PROGRAM REVIEW PROCESSES

The changes in the patterns of University growth foreseen in the Report of the Growth Plan Task Force in June of 1971 pointed to the need for new and better coordinated planning and review processes. In its conclusion, that Report stated:

> The sketch-like characteristics of this Growth Plan and the tentative nature of many of the suggestions which it puts forward emphasize the need for continuing and detailed planning within the University, particularly in the form of carefully considered and detailed Academic Plans for the campuses and for the University.

The Academic Planning and Program Review Board

In late 1971, the President established an Academic Planning and Program Review Board, composed of faculty members, students, and administrative officers, to serve as the single integrated planning mechanism at the Universitywide level, replacing other units which had had partial responsibilities in budget and academic planning areas. The APPR Board provides the President with advice and counsel, and is specifically charged with:

1. Preparation of a format and guidelines for campus academic plans.
2. Review and coordination of campus academic plans and campus proposals for new academic programs.
3. Preparation of the University Academic Plan.
4. Preparation and revision of University Growth Plans.
5. Review of University offerings in the various disciplines and professional fields.
6. Preparation of operating and capital outlay budget recommendations to the President.

Members of the APPR Board are:

Vice President of the University (Chairman)
Vice President -- Academic Affairs (Vice-Chairman)
Vice President -- Planning (Director)
Assistant Vice President -- Planning and Director of Budget
Assistant Vice President -- Physical Planning and University Architect
Assistant Vice President -- Academic Planning and Program Review
Director of Analytical Studies (Secretary)
Four members from the faculty
Two undergraduate students
One graduate student

The faculty members are appointed by the President from among nominations made by the Academic Council of the Academic Senate. Student members are selected by the President from among names submitted by the Student Body Presidents' Council.

The Board maintains liaison with the Academic Council and committees of the University-wide Academic Senate through the Vice President -- Academic Affairs. Liaison with the Student Body Presidents' Council is maintained by the Assistant Vice President -- Academic Planning and Program Review. The President has instructed the Board to consult broadly with campus administrations, the Academic Senate, and representative student groups in carrying out its charge.

The Planning Process

The primary goal of the planning process throughout the University is to develop and maintain a comprehensive operational plan consisting of an up-to-date University Academic Plan and Academic Plans for each campus. The University Academic Plan provides an overview of the University and its general directions of development and a framework for drafting of Campus Academic Plans. The framework should be sufficiently flexible so that campus options and initiatives are not unduly limited. Campus Academic Plans are drawn up by individual campus administrations in consultation with appropriate representatives of faculty and students on the campus, and are then reviewed and approved by the APPR Board for submission to the President. It is the campuses that are involved in the actual execution of academic programs, and the campuses have detailed knowledge of the individual activities, problems, and capabilities on the campus not readily available at the Universitywide level. The Campus Academic Plans must be detailed enough to serve as guides to budget preparation.

The continuing availability of a realistic University Academic Plan will permit the periodic revision of effective Campus Academic Plans; and the continuing existence of detailed Campus Academic Plans will simplify the necessary updating of the University Academic Plan.

As is the case with the most recent Universitywide plan (1969), existing campus plans are out of date in varying degrees. Moreover, they were generally uncoordinated on a Universitywide basis in their development. These circumstances have led to a broad new planning effort and provided the opportunity for introduction of a new, coordinated planning process.

The planning process now emerging is essentially a succession of interactions between the campuses and the APPR Board, taking place in three general steps but with much more consultation between the campuses and the Universitywide level than this outline of the process suggests.

Step I - Because enrollments are one of the most important factors in the planning process, the planning cycle begins with the University's current ten-year enrollment projections. As was indicated in the previous section of this document, the projections are determined annually in consultation with the campuses and are then adopted by the President for official University use during the current year. In Step I, the most recent ten-year projections, broken down by campus and by undergraduate and graduate levels, are distributed to the campuses. The campuses then develop a first approximation to the distribution of their enrollment totals by school, division or college, and by department or other teaching unit. They undertake to explain these tentative distributions as they relate to academic goals and objectives, and the resulting

materials are submitted to the APPR Board.

The process by which each campus prepares these and subsequent campus submissions is not rigidly prescribed by the APPR Board, but each campus obviously must engage in its own iterative process with its departments or other appropriate operational units. Individual unit plans must be reviewed and differences resolved at the campuswide level, so that campus submissions are integrated proposals rather than a composite of the unevaluated plans of each unit. Planning at the campus level must involve appropriate consultation with the proper Academic Senate committees and with students, through their representatives.

In similar fashion, the APPR Board then reviews the campus submissions for their Universitywide impact, evaluating them and identifying problem areas that need further consideration.

Step II - At this stage in the iterative procedure, the APPR Board issues further guidelines to the campuses which set forth broad funding levels as well as statements of the need in some areas for adjusting campus goals to meet Universitywide goals such as avoiding unused capacity and meeting overall student demand and social needs. By providing broad funding level guidelines, the University attempts to give the campuses the maximum flexibility in proposing trade-offs in the use of resources among all components of their programs.

The campuses now refine their statements of goals and objectives as related to the enrollments, which were set in Step I, and attempt to determine how resources can best be distributed to maximize academic programs of high quality. New campus submissions based on these considerations are returned to the APPR Board.

This is the stage which the current iterative planning process has reached. Campus submissions were used in the development of the brief "Campus Profiles" presented in a later section of this document.

Step III - The final step in the planning cycle will be completed when the APPR Board reviews the campus plans, evaluates their contributions toward meeting Universitywide planning objectives, obtains additional information as needed, resolves differences where the plans of two or more campuses conflict, and negotiates with the campuses such adjustments of programs as may be necessary to fill any gaps or reduce unwarranted overlap in Universitywide offerings. Campus Academic Plans will then be recommended by the APPR Board to the President for his action. Campus Plans as well as the University Plan require final approval by The Regents.

Campus Academic Plans must be detailed enough that their aggregates give an accurate picture of the present and future capabilities of the University to perform its missions. They must be realistic, and translatable into budgetary terms so that resources can be provided for their implementation. They must be flexible enough to provide for temporary aberrations to meet unforeseen emergencies or to take advantage of unique opportunities. Campus budget requests will be derived from the approved Campus Plans.

In subsequent revisions of Universitywide and Campus Academic Plans, this iterative process will be continued.

The Program Review Process

A key element of the planning process is program review at the campus and Universitywide levels. At both levels, review bodies will have to make rigorous evaluations of existing programs and proposals for new programs from the standpoints of quality, scholarly importance, student need, and other criteria to be discussed later in this section.

Although the criteria for program review will be similar in most instances, the perspectives for program review will be somewhat different on the different campuses and at the Universitywide level. On the mature campuses, local campus review bodies must be particularly aware that new directions in scholarly activity will have to be achieved primarily through revisions in existing programs and the phasing out of less essential programs in order to make way for new programs assigned higher priorities. On the growing campuses, resource limitations associated with slower growth will require local program review bodies to evaluate proposed new programs with great care to determine which of them will contribute most importantly to overall academic development, and to review existing programs to determine whether their present patterns are consonant with the new slow-growth conditions. (Brief accounts of program review activities on each campus are included in the "Campus Profiles" section of this document.)

At the Universitywide level, program review groups will need to be sensitive to campus perspectives but must view their final decisions from the perspective of the total spectrum of University of California offerings. Once considerations such as quality, scholarly importance, and student demand are satisfied, the major additional concern is whether the individual programs under review enrich the total University spectrum or whether they lead either to unwarranted overlaps or serious gaps in the array of offerings. The program review process at the Universitywide level includes the authority to disapprove programs which result in unnecessary duplication and to re-order campus priorities to assure that all programs judged to be of scholarly and professional importance are presented somewhere within the institution.

Some program review decisions require action beyond the level of the Office of the President. A proposal for any degree (undergraduate or graduate) which is new for a particular campus requires final action by The Regents. In addition, there is provision in the State's Master Plan for Higher Education and in legislation for the Coordinating Council on Higher Education and its successor, the Commission on Postsecondary Education, to conduct such reviews of proposed new programs as may be necessary to assure the orderly development of higher education in California. The University will work closely with the new Commission in developing mutually satisfactory guidelines and procedures for program review.

Review of New Graduate Programs - During the period of rapid University growth in the 1960s, it was assumed that every general campus would move fairly consistently towards the eventual offering of a full spectrum of graduate programs, and the approval of new graduate programs in the University depended almost exclusively upon

favorable academic review. The new conditions of slower growth and the associated limitation of resources made apparent the need for closer administrative scrutiny to assure that resources for new programs would be allocated on the basis of both approved campus and Universitywide priorities. In June of 1972 the President issued a new statement, "Policy and Procedures for the Review of New Graduate Programs and Degrees." The statement calls for "full administrative as well as academic review of proposals at the campus level" and provides:

> Particular attention should be given in the campus review process to the compatibility of potential new programs with campus academic plans and to the resource implications of such programs...The proposal also must have the written endorsement of the Chancellor of the campus concerned. The Chancellor's recommendation must be accompanied by appropriate background material together with estimates of additional costs for staff, space, equipment, and special library needs to sustain the program... If a particular program involves the active participation of more than one campus, it must have the approval of each campus.

Proposals endorsed by the campus Graduate Council and the Chancellor then go to the Coordinating Committee for Graduate Affairs and, finally, to the Office of the President for authorization, or for further referral. The APPR Board Steering Committee conducts the administrative review, and the Vice President - Academic Affairs has final responsibility for acting on such proposals for the President.

Along with the June 1972 policy statement requiring administrative as well as academic review, the President issued "Interim Policy Guidelines for Initiating New Graduate Programs in the University." These guidelines provide, first, that

> ...all new programs, ...will be reviewed as to their educational merit, the quality of faculty and facilities, and their promise of high academic value. These reviews, conducted by campus faculty and administrative agencies, and by the Coordinating Committee for Graduate Affairs, must result in positive assessments if there is to be any further consideration of the proposals.

Beyond this basic academic review, administrative review of new graduate program proposals is pursued in the light of the following criteria:

* Consistency with the relevant Campus Academic Plan and a high campus priority.
* Positive contribution to the total academic effort of the campus; foundation on campus strengths.
* Documented student demand.
* Lack of comparable offerings or capacity on another campus.
* Market for graduates.

* Documented level of resources at inception and during the initial five years.

* Proof that the program will not adversely affect relevant undergraduate programs.

* Course offerings appropriate to the projected number of graduate students.

* Continuing strict control of the number of graduate students.

If additional Universitywide resources are requested, the campus must demonstrate that it has made a campus-wide review to determine that the additional resources are not available on the campus. If some campus resources are to be reallocated to support the new program, the campus must demonstrate in detail the source and nature of these resources and must show that essential undergraduate programs will not be adversely affected by such re-allocations. Both of these alternatives require that the campus must make a systematic effort to curtail or eliminate low priority programs so that, as far as possible, resources comparable to those needed by new programs of high priority are released.

Review of Selected University Programs - Among the responsibilities assigned to the APPR Board is the "review of University offerings in the various disciplines and professional fields." The Board may select for review any subject area whose development appears to have significant implications for the achievement of the University's planning objectives. Disciplinary areas marked for early attention are those in which proposals have been made for introduction or expansion of work on a number of campuses, or in which substantial changes in student demand or social need suggest the desirability of re-evaluation of total offerings and associated activities. The Board is just beginning this part of its assignment, and during the current year is conducting Universitywide reviews of offerings in Administration and Management, Marine Sciences, Education, and selected areas of Engineering. The principal focus in such reviews will be at the graduate or professional level, although consideration of related undergraduate programs will also be involved.

The criteria used in cross-campus reviews will be similar to those used in the review of new program proposals, but they will, of course, be applied simultaneously to all the individual programs in a specific disciplinary area across the campuses. Because the process of such intensive Universitywide review is relatively new, the selection of appropriate criteria, their relative weight, and the best measures to be employed are matters which will undoubtedly change as experience is gained. At present, the criteria to be used in Universitywide reviews are the following:

* Program quality.

* Intellectual rationale.

* Student demand.

* Productivity of the program.

* Resource utilization.

* Market and placement potential for graduates.

* Relationship to approved undergraduate programs and structure.

* Importance to the public interest.

* Importance to the University.

* Importance to the campus.

To conduct the review in each disciplinary area, the APPR Board appoints an Academic Program Review Committee composed of faculty representatives from several campuses and one or two persons from outside the University -- faculty members from other institutions or leaders in associated professions. The APPR Board may specify particular questions on which the Committee should focus its review. The Review Committee's report will be submitted to the APPR Board for its consideration. Before the Board reaches its conclusions, it will consult appropriately with Chancellors, committees of the Academic Senate, and official student groups.

Review of Undergraduate Programs - Universitywide reviews of proposals for new graduate programs will involve examination of related undergraduate offerings on the relevant campus, since the possible impact of the graduate programs on undergraduate activities is one of the essential review criteria. Similarly, Universitywide review of selected disciplines across the campuses will involve some undergraduate courses in those disciplines, although most of the courses scrutinized will be at the graduate or professional levels. Campus review processes, of course, will cover undergraduate offerings.

At present, responsibility for initiation of new undergraduate, non-professional programs rests with the campuses. In the future, however, it may well be necessary to undertake Universitywide review of proposals for some kinds of new undergraduate programs, especially those lying outside the generally accepted core of undergraduate offerings or those involving high costs and somewhat limited student demand. Precisely which kinds of new undergraduate programs would necessitate Universitywide review has not yet been determined, nor has an appropriate avenue of Academic Senate involvement for undergraduate matters comparable to that of the Coordinating Committee for Graduate Affairs at the Universitywide graduate level been established by the Senate.

Review of Organized Research Units - University policy provides for review of the programs of organized research units and the effectiveness of their Directors or Chairmen at intervals of five years or less. Special review committees chosen from slates nominated by the Academic Senate are appointed by Chancellors, or by the President in the case of Universitywide units.

The September 1971 statement of Administrative Policies and Procedures Concerning Organized Research Units provides that a unit should be reviewed

> ...with regard to its original purpose, present functioning, future plans, and continuing development to meet the needs of the field. The review shall look to the unit's success in meeting previously established objectives, planned changes in program objective, and planned steps to achieve new objectives...

When an organized research unit is to be discontinued, the policy provides for a phase-out period of up to a year to permit termination or transfer of contractual obligations and staff time to find alternate employment.

SOME SPECIAL CONCERNS FOR THE 1970s

This section discusses some of the particular problems and policies of the University, in a number of different areas, that will need attention in the decade of the 1970s. No attempt is made here to be exhaustive either about all areas of the University or about all aspects of the general areas that are listed for discussion. The Campus Academic Plans will have more to say regarding many of these topics, and other topics are dealt with at length in special reports available elsewhere in the University. As circumstances change over time and new problems arise, future editions of the University Academic Plan will very probably deal with important areas of the University not touched upon in this document.

The University's Public Service Activities

It has been customary to describe the functions of the modern American university under three headings: teaching, research, and public service. This practice, while a convenience for some purposes, has had the unfortunate result of implying, quite erroneously, that teaching and research are not forms of public service. A more accurate description, and one that was used in the section of this document on "Basic Assumptions," is to refer to a university's responsibilities for undergraduate education, graduate and professional education, research, and other kinds of public service.

At the University of California, the growing interrelationship among the various activities normally grouped under teaching, research, and other forms of public service has made it illogical to identify and describe separately a "public service" area of the University.

In the following discussion of topics of special University concern in the 1970s, the contributions to public service of each area will be implicit in most instances. The discussion of University Extension, the remarks devoted to Cooperative Extension under the general topic of Agricultural Sciences, and the description of efforts to make research findings more broadly accessible under the general topic of Research, are more explicitly pointed toward public service beyond the bounds of teaching and research as traditionally defined. The discussion of the Extended University indicates that this is a new University instructional activity, although it has often been inaccurately described as though it were a separate public service activity.

For purely administrative purposes, several of the University activities that do fall outside the traditionally-defined areas of teaching and research were assigned in 1971 to a newly reorganized Office of the Vice President -- Extended Academic and Public Service Programs.

Broader Clientele

During the 1960s the University was concerned chiefly with expanding facilities and services to meet the rapid growth in the numbers of what might be called its customary clientele. With the decline in these pressures for sheer growth, the University now has the opportunity to turn its attention to the service of a broader clientele. As a public trust, the University has an obligation to serve as many Californians as possible, the limiting principle being that the service provided must be of a kind fully appropriate to a university.

* In the undergraduate area, the University recognizes that many potentially qualified students are ineligible for regular admission as a result of cultural or educational disadvantages. To compensate for this, University regulations now permit the admission by special action of 4 percent of its students. These specially admitted students have generally succeeded in meeting regular standards of student performance. Admissions requirements will continue to be scrutinized and revised as necessary to assure that they are the best possible predictors of academic success.

* In the graduate and professional areas, special efforts are being made to increase the numbers of women and of minorities admitted to the various programs.

* At all student levels, the University is providing as much financial aid as its resources permit in an effort to decrease the financial barriers that discourage the enrollment of students from low-income families.

* In the past, the University's degree programs have been designed primarily for fulltime, on-campus students. The University has now launched the pilot phases of a new program, the Extended University, which will permit an additional student clientele to earn a University degree through part-time academic work, both on- and off-campus.

* University Extension will continue to expand its offerings to the increasing number of persons who seek continuing education to update their professional capabilities or who for other reasons wish to pursue lifelong learning opportunities.

* Cooperative Extension will continue to broaden its clientele as it shifts its orientation somewhat from rural agricultural concerns to issues involving the environment, natural resources, and family and consumer problems.

The Faculty

The contributions of the faculty to instruction in the University are made not only through formal classroom teaching, but through advising and informal contact with students, supervision of various kinds of independent study by undergraduates, guidance of graduate student research and supervision of doctoral dissertations, development of new courses and new approaches to instruction, and assistance to graduating students who wish to enter graduate or professional school and to students who are seeking employment. These are time-consuming responsibilities, for most of which the faculty is not given formal credit. Under delegation from The Regents, moreover, the faculty exercises authority over courses and curricula and over requirements for admission and degrees, thus providing the tone for the intellectual environment of the University. Greater efforts need to be made to inform those outside of the University of the full spectrum of faculty responsibilities.

Faculty Quality and Faculty Renewal - The great distinction of the University of California faculty has been achieved by a tradition of vigorous academic leadership in setting and adhering to high standards in recruitment and by the joint efforts of the administration and the faculty, supported by The Regents, in the operation of a carefully conceived and rigorous appointment and promotion policy. During the period of heavy and competitive recruitment in the 1950s and 1960s, these staffing policies served the University well in the development of a faculty whose quality remained high as its numbers increased to match the rapid growth in enrollments.

Now that enrollment growth is slower, the University's academic personnel plans and policies have an especially crucial role to play. The challenge to academic personnel planning during the rest of the 1970s will be to learn how to adapt to shifts in academic emphasis, to the emergence of new fields and combinations of fields, and to meet new needs and accommodate new demands from students and society in a slow-growth or no-growth situation. Such planning is particularly essential because of the fact that some campuses are at or near their planned enrollment ceilings. It is of vital importance to the University and each of its campuses to have assurance that new faculty appointments can continue to be made at a rate that will keep opportunity open for the best and most promising young aspirants to academic careers, including women and minority candidates, and that will bring into the faculty men and women with new expertise and with fresh insights and ideas. It is also important to make the most of the opportunities afforded by sabbatical and other leaves, both in benefiting the faculty who take such leaves, and in utilizing released funds to bring visiting faculty who can contribute in definite ways to a vigorous and stimulating intellectual environment.

Each campus is looking ahead in faculty personnel planning and is examining the prospects and the policy alternatives with respect to such things as turnover (number of faculty positions vacated annually), age distribution, expected number of new hires year-by-year, tenure-nontenure mix, and optimum strategies in the use of available positions (whether for temporary appointments or, among appointments on the academic ladder, for tenure or nontenure appointees).

There are a number of general purposes to be served in such planning: (1) To assure flexibility in staffing resources to meet new program needs, unexpected shifts in program requirements, and unpredictable changes in enrollment; (2) to assure a continuing influx of new talent; and (3) to be able to make progress with affirmative action goals in bringing qualified women and members of minority groups into the faculty.

The planning problems are not the same on all campuses, of course. They vary according to several factors, among them the campus prospects for growth in enrollment and hence of faculty, the current faculty age distribution and tenure-nontenure mix, and the turnover rate.

The annual turnover rate for ladder-rank faculty (those in the regular professor title series) was about 4.6 percent for the University as a whole in 1971-72. In that year 143 assistant professors left the University and the services of 151 associate professors and professors were terminated by death, retirement, or resignation. Berkeley and Los Angeles have developed faculty personnel plans for some years ahead on the basis of an assumed turnover rate of 5 percent in the ladder-rank faculty. (This accords with their recent experience). They plan to maintain about 10 percent of the budgeted faculty positions for temporary appointments to non-ladder-rank positions. This provides flexibility for the shifting of faculty resources from one program to another on the campus as program needs change. Berkeley and Los Angeles also plan on making most of each year's new appointments at junior levels; however, the plans allow for making a certain number of new appointments at the more senior levels. The ability to make some appointments at senior levels is important, for providing leadership in new programs and for selective strengthening of existing programs. On the basis of experience with the proportion of the cadre of assistant professors that is promoted to tenure each year, and with an assumed policy of requiring approximately 80 percent of all new ladder-rank appointments to be made at nontenure rank, Berkeley and Los Angeles foresee an assured possibility of maintaining a 5 percent rate of turnover. They will thus be able to make a satisfactory number of new appointments each year. At this rate, one quarter of the faculty will be replaced every five years.

Similar studies of turnover rates and strategies for faculty personnel planning are underway on the other campuses.

Each campus is examining the age profile of its faculty. In June 1972 the average age of the University ladder-rank faculty was 43.6 years. The figure for Berkeley is highest (45.0) and that for Santa Cruz is lowest (39.7). It has been estimated recently that 62.6 percent of the present Santa Cruz faculty will not reach compulsory retirement age (67) until after the year 2000. Personnel planning should have as one objective the attainment of a rather even age distribution of the faculty on each campus, so that vacancies occurring as a result of deaths and retirements will come in a rather regular fashion. To achieve this objective, campuses with predominantly young faculties will find it wise to make a considerable number of senior appointments over the next five or more years.

To assure systemwide flexibility of resources in faculty positions, the President is making a portion of the allocations of positions to campuses on a non-permanent basis, subject to recall and reallocation as appointments in these positions expire.

There are other elements of faculty personnel planning: use of early retirement, facilitation of intercampus transfer of faculty, and encouragement of sabbatical and other leaves for personal renewal of faculty members -- in order to update their knowledge, to broaden their areas of special knowledge, to develop new skills in teaching and research. Also, when positions are temporarily vacated through leaves of absence, they should be used, insofar as is practicable, in imaginative ways to further special thematic programs which vary from year to year and bring added dimensions of quality and variety to departmental programs, benefiting students and faculty alike.

The Regents have approved a limited and voluntary program of early retirement at the invitation of the administration, for faculty members in their early sixties. The plan provides for part-time duties until attainment of the mandatory retirement age and full benefits thereafter. Other kinds of early retirement plans may be developed as more experience is gained in this area. Funds freed by such plans can be used for new junior appointments, thus playing an important part in faculty renewal.

Plans for faculty renewal will be an important part of each Campus Academic Plan.

Faculty Service on More Than One Campus - Voluntary intercampus transfer of faculty, either permanent or temporary, is one means by which to achieve greater flexibility in academic personnel planning. Another possibility rests in intercampus use of faculty without involving transfer. A department that needs but lacks a faculty member with a particular kind of specialty but has insufficient resources to make an appointment in this area could arrange for the services of such a specialist from another campus on a part-time basis. Or, if the number of students to be served were small, and the distance between the campuses were not too great, the students might seek out the specialist on his or her home campus for course work or research consultation. This approach can be formalized through greater use of intercampus and joint degree programs which could assure each faculty member on every campus the opportunity to participate in graduate instruction somewhere within the system. It was once quite commonly -- and successfully -- used within the University. The time has come to re-emphasize it.

Undergraduate Education

Undergraduate education is one of the University of California's prime responsibilities. The Growth Plan adopted by The Regents in July of 1972 states:

> Undergraduate education will continue to be a vital concern of the University. A large measure of the talents and resources of the University will be devoted to its undergraduate programs, in order both to maintain existing strengths and to effect needed improvements and innovations.

The Growth Plan goes on to summarize the importance of undergraduate education in a University context:

1. The University serves as a model or laboratory in which new modes of undergraduate education may be developed and tested.

2. Because of its dual responsibilities for undergraduate and graduate instruction, the University offers opportunities for direct undergraduate experience with research and scholarship not otherwise available.

3. The presence of good undergraduate programs is essential for successful operation of balanced graduate programs, so that graduate students may participate in supervised apprentice teaching.

4. Undergraduate and graduate education on the same campus interact in a number of other important ways. Joint work, consultation, and informal contacts among students of different levels enrich the experience and education of each group. Many high-cost campus resources -- libraries, computers, and large items of equipment -- can be more efficiently used on a campus which provides for the education of a full range of students.

5. Because of the need to provide opportunities for graduate students to attain greater breadth of preparation and to fill in some prerequisites, even a campus which served only graduate and professional students would find it necessary to teach certain courses at an upper division, undergraduate level. The use of such courses by undergraduates represents a real efficiency in the use of teaching time and facilities.

Undergraduate Programs on All General Campuses - All general campuses of the University now offer, or will offer as soon as they can be fully funded and developed, high quality undergraduate programs in a wide range of the instructional areas commonly recognized as important to a modern university. In addition to the compelling reasons for this policy already recognized in the Growth Plan and cited above, two other reasons particularly important to students should be noted: undergraduates are not as highly mobile as graduate students and a geographic spread of opportunities should be maintained for a broadly representative undergraduate curriculum; in addition, undergraduates are often uncertain of their academic goals when they enter the University, and they should have opportunities for exposure to most of the generally recognized core disciplinary areas so that they can choose their goals soundly.

Beyond the provision of a core curriculum, however, the several campuses are encouraged to cultivate some distinctive undergraduate program emphases and a variety of modes of instruction and academic organization. Those undergraduates who are sufficiently mobile should enjoy a wide diversity of choices for their undergraduate University experience, and those with strong motivations to pursue a particular specialization should be able to select a campus with some curricular emphasis in that area.

Improvement of Undergraduate Instruction - Like several other research universities of high distinction, the University of California is renowned for the quality of its graduate instruction. It is sometimes alleged that undergraduate instruction at these distinguished research institutions is, by contrast, of lesser quality. The allegation tends to be contradicted by such evidence as the number of Merit Scholarship winners and other highly qualified -- and extremely knowledgeable and select -- students who choose these institutions, including the University of California, for their undergraduate training. A survey by the Carnegie Commission on Higher Education, moreover, found the highest rate of satisfaction with undergraduate experience among students at the distinguished research universities -- even higher rates than at the outstanding private liberal arts colleges generally reputed to concentrate on high-quality teaching.

Nevertheless, the University of California has been making special attempts, particularly since 1970, to improve further the quality of its undergraduate instruction. On all campuses, efforts have been made to provide entering students with opportunities to take small classes or seminars taught by senior faculty members. Full implementation of these efforts, unfortunately, has been limited by the lack of adequate financial resources. Senior faculty throughout the University are directly involved in undergraduate instruction at all levels. The numbers and kinds of courses required in undergraduate curricula are being reviewed, and those courses whose presence in a curriculum appears to be founded on custom rather than current academic need are being eliminated to make room for requirements with greater academic value or for additional electives.

Four important projects with special funding have been initiated in recent years to aid in the improvement of instruction:

1. Innovative Projects in University Instruction - Funded by The Regents in 1967 from the University's Opportunity Fund, this program presently allocates $400,000 annually for development of innovative teaching methods such as auto-tutorial techniques.

2. The Regents' Undergraduate Instruction Improvement Grants - This program was established in 1971 and is funded at $300,000 annually, the funds being allocated among the campuses in proportion to their undergraduate enrollments. The emphasis is on such teaching improvements as selecting a large undergraduate class that would particularly benefit from being divided into smaller sections or seminars.

3. The special provision in the Governor's Budget for the University of $1 million for 1973-74 "to increase interest in and give special recognition to excellence of undergraduate instruction in the University" - The Regents have determined that half of these funds should be used for evaluation of teaching and courses, and the remainder for development of seminars or other types of special courses for entering undergraduates or for the improvement of other courses and curricula. The Governor's Budget for 1974-75 provides another $1 million. The special focus for the

use of this fund (if it is finally approved in the operating budget for 1974-75) will be determined later in the 1973-74 academic year.

4. The Regents' funding in late 1973 of $300,000 for a program of excellence in instruction - This fund provides a pool of resources for individual faculty members, administrators, and students who are attempting to develop teaching improvements and innovative learning environments.

The focus of all of these projects tends to be on undergraduate instruction, with graduate instructional activities explicitly excluded from two of the funds.

The University is now establishing an advisory committee to coordinate and evaluate these programs and to suggest worthwhile activities not covered by the first three programs which might receive special attention under the fourth.

Evaluation of Teaching - Students will continue to take an active part in the evaluation of the faculty members who teach their courses.

In the 1970 revision of Instructions to Review and Appraisal Committees for faculty appointments and promotions, the President provided that:

> It is the responsibility of the Department Chairman to submit meaningful statements, accompanied by evidence, including evaluations of the candidate solicited from students, concerning the candidate's teaching effectiveness at lower-division, upper-division, and graduate levels of instruction. If such information is not included in the letter of recommendation, it is the review committee chairman's responsibility to request it, through the Chancellor.

Students will continue to help design evaluation instruments, suggest improvements in advising procedures, and participate in various other ways in the University's efforts to improve the quality of instruction.

Campus and Community as a Learning Environment - The University will continue to exercise its responsibility to help provide appropriate social, cultural, and physical settings for learning. Because student bodies are composed of increasingly diverse constituencies, the University must be sensitive and responsive to the diverse non-classroom environmental needs of its students.

Student affairs programs and campus cultural offerings will continue to be supported as important learning opportunities. Students learn much through informal contact with each other and with faculty members, and the University will continue to seek the necessary capital outlay support for more physical facilities in classroom buildings and elsewhere on campus which encourage informal interaction among students and faculty. The University also recognizes its appropriate concern for the housing, recreational, and commercial needs of students in the communities surrounding the campuses, and its role in promoting good relations between the campus community and its non-University neighbors.

Graduate and Professional Education

The University of California has unique responsibilities under California's Master Plan for the provision of doctoral instruction (doctoral degrees may be issued jointly with the State University and Colleges) and of professional training in the fields of dentistry, law, medicine, and veterinary medicine. The University shares with the State University and Colleges the responsibility for instruction for the master's degree and other professional training. The Growth Plan adopted in 1972 says of these responsibilities:

> The University's unique role in doctoral education requires that substantial effort and resources be devoted to the preparation of doctoral students, but this activity must be balanced with the University's other responsibilities.
>
> The activities of the University in education for the professions should be expanded to fulfill more completely the needs of California residents for training in the professions and the needs of the State for the services of trained professionals.

The degree of Doctor of Philosophy will continue to be of central importance because those who receive it become the specialists who teach at upper educational levels, provide expert assistance to the people of the State and the nation, and are responsible for the generation of a large share of new knowledge.

Distribution of Graduate and Professional Programs on the Campuses - The University's 1966 and 1969 Academic Plans envisioned that each of the general campuses would make fairly steady progress toward provision of a broad array of graduate and professional programs in order to meet expected student demand and social needs. The changing outlook for enrollment demand, financial support and needs for doctoral degree holders was reflected in the University's 1972 Growth Plan. The Plan states:

> Graduate and professional instruction should be a significant element of the mission of all University campuses, and each campus should be given an opportunity to develop certain areas of distinction at this level.

The Plan goes on to stress that

> ...full-scale graduate and professional programs cannot be developed on all campuses during the period covered by this Growth Plan [to 1981-82]. During this period, emphasis on graduate and professional education, especially on the newer campuses, must be on complementary campus specialization and on "modular" development of selected strong programs as opposed to an even, but thin, spread of support over a larger number of programs.

Table 1 in the "Enrollment Projections" section indicates that graduate enrollments will grow, although very slowly, at each of the University's general campuses during the ten-year projection period. Existing programs will generally be developed further and new programs will be built on existing areas of unusual strength. New programs will be undertaken only if there is clear evidence that they will be of high academic quality from their inception. Universitywide planning will take into account the complementary distribution of graduate programs across the campuses to assure provision of a full range of scholarly and professional curricula throughout the University without unnecessary duplication of effort.

Improvement of Graduate Instruction - Graduate instruction at the University of California has a general reputation for outstanding quality. Training for the doctoral degree, here and at other distinguished research universities, has recently come under criticism on several grounds, the charges being that there is unduly narrow specialization, that there are unrealistic demands made on the doctoral candidate in terms of the scope expected and the time that must be invested in the thesis, and that there is not enough emphasis on appropriate training and experience in teaching. An alternative degree, that of Doctor of Arts, has been suggested by the Carnegie Commission on Higher Education and others, with provisions for broader subject matter instruction, less specialization, more teacher training, and a descriptive and analytical thesis rather than a research thesis.

The University is not convinced of the case for the Doctor of Arts proposal, but will continue to examine it. Many in the University think that the proposed new degree would not be sought after and that it would probably be viewed as a second-class Ph.D. However, the University will give careful attention to the best method of dealing with the underlying criticisms of the Ph.D. It is recognized that Ph.D. programs should be made more flexible, to give recipients of the degree more options in career choices and to fit them better for teaching if that is the career chosen. Accordingly, a joint Senate-administration-student committee was established in 1973 to study the University's doctoral programs, and is to submit a report by June of this year. The study will be carried on in conjunction with reviews of doctoral education on the campuses and in consultation with the Academic Senate. Issues under particular consideration are (1) admissions criteria and practices, (2) counseling and supervision, (3) the nature of requirements for the doctorate, especially as they affect the flexibility of the program, opportunity for teaching experience, and time needed to attain the degree, (4) attrition and average time to the doctorate, and (5) fee structures for students seeking the Ph.D.

Nonresident Graduate Students - At the graduate level, the University of California is a national and international university, attracting students from all parts of the country and the world, while acknowledging its special obligations to California residents. The presence of graduate students of high ability, wherever they may come from, is an important factor in maintaining the quality of teaching and research and in attracting the best faculty members. Many students change from one institution to another when they undertake graduate work. Many of California's most able students will go elsewhere for graduate or professional study, while many able students from other states come to this University. A high proportion of these incoming students remain in California as permanent residents after completing their graduate training. They contribute importantly to business, industry, the professions, government, and cultural life in the State.

Fees for nonresident graduate students have become high in recent years, and at the same time the number of fee waivers for outstanding graduate students has been substantially reduced by legislative action on the University budget. The University continues to stress the importance of adequate numbers of fee waivers to attract the ablest graduate students and, to the extent resources permit, will provide for some additional fee waivers from available non-State funds.

Student Participation in University Governance - Both undergraduate and graduate students should have an opportunity to participate in University governance. The administration has arranged for student representation on many administrative committees at both campus and Universitywide levels. Students are, for example, members of the doctoral program study committee just described, as well as of the APPR Board, and thus have an important voice in Universitywide academic planning and program review. The Chancellors have recently been asked to suggest ways by which the views of graduate students can best be brought to bear in campus reviews of graduate programs.

The Extended University

The University of California historically has offered academic programs to degree seeking undergraduate students who could attend on a full-time, on-campus basis. The University is now also committed to offer academic programs of the same high quality to qualified upper division and graduate students for whom the full-time, resident programs have been generally unavailable because of work schedules, home responsibilities or geographic distance from a campus.

The Extended University, an educational concept whose pilot phase extends through June, 1975, has been initiated to test and experiment with the myriad of educational problems associated with unconventional forms of higher education. On the basis of the experience gained during the pilot phase of the Extended University, changes will be effected in University educational and administrative policies which will give the program a permanent place within the University.

During the pilot phase, academic programs are being offered on a part-time basis by the University's regular faculty and academic departments primarily to adult students. At present, more than 1,000 students are enrolled in a total of 19 degree programs. The pilot programs, which are subject to the same administrative and Academic Senate review and approval procedures as are regular academic programs, have the following objectives:

- -to offer programs to adult, part-time students at times and places convenient to them;
- -to design new curricula specifically for adult, part-time students, when appropriate;
- -to experiment with new and novel approaches, both technological and non-technological, to teaching;
- -to offer programs primarily off-campus and attempt to discover and deal with problems associated with such off-campus instruction;
- -to undertake to experiment with alternative approaches to pertinent Academic Senate regulations, especially those concerned with residency and admissions; and,
- -to develop the ability to provide these programs on a more cost effective basis.

In addition to these objectives, it is expected that the close association between the University's full-time programs and the Extended University's part-time pilot programs will assure appropriate academic rigor and standards in the new programs. Significant changes are expected to be effected over a period of time by way of constructive influences the new programs will have on the old.

In addition to the campus-based programs, the Extended University will design and develop degree programs for part-time students, (a) when such programs promise greater cost effectiveness when offered by one or more campuses; (b) when part-time students are unable, because of distance or similar geographic constraints to enroll in a campus-based program; and, (c) when programs are not otherwise offered by the campus. Faculties responsible for offering these non-campus based programs, which will be developed on a regional or statewide basis, will be drawn from one or more of the University's campuses.

University Extension

Over more than three-quarters of a century, University Extension has grown to be one of the major educational organizations in the State. Its particular mission is to provide to the adult public of California the opportunity to benefit from the research and other resources of the University of California. Annual enrollments have now reached 350,000 students, who participate in more than 10,000 classes, short courses, seminars and field studies.

The demand for lifelong learning continues to grow, for constant updating of professional skills, for dissemination of information important to the solution of social problems, and for individual growth and enrichment in a period of increasing leisure. The role of University Extension throughout the State will thus continue to expand over the decade of the 1970s.

Instructional areas considered by University Extension to be of particular importance in the immediate future are:

* Continuing education in the professions - University Extension has already developed an extensive program of continuing and recurrent education for professionals in a number of fields, in cooperation with professional schools, associations, and individual members of the professions. This program will increase even more markedly during the coming decade because of the rapid discovery of new knowledge and the trend for State regulatory commissions to require periodic relicensure. Instructional programs for professionals and paraprofessionals are now being offered in the health sciences, law, engineering and technology, ecological and environmental sciences, the behavioral sciences, and other professional areas. As academic subject areas increasingly overlap, University Extension is attempting to develop more certificate programs based on interdisciplinary education in professional areas.

* Teaching programs directed toward social problems - Drawing on University research and other resources, University Extension is increasingly active in providing special courses which focus on such issues as unemployment, race and poverty, land use, drug abuse, environmental concerns, and problems of youth in minority and low-income communities. Many of these programs are planned and presented in cooperation with city and county planners, other public agencies, and volunteer organizations. Special emphasis is currently being given to public service programs for segments of society that tend to be "left out" -- courses to help these segments upgrade their knowledge and skills in career areas and to be fully aware of their rights.

* Instruction for an informed citizenry - The complexities of modern society require a sophisticated electorate, and University Extension offers courses on a broad array of local, state, national and international issues for individuals who want to learn more about matters on which they may have to help reach decisions.

* Courses in the liberal and creative arts - In a State which already has a high average educational level, University Extension programs in the liberal and creative arts focus upon the use of innovative media to help advance appreciation of and creative contributions to these fields.

* Programs directed toward self-awareness and identity - In response to widespread demand, University Extension is providing more courses and seminars which deal with various aspects of interpersonal relations, coping with alienation, and finding identity and meaning in the context of the strenous demands of modern life.

Research

Research is an integral function of all important modern universities, and a key component of the University of California's activities throughout its institutional history. In 1960, the year the Master Plan for Higher Education in California officially designated the University as the "primary state-supported agency for research," the annual All-University Faculty Conference took as its theme "The Research Function of the University." The Proceedings of that Conference set forth the following four reasons for research in a university:

1. The university as a community of creative scholars has an obligation to contribute to the growth of knowledge in general.

2. There is a more specific obligation to help solve problems of the community, state, or nation when unique talents of its faculty or special facilities are needed for such problems.

3. A faculty member continuously active in research will be more likely to remain an effective and stimulating teacher than one who is not contributing to the growth of a field.

4. A distinguished faculty, of the type necessary for the stimulation of creative thinking, can be attracted only by an environment that encourages effective research.

The Relative Place of Research in the University - A faculty member working in a department devotes his efforts to both teaching and research; most research done in the University is so intimately connected with teaching and learning that it is impossible to draw a clear distinction between what is research and what is teaching and learning. When teaching and learning are carried on by inquiring minds and with the intent of investigating what is unknown or not well understood, then research is either explicit or latent in the situation.

Graduate students are an integral part of this stimulating process, through participation in classes and seminars or while working with faculty members and other advanced students in a common research environment at the laboratory bench or in the field. Undergraduate students benefit most directly through learning of new discoveries or interpretations of knowledge, often before such information is published and generally available. Increasingly, undergraduate students, through independent or directed study opportunities with individual faculty members, are able to share in the excitement of discovering new knowledge in a manner similar to that historically enjoyed primarily by graduate students. Therefore, the research-teaching environment contributes significantly to the educational experience of students at all levels. This is not possible in an institution lacking the strong research dimension.

Orientation of Research - A perennial question concerns the extent to which the University engages in basic as against applied research. The University does perform both kinds of research -- sometimes in one and the same project. The 1969 Academic Plan stated:

> The distinction [between basic and applied or mission-oriented research] is not precise, and it may be inaccurate to classify a given piece of research work as being entirely one or the other. As a generalization, that research is basic which has as its purpose to add to knowledge in

> ways which promote deeper and more thorough understanding of underlying principles in a discipline...without regard to the immediate applicability of the knowledge in solving "practical" problems. Applied research, by contradistinction, is that which is undertaken with conscious recognition that the purpose is to help in solving a practical problem.

University research taken as a whole is, and should continue to be, more often at the basic end of the spectrum than is the research performed in government or private industrial laboratories. The relative concentration on basic research is what makes a university's research faculty and facilities unique and especially valuable components of the total research and development effort of the nation. As noted by the 1960 All-University Faculty Conference, however, the University does have a clear obligation to help solve problems of the community, State, or nation when it has faculty expertise or special facilities particularly applicable to such problems.

The University is moving toward more systematic ways of fulfilling this obligation. For example, a descriptive inventory by subject for current contract and grant research projects is being developed; the Office of the Vice President - Extended Academic and Public Service Programs will answer inquiries about the inventory from outside the University. In addition, The Regents' budget for 1974-75 contains an allocation from non-State funds to support efforts to improve access to and dissemination of research results that may have current public utility. The University community has been exerting substantial efforts during the past year to increase and refocus the already considerable research on energy and energy-related subjects being carried on within the University. A Council on Energy and Resources is being formed to aid these efforts.

The topic for the 1974 All-University Faculty Conference, to be held in late March, is "Applied and Public Service Research in the University of California." The Conference is expected to provide additional assistance for the University's efforts to relate its programs of research more effectively to public needs.

Organization of Research in the University - Funds are made available for research through departments (which are officially designated as "Departments of Instruction and Research") or equivalent units, and through Organized Research Units which are generally interdepartmental or interdisciplinary in scope. Such Organized Research Units must be formally established by The Regents on the recommendation of the President. In order to be approved, they must have objectives that complement the academic goals of the departments of instruction and research.

Certain research units, such as the major Atomic Energy Commission Laboratories and the Agricultural Experiment Station, are very extensive in the scale of their operations and employ significant numbers of University professional and support staff. Others, such as the Lick Observatory, do not have large numbers of staff but use complex and expensive equipment. Still others, such as the Earthquake Engineering Research Center, are small in terms of both personnel and resources required. A complete list of the Organized Research Units which have been approved by The Regents is attached to this document as Appendix 2.

As noted in the section on academic planning and program review processes, University policy calls for periodic review of Organized Research Units. Positive approval by the President is required for the continuance of a Unit after such a periodic review.

However organized, whether part of the formal program of a research unit or an individual faculty project, research throughout the University is funded from a variety of sources: State funds, Federal monies, foundation grants and other private sources. While State funds do not represent the greatest proportion of total monies for University research, they provide the "seed" to attract or match funds from other sources and are thus of key importance to the University's total research program.

The Atomic Energy Commission Laboratories - A special committee of the Academic Senate was appointed several years ago to study and make recommendations concerning the relationships of the Atomic Energy Commission laboratories at Berkeley, Livermore, and Los Alamos with the rest of the University. As one of the results of the work of this committee, agreement was reached that each of the laboratories should be required to develop a statement of its academic plan, and that these statements should be published in connection with the Academic Plan of the University. Because of the size of the laboratories, and because they report directly to the President of the University, their statements are included at the end of the section in which the campus profiles are presented.

Libraries

Planning, Policy, and Operations - The library is the heart of a University. Knowledge and thought, the lifeblood of learning, accumulate in the library and circulate from it. Graduate education and research of the highest quality depend critically on what libraries can provide in access to primary sources and records. Recent years have seen a shift in undergraduate education toward the use of primary reference material to supplement texts and lectures. This shift means that a good undergraduate education also depends heavily on the accessibility and quality of library collections.

The University's library planning must take three main elements into account:

The University's own needs

At the core is the University's primary need to have libraries capable of providing support of appropriate scale and quality for the University's missions in teaching, research, and other forms of service.

Master Plan obligations

The University has certain library obligations under the Master Plan to all other segments of California higher education, both public and private.

Regional planning

Regional arrangements for the provision of library service are relevant to the University's own needs, since the campuses are not self-sufficient. But regional arrangements will also involve the other segments and, in addition, will afford a means of providing appropriate services to other users in the communities near the libraries.

The present statement is concerned mainly with the University's own needs. The University's internal library planning must be concerned with all the following points:

* The collection of library materials adequate in quantity, quality, and scope for the support of the University's programs of teaching and research and the proper disposition of these materials within the University so that they can be effectively available to serve the needs of all University users.

* The provision of services to students, faculty, and other University users of the libraries and of services to maintain and develop the collections.

* The recruitment, retention, and development of a professional library staff high in morale and capable of rendering services of top quality.

* The provision of appropriate physical facilities to house the libraries and to provide suitable working space for persons using the libraries as well as for those employed therein and provision of equipment for handling library operations conveniently and efficiently.

Currently, there are difficulties and insufficiencies which seriously affect each of these elements. Only the first two points are discussed here. The others were included in a January, 1974 report to The Regents, which also had attached to it a progress report from the joint UC-CSUC Task Force on library cooperation between the two segments.

Proper collection development and making the University's collections serve the needs of the entire University system are the most complex of the internal library problems . To build and maintain a great library system for this multicampus University is not the same as the building of nine libraries, one for each campus. The University has used a systems approach since the beginning of the 1960s, by maintaining a union catalog for each campus; by providing a bus service for transporting books, other library materials, and library patrons from one campus to another; and by designating the libraries at the Berkeley and Los Angeles campuses as centers of library service for the other nearby campuses. The northern campuses have relied heavily on Berkeley and the southern campuses on Los Angeles, in three ways: by borrowing books from the large libraries, by having certain selections of material in the large libraries photocopied and sent to users on the smaller campuses, and by sending users to the larger libraries.

In the future it will be necessary to develop new patterns of library organization and service and new strategies for getting the maximum utility from funds expended on the library system. The level of acquisition of library materials for the system as a whole must be raised. However, the University will not concentrate all its efforts on an increase in the level of acquisition. In addition to continuing its work on the relation between academic programs and the needs for books and journals to support these programs, the University will investigate new options for the distribution of library resources within the system, for the provision of multicampus service, and for the selection and purcase of books, journals, and other library materials. The service loads now carried by the Berkeley and Los Angeles campuses are too heavy, giving rise to widespread frustration and a large volume of justified complaints. On-campus users at Berkeley and Los Angeles are seriously inconvenienced, and the needs of users from the other campuses often cannot be met at all or within a reasonable length of time.

Each of the campus libraries provides extensive service to non-University users, some of them in other institutions of higher education and some in the general population, industries, and government agencies near the campuses. This service to non-University users places a significant load on the library collections and staff of each campus and affects substantially the service that can be rendered to University users. For example, in 1972-73, of all returnable items sent out by University campuses on interlibrary loans, 67% were lent outside the University system. The number of such transactions outside the system was 23,930, out of a total of 35,557.

Library policy from an all-University viewpoint requires some degree of intercampus sharing of responsibility for deciding on acquisitions of materials and delivery of service. The Office of the President will be a catalyst and coordinator in such a move. The selection process for acquisition of books and journals must be brought to a higher level of "system-consciousness" and "opportunity cost" awareness, for the purpose of getting the greatest good from the funds expended. Also, ways must be found to identify library materials that can serve the needs of several campuses without having to be purchased by and located on each of those campuses.

There must be exploration of all fiscally feasible and practically operable methods for making library materials effectively available to users on several campuses from one particular location. Each campus will, in some subjects, be the holder of unique resources. Thus, the San Diego campus can reasonably be designated as the principal center for library resources in oceanography and the unique holder of some considerable portion of these resources. The University must find ways to decide upon such designations for other fields and other campuses, including the determination of when it is sufficient to have specified materials held by not more than one campus (or, in some cases, by not more than some small number of campuses, e.g., two or three).

It is apparent that the University's system of libraries should not be conceived of as a system of two great libraries, at the Berkeley and Los Angeles campuses, respectively; with a cluster of minor libraries on the other campuses as satellites. The libraries at Berkeley and Los Angeles will certainly continue to be larger and more comprehensive than those on other campuses during the period of planning here envisaged. But each of the campus libraries will have particular strengths and will have its own role as a contributor to the quality of the University's library system.

Consideration will be given to making part of the "regional service" now provided by the Berkeley campus library available in a different way, through an arrangement not under the exclusive jurisdiction of the Berkeley campus administration, and corresponding consideration will be undertaken for the "regional service" now provided in the south by the Los Angeles campus library.

The ability to make library materials effectively available to users is very important. The meaning of "effectively available" must be understood in the context of what is reasonably possible in a situation where resources are limited and must include acceptance of the fact that no campus can be self-sufficient in library resources. Some materials must be available to users by being located on the campus of the user, not merely because this is the most convenient, but because it is also the most economical way of providing a necessary library service. The cost of completing an intercampus loan transaction is such that the cost of only a few loans of an item may well be greater than the cost of acquiring another copy for each of the places where it is wanted for use. Consequently, there are very real limits to the extent to which "effective availability" can be efficiently achieved by borrowing from a remote collection. There are also limits to the extent to which auto-

mation and other technical aids can be employed in a cost-effective manner to eliminate the need for copies of the same book in many different locations.

As the next step in the development of Universitywide library policy the President has appointed a high-level Library Policy Task Force composed of the Vice President - Academic Affairs (as Chairman), the nine campus Academic Vice Chancellors, and the chairpersons of the Universitywide Academic Senate Library Committee and the Library Council. The charge to this group is as follows:

> The Task Force, keeping in mind the requirements of the University for high quality libraries to support its programs, and with due regard for the need to realize all reasonable economies in the expenditure of funds for the library system, shall propose to the President specific policy principles and objectives in the following areas:
>
> 1. The provision of Universitywide service, including principles, objectives, and specific major steps of regional planning.
>
> 2. Criteria for acquisitions:
>
>   a. primarily for use on one campus,
>
>   b. for multicampus use, and particularly for regional service centers.
>
> 3. Criteria for identifying and designating appropriate locations for special collections whose strengths need not or cannot be duplicated elsewhere in the University.
>
> 4. Criteria for decisions on added library physical facilities (with the exception of the already planned Santa Barbara library addition), whether primarily for campus use, or for facilities located on- or off-campus, to further the provisions of multicampus and regional service.
>
> 5. Criteria for implementation of the University's obligations under the Master Plan and for steps to be taken in cooperative arrangements with other institutions of higher education both private and public.
>
> 6. Criteria for user charges that should be levied, both as to when such charges are appropriate and as to their magnitude.

The Task Force will, of course, draw upon the expertise of the University faculty and staff to aid it in its work. It will also draw on the recommendations made by other review groups on selected aspects of providing library services in the University.

When specific policy principles and objectives have been proposed by the Task Force and subjected to appropriate administrative, Academic Senate, and student body reviews, and when the President has made his decisions on broad policies and

objectives, technical groups will be appointed and assigned to work out implementation, subject to appropriate reviews. Major portions of the work are to be completed in time for use in preparation of the 1975-76 operating and capital budget.

Computer Resources

For the past 20 years, instructional and research computing in the University have developed primarily in a decentralized manner, and administrative computing in a separate and centralized manner. This is not an adequate approach to planning and operating future computing resources.

Several studies of the computer needs of the University have been made in recent years including the 1972 National Science Foundation Network study and that of the more recent Academic Council Task Force on Educational Policy Aspects of Computing. On the basis of this work and other sources of information, a Task Force on Computer Policy has reported to the President on the problems facing the University and the opportunities for further utilization of these powerful resources. In its work, the Task Force noted that any system-wide policy must consider the totality of computing facilities -- including those used for administrative data processing and those of the two major AEC facilities at Berkeley and Livermore.

While present needs are generally being met, in some cases the services are less than optimal and in a few cases inadequate. The financial position of campus computing centers is not stable. A major deficiency is the amount of time or money available for the instructional uses of computers.

The Task Force concluded that technology is no barrier to any proposed management model. Indeed, technology is producing pressures toward both centralization and decentralization. Among the factors pushing toward centralization and networks, terminals, large data bases, time-sharing, complexities of fourth generation computing, and the costs of software and personnel. Adequate technology for networks already exists and the use of networks appears "inevitable." Among the potential benefits available by using networks are: economies of scale, load leveling, competition, choice of resources, stability, matching of user and capability, larger data bases, and wider accessibility. Factors contributing to decentralization include minicomputers, cheaper hardware, small time-sharing systems, some widely available software, and certain specialized and dedicated systems. The use of minicomputers is expected to expand, and this is acceptable and generally desirable as long as such equipment can be acquired and operated without causing academic or financial stress.

Management of computing resources is the key issue in enabling the University to cope better with both technical developments and financial constraints. At the Universitywide level, the relationship of computer management to the President, the Chancellors, and the Laboratory Directors has been reviewed and is being revised. At the campus and laboratory level, the local management of computers must similarly be considered.

A Computer Policy Board was appointed in October, 1973, and reports to the President or the Vice President. It has as members the Vice President - Administration, one of the Vice Chancellors from each of the campuses, and representatives of the Lawrence Berkeley Laboratory and Lawrence Livermore Laboratory staffs, and is chaired by

the Vice Chancellor - Administration from the San Diego campus. The Board is now searching for an Executive Director of Computing, who will be a member of the Board and have primary responsibility for implementing policies approved by the President.

The University will very probably be utilizing one or more new large computers within the next two to five years. Although it is possible that such computers will belong to or be operated by vendors, it is more likely that the University will continue to manage these computer resources. Any major augmentation must be considered a Universitywide resource. While there is a necessary concern with computer hardware, the major expense associated with computing will be computer software and personnel. The cost of hardware is decreasing both absolutely and relatively to total computer costs. This fact underlines the need to give more consideration to the management and use of computing personnel. Similarly, additional study of software utilization is required. In certain situations it will be essential for the University to invest in system or application programs in order to reduce long-range expenditures.

Agricultural Sciences

The Agricultural Sciences have been an important part of the University of California since its creation, when the State Legislature stipulated that the first duty of the Board of Regents was to establish a College of Agriculture. This College was given a primary role: to seek to assure through education and research that adequate supplies of high-quality food and fiber would always be available to the citizens of the State. During the century since that commitment, developments in agricultural science and technology have helped to transform the State of California into a major center of food production for the nation.

Today, there is a dramatic shift in the world food situation. Food shortages and rising prices have become critical issues. The United States finds that exports of food and fiber are a major asset in international relations, both politically and economically. And, now, declining energy supplies are creating new needs in agricultural production research. These developments have focused new attention on the responsibilities of the Agricultural Sciences in the University.

The Agricultural Sciences are integrated into the University's teaching, research and public service functions in a unique organizational way. Agricultural scientists are engaged in formal undergraduate and graduate instruction:

* In the College of Agricultural and Environmental Sciences and the School of Veterinary Medicine at Davis.

* In the College of Natural Resources, formed by the scheduled merger of the College of Agricultural Sciences and the School of Forestry and Conservation at Berkeley, and

* In the College of Biological and Agricultural Sciences at Riverside.

Most faculty members in these colleges and professional schools hold appointments as research scientists in the Agricultural Experiment Station, the largest such facility in the United States. They conduct research on the three campuses, at nine field stations, and in various leased areas, experimental forests, and temporary plots located throughout the state.

Findings of Experiment Station research are carried to the public by various routes, but in particular through Cooperative Extension, a statewide organization created to disseminate new knowledge. Supported by State, federal, and county funds, it accomplishes its objectives through the teamwork of statewide subject matter specialists and county-based farm and home advisors. Cooperative Extension reaches the public through offices in 53 counties and through personal contact, meetings and workshops, publications, newspapers, radio, and television.

The Division of Agricultural Sciences has re-examined its programs to insure that research, teaching, and other public service will make the maximum contribution to current problems that resources permit. Two major changes are now underway:

* an intensification of efforts devoted to agricultural production, processing, and distribution, and

* a diversification of efforts to solve economic and social problems critical to an expanded agricultural development.

These efforts demand that the University intensify its research on the development of:

- radically different and improved breeding material.
- cropping systems that economize on energy and fertilizer use.
- systems of cropping and range management that make greater use of legumes for their nitrogen-gathering capacity.
- farm equipment that is more efficient in the use of energy.
- new sources of natural fibers.
- improved fiber performance.
- increased efficiency in fiber production.
- new sources of plant protein (e.g. leaf protein) for food use.
- expanded reproduction of animal proteins, both marine and of land origin.
- increased production and processing efficiency without loss of momentum in work on environmental protection.

Agricultural Sciences must also give increased attention to the base of renewable natural resources upon which all agricultural activity depends. For this reason the Experiment Station has increased its relative emphasis on natural and human resource concerns during the past five years. Cooperative Extension programs have moved in a similar direction. Whether the emerging crisis in food supplies and prices will necessitate some moderation of these trends to adjust priorities depends upon the availability of funds from State and Federal sources. But the pattern of the responsibilities facing the Station is clearly established.

Research and Cooperative Extension activities cover the following areas:

Food and Fiber Resources

Production Capacity and Efficiency - Effort in this area includes the development of new varieties of crops, new strains of livestock, and new management systems to provide improved quality and increased quantity of products.

Product Improvement and Marketing - Product improvement involves attention to problems of storage, processing and handling, particularly those relating to nutritional quality and product safety. Improved market efficiency involves analysis of market performance and consideration of the technical and economic aspects of the entire production, processing and marketing systems.

Protection of Plants and Animals - Control of pest and disease organisms is essential if present levels of productivity are to be maintained. This effort involves evaluation of the tradeoff between the benefits and ecological disturbance resulting from control methods. It includes the study of alternatives to chemical control and requires collaboration of control scientists, ecologists, economists, and experts in health and safety.

Disciplinary Research - Disciplinary research activities provide information and techniques basic to the continuing development of mission-oriented research programs.

Natural and Human Resources

Resource Conservation and Management - Emphasis here is on maintenance of environmental quality through better conservation and management of our land, water, and air resources.

Environmental Enhancement - Stress here is on multiple use of resources to enhance the environment and people's enjoyment of it and on alleviation of environmental pollution.

Family and Consumer Resources - This program emphasizes aid to the consumer and the family in making decisions about increasingly complex products and the health hazards from these products; in improving human diet and nutrition, health, and safety.

Community and Economic Development - This activity is concerned with the development of community resources and economic opportunities, with problems of education, sanitation, police protection, and other services in the community.

Youth Development - This area includes educational and action programs designed to help young people in personal growth and development of skills in science, citizenship, and leadership.

The changes shown in Table 4 reflect present plans to respond to social needs with increased efficiency in the use of available resources. Periodic review of goals may require their adjustment in the light of emerging national and international concerns.

Table 4
PROGRAMS OF THE DIVISION OF AGRICULTURAL SCIENCES

	Percent of Academic Staff		
FOOD AND FIBER RESOURCES	1968-69	1972-73	1976-77 (Projected)
Production Capacity and Efficiency	30	29	27
Product Improvement and Marketing	9	7	6
Protection of Plants and Animals	15	15	14
Disciplinary Research	5	5	4
Total	59	56	51
NATURAL AND HUMAN RESOURCES			
Resource Conservation and Management	7	7	8
Environmental Enhancement	8	8	10
Family and Consumer Resources	7	8	9
Community and Economic Development	1	2	4
Youth Development (4-H)	13	14	14
Disciplinary Research	5	5	4
Total	41	44	49
TOTAL	100	100	100

Health Sciences

Health care problems are among the most important current social concerns of the nation and the State, and the University has accordingly devoted a considerable share of its planning attention and resources to its health sciences programs. In 1970 the University submitted to the Legislature at its request a ten-year plan for the health sciences. In 1972 the President appointed a new faculty-administration-student committee to revise that plan to reflect the many developments which had already taken place in this fast-changing area. Later in 1972 the citizens of the State passed a $155.9 bond issue for construction of additional Health Sciences facilities at the University of California. The Report of the Committee for Review of the Ten-Year Plan for Health Sciences was made public in January of 1974, and contains detailed elaboration of program plans which are summarized very briefly here.

The University shares the widespread conviction held among those concerned with the nation's health that planning for the health sciences must take into account three imperatives: (1) to expand and diversify health professional education, (2) to improve the delivery of health care, and (3) to support the growth of health science knowledge and its application to health problems.

These objectives are so interlinked and overlapping as to be indivisible. The University places great stress on developing new programs to meet the State's need for expanded health manpower and improved health care. However, increased effort in these directions at the expense of the University's knowledge-generating function would prove short-sighted. Ways must be found to increase the University's total health sciences effort and to establish and preserve a suitable balance among teaching, research, and health care.

The University's objectives in the health sciences are summarized in a series of programs, listed below, though not in priority order. These programs cut across University organization at all levels: campuses, schools, and departments. The list of programs is not to be duplicated on each campus, nor in each school, or department. Rather, each organizational component will make the kind and size of contribution which suits its own particular circumstances. Thus, it is the intent that the University's campuses, schools and departments will differ in program emphasis and size, but not in quality. The programs are:

* To relate postgraduate specialty education more directly to needs, with emphasis on increased output of primary care physicians.

* To foster the concept of the health professional team, both in education and function.

* To devise and test new approaches to a more effective health care system.

* To increase opportunity for entry and mobility in the health professions.

* To expand knowledge within the health sciences with emphasis on improvement of care and containment of costs of care.

* To seek higher productivity in relation to investment in University facilities with respect to both teaching and patient care.

* To address environmental problems as a fundamental determinant of the health status of the population.

* To establish the continuing education of health professionals as an essential joint responsibility of the University, the professional associations, individual members of the professions, and the employers of health professionals.

* To increase the output of academic health professionals to serve as faculty for expanded health science education at all levels.

* To contribute to public education in health in association with other educational institutions and communications media.

Implementation of these programs obviously requires heavy reliance on a wide variety of clinical resources. Principal among these are hospitals and clinics owned and/or operated by the University. It must be emphasized, however, that the programs cannot be carried out at these facilities alone; they depend in many ways on the contributions made by such other clinical resources as community and government hospitals and clinics and other, non-hospital, health care agencies.

At the present time, the University operates teaching hospitals at Los Angeles, Sacramento, San Diego, and San Francisco. In addition, an agreement with Orange County enables the University to utilize the Orange County Medical Center as the principal site for clinical training for students of the California College of Medicine at Irvine. These facilities are utilized in varying degrees by the programs of the five schools of medicine, two schools of nursing, the school of pharmacy, two schools of dentistry, and two schools of public health in the University of California. Additional major clinical activities are carried out at the University-operated dental and optometry clinics and the veterinary medicine hospital at Davis.

The need for access to University-operated clinical resources does not mean that each health science school should duplicate the clinical resources found in connection with such relatively long-established medical schools as those on the San Francisco and Los Angeles campuses. Planning for clinical facilities for all health science schools will take into account the availability of resources already on the campus and in the community, the program emphasis of the school, and other pertinent factors.

While the University's major responsibilities in health sciences are teaching and research, many activities of the medical centers involve more direct service to the public. Principal among these are the patient care activities necessary for teaching and research. During 1972/73, the University's hospitals and clinics provided almost half million days of in-patient care, and accommodated another half million out-patient visits. Patients from all parts of California (and a few referrals from out-of-State) are seen by the faculty in the University's hospitals and clinics as well as in the affiliated hospitals. Moreover, the presence of a medical school and teaching hospital in a community is generally accepted as having a beneficial effect on the standards of medical care in that community and provides important opportunities for continuing education for practicing health professionals.

Many research projects in the health sciences involve activities which result in direct service to the public. Furthermore, the health centers are heavily involved in consulting services to community social agencies, such as schools, welfare departments, and probation agencies on such topics as drug use and misuse and the special problems of disturbed children.

The continuing education programs in the health sciences have experienced steady growth. Not only physicians and dentists, but nurses, pharmacists, laboratory technologists, and others in the paramedical professions avail themselves of opportunities to maintain their level of education and function. This program brings the work of the research laboratory to the practicing professions in an important service which is clearly in the public interest.

The University, through its five medical schools, will increase its participation in efforts to develop cooperative arrangements between medical centers, community hospitals, and research institutes for the purpose of improving health services and the delivery of such services throughout the State. Each of the medical schools serves as a focus for the development of programs within its general area, utilizing resources within the medical school and the area around it for the benefit of the entire State.

CAMPUS PROFILES

At the current stage of the University's academic planning process, the campus profiles which make up the bulk of this section are necessarily descriptive and preliminary. They were derived from discussions between the APPR Board and the campuses and are useful primarily to indicate the general directions that the developing campus academic plans are taking. Detailed, operational campus plans are now being developed through the iterative process described in the earlier section on "Academic Planning and Program Review Processes," and the plans will be reviewed on a regular basis and revised as necessary through these same processes.

As noted in the section on "University Planning Objectives for the 1970s," it is imperative that all university-level programs of scholarly and professional importance be presented somewhere within the University of California and that their distribution and development on the several campuses be planned to achieve a total spectrum of University offerings of breadth and quality not attainable in a single-campus institution of higher learning. To this end, each University campus must be a distinctive and complementary part of a planned whole. The inventory of approved University of California degree programs presented in Appendix 1 indicates the extent to which this objective is presently met. As Campus Academic Plans mature, this inventory will be updated and information about future degree programs that are planned will be incorporated.

Though it is presently expected that the University by the end of this decade will reach a plateau of development in size on which it may remain through much of the 1980s, there is always the possibility that conditions now unforeseen will present the University with new needs and opportunities for growth and development. The intent of this Academic Plan is to maintain the campuses of the University in a state of vigorous health and activity, ready to meet current needs efficiently and economically, and equally ready to respond to new needs for growth and development as these may appear.

Most of the campus profiles concentrate on instructional programs without reference to programs of organized research. Instructional programs, in the University context, do involve a large component of research. Beyond this, however, the organized research units (ORUs) on the various campuses contribute to the University's instructional role and resources, particularly at the graduate level. A fuller discussion of the University's ORUs and of the policies which govern them appears in the sections on program review and research, and a current list of approved ORUs is given in Appendix 2.

It should be noted that the actual Fall, 1973 enrollment figures which are given in the campus profiles are larger than the estimated 1973-74 figures presented in Tables 1 and 2. The figures in the tables are three-term averages, which are always smaller than the actual enrollment figures for the Fall Quarter. The three-term average figures for 1973-74 that appear in Table 1 are estimates, because the enrollments for the Spring Quarter of this year are not yet known. The statements in the profiles

about the proportions of students majoring in various fields have to be based on Fall 1972 figures, however, because that is the latest time for which such information is presently available for most campuses. It is important to note that the statements about the proportions of majors in the various fields are not intended to indicate the total instructional workload in those fields. Instructional workload in a field also includes service courses for majors in other fields; this is a particularly important component of the workload in certain fields which do not attract large numbers of majors -- mathematics is perhaps the most notable example.

Following the campus profiles there is a section which describes the activities and programs of the major Atomic Energy Commission laboratories at Berkeley, Livermore, and Los Alamos.

UNIVERSITY OF CALIFORNIA - BERKELEY

State of Development--Size and Scope

Berkeley is the senior general campus of the University. It is one of a small number of major research universities in the United States. In addition, the campus has an international status in graduate education and offers training in an extensive range of professions and advanced technologies. In Fall, 1973, Berkeley's enrollment of 20,777 undergraduates and 8,584 graduates on the general campus and 545 in the two health science schools exceeded the planned 27,500 steady-state ceiling of the campus. These enrollments were distributed across the following sixteen academic units:

Arts & Sciences College	Professional Colleges	Professional Schools	Special Purpose Department
Letters & Science	Agricultural Sciences	Business	Ethnic Studies
	Chemistry	Criminology	
	Engineering	Education	
	Environmental Design	Forestry & Conservation	
		Law	
		Librarianship	
		Optometry*	
		Public Health*	
		Public Policy	
		Social Welfare	

Academic Thrust

At the undergraduate level, Berkeley offers an outstanding educational experience to able students who have well-defined goals for their undergraduate programs. The campus will seek to develop and expand selected undergraduate programs in the professional schools and colleges in order to use the faculty resources available in these programs more intensively, to absorb some of the workload pressures now bearing on the social science departments of the College of Letters and Science, and to provide alternative options for undergraduate students.

At the graduate level, Berkeley's Ph.D. programs are of outstanding quality. Thirty-five of Berkeley's programs were rated by Roose-Andersen in the 1969 report,

*Health Science Units

A Rating of Graduate Programs, prepared for the American Council on Education. Berkeley had thirty-two of its programs among the top five, and eighteen among the top two, in the nation. The campus will continue to offer outstanding doctoral programs in a broad spectrum of fields. The following list shows the doctoral programs (including professional doctorates) that are presently offered. All programs are for the Ph.D. except as indicated otherwise.

Agricultural Chemistry
Agricultural Economics
Anatomy
Ancient History and Archaeology
Anthropology
Applied Mathematics
Architecture
Asian Studies
Astronomy
Atmospheric and Space Sciences
Bacteriology
Biochemistry
Biophysics
Biostatistics
Botany
Buddhist Studies
Business Administration
Chemical Engineering
Chemistry
City and Regional Planning
Classical Archaeology
Classics
Comparative Biochemistry
Comparative Literature
Comparative Pathology
Computer Science
Criminology (D. Crim.)
Demography
Dramatic Art
Economics
Education (Ph.D. and Ed. D.)
Endocrinology
Engineering (Ph.D. and D. Engr.)
Engineering Science
English
Entomology
Environmental Health Sciences
Environmental Planning
Epidemology
French
Genetics
Geography
Geology
Geophysics
German
History
History of Art
Immunology
Italian
Latin-American Studies
Law (J.D. and J.S.D.)
Librarianship (Ph.D.) and D.L.S.)
Linguistics
Logic and the Methodology of Science
Mathematics
Medical Physics
Microbiology
Molecular Biology
Music
Near Eastern Studies
Near Eastern Religions*
Neurobiology
Nutrition
Optometry (D. Opt.)
Oriental Languages
Paleontology
Parasitology
Philosophy
Physics
Physiological Optics
Physiology
Plant Pathology
Plant Physiology
Political Science
Psychology
Public Policy
Public Health (Dr. P.H.)
Rhetoric
Romance Languages and Literatures
Romance Philology
Scandinavian Languages and Literatures
Science/Mathematics Education
Slavic Languages and Literatures
Social Welfare (D.S.W.)
Sociology
Soil Science
South and Southeast Asian Languages and Literatures
Statistics
Wildland Resource Science

*Joint with Graduate Theological Union

Wood Science and Technology
Zoology

Planning for the Steady State

Berkeley's operational plan, by which it will pursue its programmatic objectives within the constraints imposed by its steady-state enrollment, has three main elements:

1. It will seek to control the internal distribution of its enrollment through admissions control procedures.

2. Within its total of faculty positions, it will hold a continuing pool of FTE positions for "temporary" appointments, i.e., appointments not committed to regular, ladder-rank incumbents. These positions (and dollars) that are not permanently committed will be used flexibly each term to finance non-ladder staff as required to meet enrollment-generated classroom needs.

3. It will restrict new appointments to regular faculty ranks to the total of projected releases from these ranks by resignations, retirements, and deaths. As part of this process, it will allocate the new appointments according to the academic priorities developed in the course of campus program review activities.

The third element of this scheme, the regular faculty renewal plan, is based on a budget policy which is derived from (a) an analysis of non-tenure and tenure rates of progression (promotions, separations, resignations, retirements and deaths) during the period 1963-64 through 1971-72, and (b) a projection through 1990-91 of the effects of a variety of combinations of such rates (within the framework of an assumed steady-state regular faculty). The faculty renewal plan provides quantitatively for a steady flow of new faculty, amounting to about 5% of total faculty each year, or a total number equal to 50% of total regular faculty over a 10-year period.

Program Review

For development of new programs within the steady-state, Berkeley will emphasize self-renewal, development and evolution within existing operating units rather than creation of new operating or budgetary units. The administration is working with Senate committees to develop a systematic, periodic review of all academic units, having in mind the goal of stimulating critical self-examination, self-renewal, and development within existing programs. The character of program review becomes a critical element in maintaining vitality in the steady-state.

Within the College of Letters and Science, both undergraduate and graduate programs are being reviewed. Graduate programs will be reviewed not only for quality and direction, but also for size and relation to potential job markets for graduates.

In the professional schools and colleges, special attention is being given to those that are concerned with application of the social sciences, involving consideration of both relation to the professions, and interaction with other campus units. Questions have been raised about the quality, size, and scope of the programs in Criminology and

Social Welfare, and consideration is being given to possible major recasting of their programs and goals. The College of Agricultural Sciences and the School of Forestry are now being combined and will soon constitute the College of Natural Resources within the next year, as noted in the earlier section on academic planning and program review processes, all University of California Schools of Education, Engineering, and Administration, including those at Berkeley, will undergo Universitywide review. In addition, the size and scope of health science programs on the Berkeley campus are currently under review.

UNIVERSITY OF CALIFORNIA - DAVIS

State of Development--Size and Scope

In the sixty-five years since University work was established at Davis, the campus has evolved from the University Farm School into a diversified and generally well-balanced institution. The College of Agriculture, whose development began in the first decade of the twentieth century, grew to maturity over a period of forty years. In the 1960s, during an era of reorganization and expansion, it became the College of Agricultural and Environmental Sciences. The School of Veterinary Medicine was established in 1946, bringing to California for the first time professional education and research facilities in veterinary science. The College of Letters and Science, organized in 1951, developed instructional and research programs in the fundamental disciplines of the natural sciences, social sciences, arts, and humanities.

The Regents declared Davis a general campus of the University in October, 1959. Since that time, academic expansion has been rapid and continuous. The College of Letters and Science has become the core instructional unit on the campus. The engineering curriculum, initiated in 1959, led to establishment of the College of Engineering in 1962. The Graduate Division was established as a separate administrative unit in 1961. The School of Law opened in 1966, and the School of Medicine admitted its first students in 1968. The Division of Extended Learning, coordinating part-time degree programs, was established in 1972. These new programs have added diversity and academic strength to the campus. A Graduate School of Administration was authorized by The Regents in 1967 but has not yet been funded.

In Fall 1973 enrollments at Davis were as follows:

General Campus	
Undergraduate	11,542
Graduate	2,807
Health Sciences	1,274
Total	15,623

At the undergraduate level, the fields of agriculture and natural resources, biological sciences, and social sciences presently attract the largest percentages of majors on the general campus. Agriculture and natural resources and law enroll the highest percentages at the graduate level on the general campus. Health sciences account for almost one-third of graduate enrollments.

The campus is expected to maintain a growth rate of between 500 and 1,000 students

per year until 1975-76. This rate of growth will be reduced to approximately 200 students per year in 1976-77 after undergraduate enrollments reach planned maximum levels. Projected enrollment for 1977-78 is:

Undergraduates	12,100
Graduates	3,600
Health Sciences	1,700
Total	17,400

Academic Thrust

At present, the Davis campus provides instruction in more than 115 major program areas. The instruction ranges across both fundamental disciplines and mission-oriented fields. Graduate training is provided in more than 60 of these fields, in 43 of which the doctorate is offered. Graduate groups are widely used to facilitate interdisciplinary and interdepartmental programs. At least one-half of the Ph.D. programs are well-established and have attained national and international recognition. A number of them -- chiefly in the biological sciences (the Davis program in botany ranked second in the nation) but also those in English, chemistry, physics, and several fields of engineering -- appear in the 1969 Roose-Andersen A Rating of Graduate Programs, done for the American Council on Education. The other programs are in process of maturing. There is a heavy concentration of graduate instruction in agriculture, biological sciences, physical sciences, and engineering, as may be seen from the following list of doctoral programs (the list includes professional doctorates):

Agricultural Chemistry
Agricultural Economics
Anatomy
Anthropology
Atmospheric Science
Biochemistry
Biomedical Engineering
Biophysics
Botany
Chemistry
Comparative Pathology
Dramatic Art
Ecology
Economics
Endocrinology
Engineering (D. Eng. and Ph.D.)
English
Entomology
French
Genetics
Geography
Geology
German
History
Individual Interdepartmental Ph.D.
Law (J.D.)
Mathematics
Medicine (M.D.)
Microbiology
Nutrition
Pharmacology and Toxicology
Philosophy
Physics
Physiology
Plant Pathology
Plant Physiology
Political Science
Psychology
Sociology
Soil Science
Spanish
Veterinary Medicine (D.V.M.)
Zoology

At the undergraduate level, the academic objective of the Davis campus is to offer a wide variety of academic programs, striking a balance between the discipline-oriented

offerings of the College of Letters and Science and the mission-oriented offerings of the College of Agricultural and Environmental Sciences and the College of Engineering. The Davis campus recognizes the need to serve four general categories of undergraduates: (1) those to whom undergraduate study represents specific preparation for further formal education and entry into a graduate academic or professional school; (2) those to whom undergraduate study represents preparation for a specific career that normally requires no post-graduate training; (3) those to whom undergraduate study represents a general or liberal arts education beyond the high school level; and (4) those whose current and future objectives are undecided or unclear. Special attention is given at Davis to the last-named category of students, including the development of a new undergraduate studies program and of special counseling services.

Davis will remain the major center in California for University level teaching and research in the agricultural and environmental sciences and will strive to maintain and improve the already high level of quality which characterizes the campus's biological sciences programs. New academic graduate programs emerged in the 1960s in the arts, humanities, social sciences, physical sciences, engineering, and education. It is anticipated that the quality of these graduate programs will continue to improve as they move toward maturity.

Program Review

In the next five years, the primary planning goal at Davis will be to anticipate the problems of steady-state enrollment and adjustment to an era of institutional maturity. (The campus expects to attain its ultimate size of about 16,200 on the general campus early in the 1980s.) This will require a thorough review of existing academic programs and curricula, at both the undergraduate and graduate levels. Experiments in the use of instructional media will be encouraged. Graduate groups will be emphasized as a way of initiating innovative instructional programs without compromising academic quality and as a means of organizing academic resources for research on the complex problems of contemporary society. Systematic planning will be undertaken to insure flexibility in academic programs, to provide for internal reallocation of resources as necessary, and to sustain the intellectual vitality of the faculty. Continuing efforts will be made to increase teaching effectiveness and enhance learning at all levels of instruction, including Extended Learning.

UNIVERSITY OF CALIFORNIA - IRVINE

State of Development--Size and Scope

The Irvine campus is located on a section of the Irvine ranch in what is now the City of Irvine adjacent to Newport Beach in Orange County. The campus was opened in 1965 as a general campus offering instruction at the graduate as well as the undergraduate level.

In Fall 1973 enrollments at Irvine were approximately as follows:

General Campus

Undergraduate	6,623
Graduate	1,063
California College of Medicine	680
Total	8,366

Tables 1 and 2 project 1977-78 three-term average enrollments for undergraduates, graduates, and the health sciences at approximately 6,400, 1,100, and 906, respectively. It should be noted that the Fall, 1973 Irvine enrollment at the undergraduate level is considerably in excess of the estimate for 1973-74 presented in Table 1. This discrepancy will be taken into account in future revisions of the long-term projections, as outlined in the discussion of enrollment projections in an earlier section.

In contrast to the college system of the two other campuses developed at the same time -- San Diego and Santa Cruz -- Irvine organized itself by schools designed to house related disciplines. Within these schools it was planned to foster interdisciplinary arrangements. The schools range from organizations that have no departments (Social Sciences), through those with graduate departments only (Biological Sciences), and those with "programs" (Fine Arts) to those with conventional departmental structures (Physical Sciences and Humanities).

In Humanities, undergraduate students do not officially major until the junior year, and various programs cross over departments. Units that have grown up outside the five-school structure are in themselves interdisciplinary developments. Some of the graduate programs have produced a considerable number of graduate degrees already, notably those in physics, chemistry, biology, and English. A number of the schools and programs have pioneered innovative curricula at both graduate and undergraduate levels, particularly Biological Sciences with its new organization of disciplines within the fields; Fine Arts, with its emphasis on the convergence of the arts in performance; English, which emphasizes literary theory and the M.F.A. degree in creative writing; Social Sciences, which has a highly interdisciplinary approach; Social Ecology, with its innovative approaches to field study, and Comparative Culture, which has expanded American studies to include the ethnic and comparative dimensions.

In addition to the five schools listed above, Irvine contains three programs -- Information and Computer Science, Physical Education, and Teacher Education -- and four professional schools - the Graduate School of Administration, the Graduate School of Education, the School of Engineering, and the California College of Medicine. Attached to the campus is a large program in Extension which serves the major population area of Orange County. Irvine has recently developed several fledgling programs in the Extended University.

Nearly one fourth of the undergraduates at Irvine are biological science majors. Other fields particularly popular with undergraduates are the social sciences and fine arts. At the graduate level, the health sciences account for more than 40 percent of the total enrollment. On the general campus education, letters, the biological sciences, and the social sciences have the largest proportions of graduate students.

Academic Thrust

The original plan for development of the Irvine campus called for an eventual student population of 27,500, with development to proceed evenly along all fronts. In response to reduced expectations for growth, the campus is adopting measures which will assure the preservation and vitality of its existing academic programs. The programs now in operation form the essential framework of the general campus as originally conceived. Emphasis during the present planning cycle will be placed on more complete development of the programs now in existence. The campus will facilitate more interchange among programs to meet the needs of students whose interests extend beyond one discipline. In its undergraduate programs the campus is dedicated to the values of the traditional liberal arts education. The Irvine Divisional Senate Committee on Educational Policy is currently engaged in an intensive study of means by which this commitment can be more effectively implemented during the current planning cycle.

The following doctoral programs (all Ph.D. programs except the M.D. in the California College of Medicine) are offered:

Administration
Biological Sciences
    (A single degree, but with specialization in
    Development and Cell Biology
    Molecular Biology and Biochemistry
    Population and Environmental Biology
    Psychobiology)
Chemistry
Classics
Comparative Culture
Comparative Literature
Engineering
English (also M.F.A. in Creative Writing)
French
German
History
Information and Computer Science
Mathematics
Medicine (M.D.)
Pharmacology and Toxicology
Philosophy
Physics

Political Science
Psychology
Radiological Sciences
Social Sciences
Spanish

Program Review

Many of the graduate programs were established when the Irvine campus began in 1965 and have developed rather fully. Others have begun operation more recently. Their progress will be monitored closely as part of the program review process.

UNIVERSITY OF CALIFORNIA - LOS ANGELES

State of Development--Size and Scope

Los Angeles is a large, fully mature campus containing broadly based general campus and health sciences programs of high quality. There are seven professional schools on the general campus, a College of Fine Arts, a wide range of disciplines in the College of Letters and Sciences, and academic, professional, and post-graduate programs in the health sciences. Organized research units associated with these programs or cutting across the entire campus contribute significantly to the instructional programs.

The professional schools on the general campus are:

School of Architecture and Urban Planning
Graduate School of Education
School of Engineering and Applied Science
School of Law
School of Library Service
Graduate School of Management
School of Social Welfare

The 33 departments in the College of Letters and Science are organized into four divisions: Humanities, Life Sciences, Physical Sciences, and Social Sciences. The College of Fine Arts includes four departments: Art, Dance, Music, and Theater Arts.

Instruction in the health sciences is offered in the Schools of Dentistry, Medicine, Nursing, and Public Health. The basic science departments in the School of Medicine also contribute heavily to programs in the other areas, particularly Dentistry. Interns and residents as well as medical students are trained in an excellent teaching hospital located on the campus, at the UCLA-administered Harbor General Hospital, and through cooperative arrangements with several other hospitals in the Los Angeles area.

In Fall 1973 there were 20,030 undergraduates and 8,055 graduate students on the general campus with an additional enrollment of 3,071 in the health sciences. By 1977-78 it is expected that three-term headcount enrollments will have approximately 19,000, 8,000, and 3,000, respectively. After that, enrollment is expected to remain at the 1977-78 level.

About one-fourth of the undergraduate majors at UCLA are in fields of the social sciences, and a similar proportion of graduates is in the health sciences. Half of the graduate students on the general campus are in the various professional schools. Psychology, biological sciences, fine arts, and letters have quite substantial proportions of undergraduate majors, though they are far outdistanced in this respect by the social sciences.

Academic Thrust

Almost all undergraduate degree programs are in the Colleges of Letters and Science and Fine Arts. Most of these are departmental majors, but a number are interdisciplinary. An interdisciplinary major in Ethnic Arts, which combines programs in Letters and Science and Fine Arts, has recently been introduced. Undergraduate degree programs are also available in the School of Engineering and Applied Science, the School of Nursing, and the School of Public Health.

In addition to serving its own majors, the College of Letters and Science provides most of the general education courses for majors in other colleges and schools. It also offers a number of two to three year pre-professional programs, primarily as preparation for work in the health sciences. Undergraduate courses are offered by many of the professional schools in both the general campus and the health sciences areas, either as a contribution to general education or as preparation for more advanced work. A number of professional schools have recently joined together to offer a sequence of undergraduate courses directed toward students intending to enter graduate training in a profession. These courses are designed to prepare the individual for complex professional decision making before entering higher level specialization.

Graduate academic programs are available in all departments in the Colleges of Letters and Science and Fine Arts, in the professional Schools of Architecture and Urban Planning, Education, Engineering and Applied Science, Management, Public Health, and Medicine.

The campus offers the following Ph.D. programs and professional doctorate programs:

GENERAL CAMPUS:

Anthropology
Archaeology*
Art History
Astronomy
Biochemistry
Biology
Chemistry
Classics
Comparative Literature*
Computer Science

* Interdepartmental programs

Economics
Education (Ph.D. and Ed. D.)
Engineering
English
Environmental Science and Engineering (D.Env.)
French
Geochemistry*
Geography
Geology
Germanic Languages
Hispanic Languages & Literatures
History
Individual Interdisciplinary
Indo-European Studies
Islamic Studies*
Italian
Law
Linguistics
Management
Mathematics
Meteorology
Microbiology
Molecular Biology*
Music
Near Eastern Languages & Literatures
Oriental Languages
Philosophy
Physics
Planetary & Space Physics
Political Science
Psychology
Romance Linguistics & Literatures
Slavic Languages & Literatures
Social Welfare (D.S.W.)
Sociology
Special Education**
Theater Arts
Urban Planning

HEALTH SCIENCES:

Anatomy
Biological Chemistry
Biomathematics
Biostatistics
Dental Surgery
Dentistry (D.D.S.)
Microbiology & Immunology
Medical Physics
Medicine (M.D.)
Neuroscience*
Pharmacology
Physiology
Public Health (Dr.P.H.)

Thirty-six UCLA graduate programs were covered in the 1969 Roose-Andersen report on quality in graduate education. Twenty-eight received "strong" or "distinguished" ratings, 12 were ranked among the top ten institutions, and Linguistics was ranked second in the nation.

The core academic programs in the physical and social sciences, the humanities, and some of the foreign languages contribute to both graduate and undergraduate programs in all fields and to graduate professional programs, including those in the health sciences. Future priorities will be based primarily upon further strengthening and maintaining excellence in present programs, particularly those in core areas, while providing for extension of the educational enterprise into newly emerging fields. Many of the latter are expected to be interdisciplinary or multidisciplinary in scope, often with greater participation from the professions, including the health sciences.

* Interdepartmental programs
**Joint program with Los Angeles State University

High priority will also be given to several areas of unique specialization or distinction including a number of foreign area studies, certain aspects of the fine arts, exotic languages and linguistics, the earth sciences, and the newer programs in ethnic studies and environmental studies. These programs contribute major interdisciplinary strength in both graduate and undergraduate instruction as well as in research, and often cut across departmental and college lines.

In conjunction with the above-noted emphases, the major strength of the undergraduate program at UCLA has been and will continue to be in preparing students whose career goals are well defined for future graduate and professional work. About 58% of UCLA's baccalaureate students have gone on to pursue graduate education. At the same time, the curriculum will provide for the student who has not yet defined his interests by allowing him the opportunity for broad exposure to a variety of disciplines before focusing on a specific educational goal. Curricular innovations which allow the student an opportunity to pursue interdisciplinary interests, as well as those which prepare him for graduate work in traditional fields, will continue to be developed.

Faculty Renewal

The management of the resources represented by the faculty will be an important part of planning at UCLA. One of the campus objectives is to maintain a continuous influx of new ideas and new talent into the faculty. This can be done by careful recruiting combined with wise use of positions which become vacant through separations, resignations, retirements, deaths, and sabbatical leaves.

Program Review

Program review is conducted as an important means of insuring the maintenance of quality, of evaluating the extent to which current programs are responding to student interests and the needs of society, and of identifying resources that could be better used in other programs. As the campus approaches more nearly its steady state, these reviews will become an even more essential part of the resource allocation process.

In addition to regular and special reviews conducted by the Academic Senate, ad hoc reviews of specific programs are conducted whenever necessary or appropriate. This process will result in establishment of more detailed program priorities including consideration of the optimal scope and specialization of each program.

UNIVERSITY OF CALIFORNIA - RIVERSIDE

State of Development--Size and Scope

In the Fall Quarter, 1973, Riverside had an enrollment of 4,098 undergraduates and 1,278 graduate students, a total of 5,376. These enrollments were distributed among

the following seven units:

The College of Biological and Agricultural Sciences
The College of Humanities
The College of Physical Sciences
The College of Social and Behavioral Sciences
The Division of Undergraduate Studies
The Graduate School of Administration
The School of Education

The University's presence at Riverside dates from 1907, when the Citrus Experiment Station was founded. An undergraduate liberal arts college was established in 1954, and in 1959 The Regents decided that the mission of the campus should be broadened to include graduate instruction and research. In 1960 a College of Agriculture was established. The Graduate Division began operation in 1961. The present multi-collegiate structure was established in 1970. The campus now has both the variety and quality in program which are properly associated with an excellent small university.

Very large proportions of the undergraduates at Riverside major in the social sciences and the biological sciences. At the graduate level the social sciences, education, agriculture and natural resources (which incorporates a large element of biological science) and the physical sciences are the most heavily subscribed fields.

Academic Thrust

At the undergraduate level Riverside offers a high quality undergraduate education in all of the usual fields. The campus has a reputation for the quality and rigor of its programs and for close faculty-student contacts, to which the campus has been committed from the inception of undergraduate work in 1954. Interdepartmental programs are encouraged. For students who have not declared a major the Division of Undergraduate Studies provides guidance and opportunities for intellectual exploration.

In many respects, the undergraduate program at Riverside resembles that of a large general campus with a broad range of intellectual activities in the sciences, arts, and humanities. However, because of its smaller size, Riverside can offer students an environment and an intimate style of interpersonal relationship different from those at the larger campuses. As a result, many Riverside students undertake independent research, often publishing the results of projects completed during their senior year. Internships in government or industry are commonplace in many departments, and the sciences have set up a formal Industrial Liaison Committee with Southern California Industries to promote relationships with the industrial community. Innovation in the undergraduate programs has been and will continue to be encouraged, always with the intent that innovation will be consistent with University education and the quality and rigor that have always characterized the undergraduate program at Riverside.

Graduate education at Riverside is characterized by the same close student-faculty relationship that distinguishes undergraduate education there. Ph.D. and professional doctoral programs are authorized in thirty fields. The Riverside graduate programs in English and history, in several fields of the biological sciences including entomology (in which Riverside's program was ranked fourth in the nation), and in several of the physical and mathematical sciences appear in the 1969 Roose-Andersen A Rating of Graduate Programs.

Administration
Anthropology
Applied Statistics
Biochemistry
Biology
Botany
Chemistry
Comparative Literature
Ecology*
Economics
Education
English
Entomology
French
Genetics
Geography
Geological Sciences
German
History
Mathematics
Philosophy
Physics
Plant Pathology
Plant Physiology
Political Science
Population Biology
Psychology
Sociology
Soil Science
Spanish

Since masters programs are offered in most of the Ph.D. areas and in four others as well (art history, plant science, music, and theatre), graduate work at Riverside is characterized by much the same broad range as the undergraduate program. Within the limits of campus resources, breadth in graduate education will be maintained.

In order to maintain a high level of quality, the tendency in most areas of Ph.D. instruction has been to offer work in selected sub-fields rather than to attempt to cover the entire spectrum of the discipline. The campus will be encouraged to move further in the direction of consolidation of programs within each discipline, but care must be taken not to narrow offerings to a point that would eliminate the breadth of program necessary to insure a high quality Ph.D. for the student.

In several graduate programs in the social sciences and humanities a relatively small number of Ph.D.s have been awarded to date. However, many of the departments with low output now have a significant number of students advanced to candidacy, and in the near future their output may increase. Where it becomes apparent that programs neither attract enough students nor have a sufficient output of degrees awarded to justify the resources allocated to them, consideration will be given to modifying or phasing out those programs. It is essential that all programs continue to be scrutinized to assure that quality is not impaired. If it should become apparent that the campus cannot support all of the present Ph.D. programs at an adequate level of quality, the campus must be prepared to phase out programs of lower quality

*Joint Ph.D. program with San Diego State University.

in order to maintain the high quality of those programs which are to be retained.

Program Review

The campus will complete a thorough review of its entire program during the 1973-74 academic year, from which an achievable and acceptable plan for undergraduate and graduate education at Riverside will be prepared. Maintenance of breadth is important to the identity of the campus, particularly at the undergraduate level, but where choices must be made between maintaining high quality in selected areas and some reduction in breadth, quality must prevail.

UNIVERSITY OF CALIFORNIA - SAN DIEGO

State of Development--Size and Scope

The San Diego campus has evolved rapidly since 1958, when the first official steps were taken to broaden the activities at La Jolla, which had previously been limited to those of the Scripps Institution of Oceanography. The plan at first called for graduate teaching and research in science and engineering, and the initial enrollments in the new graduate school came in 1960. The campus admitted its first undergraduates in 1964. The medical school was authorized in 1962 and admitted students beginning in 1968.

In the Fall Quarter, 1973, San Diego had an enrollment of 6,190 undergraduate students, 1,097 graduates, and 664 health science students. The graduate students are mainly doctoral candidates in the instructional programs of the general campus, the Scripps Institution of Oceanography, and the School of Medicine. There are at present three semi-autonomous residential colleges (Revelle, Muir, and Third College); a fourth college has been approved and will open in Fall, 1974. The San Diego general campus is expected to grow by roughly 2,300 undergraduates and 400 graduates over the next five years.

More than one fourth of San Diego undergraduates are majoring in the biological sciences; other fields especially popular with undergraduates on the campus are the social sciences, the mathematical and physical sciences (taken together), and letters. About 40 percent of the graduate students are in the health sciences and the marine sciences. On the general campus the physical sciences, letters, the biological sciences, and the social sciences all have substantial shares of the graduate enrollments.

Academic Thrust

The collegiate structure is intended to enhance the personal development of the undergraduates and to stimulate and enrich their learning. These goals are realized by (a) the relatively small size of the colleges, wherein the students feel themselves to be members of a palpable and supportive community; (b) the greater opportunities for growth provided by more widely shared participation in the affairs of the community and contacts among its members; and (c) the diversity of the colleges' educational styles and contents, which enable students to select the college

which best serves their needs and goals. Revelle College offers a carefully structured program that assures for every one of its students the opportunity to get a balanced and comprehensive general education. It emphasizes science, and takes pride in the academic rigor of its program. Muir College stresses opportunities for choice among excellent options which include possibilities for independent study and research and permit a stronger involvement in the arts and humanities than the other colleges. Third College seeks to deepen students' understanding of economic and social issues, and of contemporary developments in communications, science and technology, urban and rural societies, and non-Western cultures. Fourth College is being planned to emphasize an education that will be useful in preparing for careers in a variety of professions, though without excluding students interested in other programs or majors.

While each college offers an integrated curriculum in the social sciences, natural sciences, humanities and arts sufficient for the baccalaureate degree, care is taken to avoid needless duplication among their programs, which are complementary rather than competitive. Indeed, most students take a portion of their courses outside their colleges. Such variety among the colleges and across the campus as a whole enables San Diego to attract many different kinds of well-qualified students. There is also a strong interaction between the undergraduate and graduate programs. The undergraduate college programs are planned to take advantage of the centers of graduate excellence and the interdisciplinary character of research and graduate instruction at UCSD. Thus, the colleges realize many of the finest qualities of the best liberal arts institutions while providing programs of a character and quality difficult to achieve outside a research university.

At the graduate level, San Diego is an established center of high quality instruction and research. The distinguished programs in the natural sciences with which it began have been or are being selectively complemented by a few Ph.D. programs in the health sciences, humanities, social sciences, and arts. Ten of San Diego's graduate programs -- including several in the physical sciences, several in the biological sciences, and its programs in English, philosophy, and Spanish -- appear in the 1969 Roose-Andersen A Rating of Graduate Programs. Eight of the programs scored in the "Strong" or "Distinguished" ranges. Currently established doctoral programs (all for the Ph.D. except that in Medicine) are:

Anthropology
Applied Physics
Biology
Chemistry
Comparative Literature
Comparative Studies in
  Language, Society and
  Culture
Earth Sciences
Economics
Engineering Sciences:
  Aerospace Engineering
  Applied Mechanics
  Bioengineering
  Engineering Physics
Experimental Pathology
History
Information and
  Computer Science
Linguistics
Literature, English and
  American
Literature, French
Literature, German
Literature, Spanish
Marine Biology
Mathematics
Medicine (M.D.)
Music
Neurosciences
Oceanography
Philosophy
Physics
Physiology and
  Pharmacology
Psychology
Sociology

The campus will continue its strength in graduate and research programs in the natural sciences, and will selectively develop its other programs. At an appropriate time a doctoral program in Political Science will be developed; when that occurs, this program, like all UCSD's doctoral programs, will have its own special style and will complement and strengthen related programs. A few new interdisciplinary doctoral programs will be established, some of them in the health sciences, if the need within the total University is clearly established, and if such programs require no resources beyond those scheduled to be available in the normal course of campus development. San Diego will not develop Ph.D. programs in all of the areas in which it offers undergraduate instruction.

Program Review

The campus has a system of annual program review that starts within each instructional department and culminates in recommendations for allocation or redistribution of resources by a standing committee which is the principal academic-administrative committee advisory to the Chancellor. Under this system all new programs and existing programs in which problems are perceived will be reviewed.

UNIVERSITY OF CALIFORNIA - SAN FRANCISCO

Status of Development--Size and Scope

The San Francisco campus history dates from 1864 when Dr. Hugh H. Toland founded the Toland Medical College. In 1873, the Toland Medical College was formally transferred to The Regents of the University of California and became a department of the University. Schools of Dentistry, Pharmacy, and Nursing as well as a Graduate Division were added. In Fall, 1973 the campus enrolled 2,923 students in its four health science schools (Medicine, Dentistry, Nursing, Pharmacy) and Graduate Division, with an increase to 3,532 students projected by 1979-80. Recent expansion has occurred in all of the professional schools and further enrollment increases are planned to help meet state and national needs for health manpower.

Academic Thrust

The San Francisco Campus is unique in the University in that it is the only campus whose programs are devoted exclusively to the health sciences. The broadly based academic programs in the arts and humanities found on the general campus are not present at the San Francisco Campus. Thus, other arrangements have been developed, such as cooperative programs with other UC campuses and other San Francisco educational institutions through a higher education consortium. In addition, new programs in biological, physical, behavioral, and social sciences essential to the performance of the campus mission in the health sciences are being initiated in the four existing professional schools with plans to transfer them to the planned School of Human Biology when a sufficient number of programs have been developed to provide a critical mass.

Basic medical sciences instruction for all campus programs is centered at the San Francisco site. While clinical instruction for all programs has a strong component on the Parnassas Avenue campus, major clinical centers have been developed at the San Francisco General Hospital, the Veteran's Administration Hospital, and many

other Northern California hospitals and other health agencies. The substantial affiliation program has been successful because it is integrated with the highly specialized on-campus facilities. Thus, the campus is able to provide a balanced clinical program for its students, including experiences in primary care settings as well as highly specialized settings. This arrangement has allowed the San Francisco campus to be developed into a major Northern California academic health sciences university with the broadest range of training programs for its students, a center of research and research training, as well as a major provider of health care to the people of California. The campus is a center of post-graduate education, including the training of future teachers and researchers. Efforts are directed at finding solutions to major disease problems and improving understanding of human development and health. Increasing emphasis has also been placed on providing continuing education programs for practicing health professionals to help meet the more stringent relicensing requirements which are being imposed and which can best be met under the auspices of a major health sciences center.

Development of graduate academic programs has concentrated in the basic health sciences as well as those biological, physical, behavioral, and social sciences directly related to health, including the well-being and quality of life. The campus has been an active participant in intercampus graduate groups. Students may earn graduate degrees in programs conducted in cooperation with the Berkeley, Davis, and Santa Barbara campuses.

The San Francisco campus is also a major independent center for graduate training in certain medical specialties, as well as for the basic health sciences. The following doctoral degree programs are offered (for the Ph.D. except as professional degrees are indicated):

Anatomy
Biochemistry
Biophysics
Comparative Pathology
Comparative Pharmacology and Toxicology***
Dental Surgery (D.D.S.)
Endocrinology***
History of Health Sciences
Immunology*
Medical Information Science
Medical Physics
Medicine (M.D.)
Microbiology
Nursing Science (D.N.S.)
Nutrition
Pathology
Pharmaceutical Chemistry
Pharmacology
Pharmacy (Pharm. D.)
Physiology
Psychology
Public Health (Dr.P.H.)
Sociology
Speech and Hearing Sciences**

* Joint with Berkeley
** Joint with Santa Barbara
***Joint with Davis and Berkeley

Program Review

Rapid changes in health care and in the setting of national priorities have led to a review and a number of innovations in all of the campus health sciences programs. A start has been made with the review of graduate degree programs. Revisions to plans have taken into account changing public needs, burgeoning scientific and clinical knowledge, increased diversity in the student body, and a growing awareness of the impact of social environment on illness.

The San Francisco campus routinely conducts annual reviews of the goals, objectives, and achievements of each School. In addition, the recently created campus Academic Planning Board will initiate detailed academic reviews of each department. The professional programs of each of the schools and many departments are thoroughly reviewed periodically by national accreditation review boards.

UNIVERSITY OF CALIFORNIA - SANTA BARBARA

State of Development--Size and Scope

Since it became a part of the University of California in 1944, the Santa Barbara campus has grown from a liberal arts college into a general campus of the University as authorized by The Regents in 1958. With 12,526 students (10,607 - 85% - undergraduates and 1,919 - 15% - graduates) in Fall 1973, it is the fourth largest campus of the University. Its distinctive characteristic lies in its being a medium size University campus with broad academic strength. Thus, Santa Barbara resembles the larger general campuses in the number and diversity of offerings and in departmental and curricula organization; but it is also like the smaller campuses of the University in its more limited professional offerings and the percentage of its undergraduate students. The campus has a College of Letters and Science which includes a comprehensive range of undergraduate programs and extensive graduate programs (the Ph.D. was first authorized in 1961), and two professional programs, the Graduate School of Education and the College of Engineering, begun in 1962. The College of Creative Studies was begun in 1967 to provide an unusual form of tutorially organized learning for able students in the fields of science, art and literature. The Santa Barbara campus also carries administrative responsibility for the Education Abroad Program for the entire University.

More than a fourth of the undergraduates at Santa Barbara are majoring in the social sciences; biological sciences, letters, and the arts also enroll substantial, though smaller, proportions of undergraduate majors. At the graduate level the social sciences, education, letters, the physical sciences and engineering have the largest enrollments. The biological sciences and the arts are also fairly well represented in the graduate enrollments.

As a medium size University with an active research faculty Santa Barbara will seek also to build an especially strong reputation for good teaching. The campus has appointed a Dean of Instructional Development whose primary responsibility is to coordinate efforts to improve undergraduate learning environments. The Dean also works closely with the Department of Learning Resources and provides central guidance for Special Undergraduate Improvement Fund programs. In addition, the campus has broadened the range of student options by changing the General Educa-

tion requirements, and a new program of Freshman Seminars aims to increase contact between new students and senior faculty.

In 1977-78 it is estimated that the enrollment will be approximately 13,300 (11,200 undergraduates and 2,100 graduates).

Academic Thrust

The rapid growth of the 1960s allowed UCSB to recruit faculty of high quality and to develop organized research units, classrooms, laboratories, and libraries. The focus for the 1970s is to use these strengths to continue to build distinction. Slower growth has provided time to evaluate academic programs more critically, to widen academic options for students, and to add depth in strong areas. With its growing capabilities, the campus intends: (1) to make good teaching an especially vital concern, (2) to encourage further the already strong commitment to the arts and cultural values (3) to seek additional ways to extend the value of the University to the neighboring communities and to society as a whole, and (4) to continue the development of interdisciplinary approaches in the sciences as an accompaniment to strong basic research. The basic elements for achieving the goal of distinction already exist at Santa Barbara in the form of its strong and broad program offerings, and the campus's size enhances the opportunity for interaction between faculty and students in both classroom and non-traditional settings.

Key characteristics of the Santa Barbara development have been the consistent drive toward breadth of offerings, quality in faculty and programs, and careful responsiveness to expressed needs. The liberal arts traditions of Santa Barbara have led to interdisciplinary majors such as Law and Society, Medieval Studies, Hispanic Civilization, and Comparative Literature which have grown out of the existing program. A new College of Interdisciplinary Studies has also been proposed to extend opportunities for interdisciplinary study. Also growing out of the existing programs are the nationally recognized undergraduate Environmental Studies Program and the Computer Science Program that links the College of Engineering with relevant departments in the College of Letters and Science. The College of Creative Studies will continue to receive strong support. The College utilizes existing disciplinary strengths in a successful innovation in undergraduate education. The campus will continue to utilize the Education Abroad Program to meet the academic objectives of the campus and of its students.

At the graduate level there are 36 programs leading to the Master's degree and Ph.D. programs in 27 major areas with the following titles:

Anthropology
Biochemistry and Molecular Biology
Biology
Chemical Engineering
Chemistry
Comparative Literature
Dramatic Art
Economics
Education
Electrical Engineering
English
French
Geology
Germanic Languages & Literatures
History
History of Art
Individual Interdisciplinary Ph.D.
Mathematics
Mechanical Engineering
Music Philosophy
Physics
Political Science
Psychology
Religious Studies
Sociology
Spanish
Speech and Hearing Sciences (with University of California, San Francisco)

The campus is considering plans for a Ph.D. in Classics (which might be a joint program with another campus).

Within the programs enumerated above the arts are remarkably lively, in keeping with the artistic and cultural traditions of the Santa Barbara community. Biological and physical sciences are all well developed, comprehensive programs. The professional fields of engineering and education are both represented by strong programs. Social sciences, letters, and psychology represent a significant portion of the campus enrollment as well as a large portion of its national visibility. Other programs unique within the University are those in Speech and Hearing Sciences, and the Urban Economics Internship Option in the Economics program.

A major issue in the further development of the Santa Barbara campus is the ordering of future priorities, particularly in graduate and professional education. The guiding principles are to be the building of distinction from strength and the selective development of programs, particularly well adapted to Santa Barbara, that permit specialization in a Universitywide context. One of the areas assigned high priority by the campus for further development is marine and aquatic biology. The location of the campus near the Pacific Ocean presents unusual opportunities and facilities for study in this field. Universitywide review during the current year will assess the campus potential in marine sciences. Undergraduate programs will continue to be diversified and strengthened, particularly through new approaches to learning and evaluation as well as continued reallocation of resources.

Graduate development at Santa Barbara will be based upon existing programs in ways that are conscious of growing and important needs of society, of developments in academic disciplines, and of student needs. Only programs which arise out of existing campus disciplines or are developed jointly with another campus are contemplated within the next several years, with the possible exception of a Law School. Those programs, if added, would be justified in terms of overall need in the University.

Program Review

The campus has undertaken to review all of its graduate programs to assess relative strengths and weaknesses. Part of the review process involves use of experts from other University of California campuses and from other universities. Over the past two years, the following programs have been analyzed: History, Biological Sciences, Mathematics, and Political Science. Nine departments are scheduled for review in 1973-74. The accelerated pace of review will be continued to insure that all programs are reviewed by the end of the 1974-75 academic year.

UNIVERSITY OF CALIFORNIA - SANTA CRUZ

State of Development--Size and Scope

In Fall 1973, the Santa Cruz campus enrolled 5,082 students (4,785 undergraduates and 297 graduates).

A large proportion of undergraduates at Santa Cruz major in letters; other fields popular with undergraduates are social sciences, biological sciences, psychology,

and interdisciplinary studies. At the graduate level physical sciences, letters, interdisciplinary studies, and biological sciences account for the largest proportions of the small graduate enrollment.

The colleges at Santa Cruz are small, with an emphasis upon close relationships between students and faculty in the residential setting of the colleges. The Divisions (Humanities, Sciences, and Social Sciences) are groupings of the disciplines, each discipline with a Board of Studies (roughly comparable to an academic department). Faculty members hold appointment partly in a college and partly in a Division.

The first six colleges have reached full size. College Seven is not yet fully developed. College Eight has just enrolled its first students.

Enrollment in 1977-78 is presently estimated at 6,600. The planning figure for enrollment in the beginning of the 1980s is 7,500. Accordingly, it is expected that not more than ten colleges will be required to see the campus through the decade of the 1970s.

Academic Thrust

Much of the educational, intellectual and social life of the Santa Cruz campus goes on within the colleges and many of the classrooms are located there. Each college has developed a distinctive academic emphasis or characteristic educational atmosphere, although every college includes faculty representing all the major academic disciplines and students with a wide variety of interests. The interdisciplinary collaboration of faculty within the colleges facilitates experimentation and innovative programs. The student's college supervises his academic progress toward the bachelor's degree and recommends award of the degree upon completion of his program, which culminates in either a comprehensive examination or a senior thesis.

Some unusual features of the academic program at Santa Cruz are the use of qualitative evaluation of student performance rather than letter grades (with some exceptions at the request of the student), the encouragement of individual work at the student's initiative, and, in several programs, the provision of opportunity for field experience under academic auspices.

Academic programs leading to majors in traditional disciplines, or combinations of disciplines, are administered for the most part by the three divisions; however, some colleges have taken the lead in designing innovative major programs leading to the baccalaureate. Prime responsibilities for curricula and for setting requirements for degrees rest with Boards of Studies, which have some of the functions of the departments found in most universities, or with colleges which function as a Board of Study by virtue of offering a degree program.

The dual system of organization into Colleges and Boards of Studies provides some extraordinary opportunities. Students living in the colleges have easy access to faculty, most of whom have their offices in the colleges. College courses provide an opportunity for faculty and students to work closely together in some highly innovative educational endeavors. Because campus-wide courses and curricula are also available, the college courses need not be shaped by restrictive curricular requirements. Many are cooperative efforts by faculty from different academic disciplines. For the faculty member, his college fellowship provides an opportunity for social and intellectual interaction much broader than that usually derived from the traditional departmental structure.

Santa Cruz has developed one professional program--teacher education. The campus has a unique resource in the famed Lick Observatory. This has made possible the development of a program of unusual distinction in astronomy and astrophysics.

For its first few years the academic emphasis at the campus was almost exclusively on undergraduate studies. Even so, graduate studies have not grown as rapidly as was earlier anticipated for several reasons. First, the campus has not sought to establish many of the traditional graduate programs because it has judged that the greatest need in graduate work is for programs which will be complementary to, rather than duplicative of, successful programs on the older campuses of the University of California. Second, work is still going forward to perfect effective ways for involving graduate students in the collegiate system. Finally, in some areas with the greatest demand for graduate work, resource limitations have necessitated restriction of graduate enrollment.

The collegiate system has proved viable and will continue to be developed. In the growth that will occur during the next eight years, emphasis will be placed on diversification. The additional colleges, through College Ten, will introduce new themes and perhaps some new styles of operation. The proportion of graduate students will increase. However, in view of the heavy commitment of the campus to excellence in undergraduate teaching, graduate and professional enrollments probably will not exceed 10 percent of the student body. Growth of graduate education and research will reflect the desire to establish unique programs, significantly different from those found on other campuses of the University. These may include: graduate studies in social sciences which do not adhere closely to the usual models of doctoral programs, research in which the growing role of information sciences is used to develop new approaches to the problems of social and natural sciences, and a program for interdisciplinary study of the central California coastlands and the inshore marine life and structural complex. The existence of both college and campus-wide courses offers an unparalleled opportunity for graduate students to observe and participate in practice teaching in widely varied situations. In addition, there is a vigorous program of interaction with elementary and secondary schools in Santa Cruz and nearby communities, reaching as far as Watsonville and Salinas.

As growth permits, there will be expanded programs of research and instruction in fields in which Santa Cruz and its environment afford special opportunities. The existing Divisional Laboratory for Marine Studies provides one base for possible further development. Another promising area for development is a professionally oriented program in the field of landscape design and regional planning.

Ph.D. programs presently being offered are:

Astronomy
Biology
Chemistry
Geology
History
History of Consciousness
Information and Computer Science
Literature
Mathematics
Physics
Psychology

Program Review

During the 1973-74 academic year a broad study of health care education will be conducted to ascertain whether a campus like Santa Cruz can enter the field in a

meaningful way without having schools of human or veterinary medicine. The campus will review several other aspects of its programs as it moves forward to define and establish priorities for development as growth makes further development possible.

THE ATOMIC ENERGY COMMISSION LABORATORIES

The Lawrence Berkeley Laboratory conducts basic scientific investigations at or near the frontiers of various physical and biological sciences. Many of its staff are also faculty members of the Berkeley campus, and many scientists from other campuses regularly use LBL research facilities. The Laboratory is engaged in the training of postdoctoral scientists and graduate students from several campuses. LBL is supported primarily by the U.S. Atomic Energy Commission but also receives funds from other federal agencies for energy and environmental work, for cancer research, for cosmic ray and space medicine studies, and materials research.

The main program efforts are in high-energy (particle) physics and nuclear chemistry -- research activities that center about the Laboratory's four principal accelerators: the Bevatron, the SuperHILAC, the 184-inch Synchrocyclotron, and the 88-inch Cyclotron. Other basic research programs include studies of inorganic materials, biology and medicine, chemical biodynamics (for example, photosynthesis and carcinogenesis), controlled thermonuclear reactions, and energy and environmental problems.

An extensive computer facility presently serves the research computational needs of some of the federally supported research activities of various campus departments and institutions.

In the next few years, the Laboratory plans to redirect some of its research efforts. (1) Energy, environment, and materials programs are expected to expand, and will include work on solar energy, geothermal energy, the detection and analysis of pollutants as well as their carcinogenic effects, the design of catalysts, and the hydrogenation of coal. These programs will involve close collaboration with the College of Engineering, College of Chemistry, and other colleges on the Berkeley campus in order to pool diverse talents and expertise. (2) Under the Bevalac project, a beam line is now being constructed to connect the SuperHILAC with the Bevatron, which will enable an unlimited range of heavy particles to be accelerated to high energy. These unique heavy ion beams have practical applications in biology and medicine as well as in astrophysics, nuclear chemistry, and nuclear and particle physics. (3) Laboratory scientists are increasingly becoming involved in experiments at other universities and laboratories having major accelerators. In collaboration with the Stanford Linear Accelerator Center, plans are now being developed for an important new type of high-energy physics facility consisting of two intersecting storage rings (one for protons and the other for electrons and positrons), which can be built in stages.

At present, LBL has about 350 UC graduate students participating in its research programs. These students come from practically all the physical and life science departments and programs on the Berkeley campus. In addition to graduate students, LBL also has undergraduates, usually at the junior and senior level, participating in research programs directed by senior staff and faculty members. This is particularly true for the Chemical Biodynamics and Donner Laboratories, the two LBL laboratories located physically on the main Berkeley campus.

It has been LBL's policy to provide stipends for all graduate students who are doing research for an advanced degree with a senior member of the LBL staff, even though in recent years the Laboratory's budget has been declining.

LBL believes that a steady flux of students is highly desirable and therefore plans to encourage more use of LBL facilities by non-local groups and to initiate programs in new areas of research. Such programs, however, are dependent upon future trends of graduate student enrollment in various departments. In some disciplines, notably physics, the number of graduate students enrolling on the Berkeley Campus has been declining in recent years. In the metallurgy-ceramics, chemistry, and biological fields, however, graduate enrollment remains at a high level.

In recent years, LBL-supported graduate students have earned approximately 85 Ph.D. degrees and 25 M.S. degrees each year, a significant fraction of the total degrees awarded by the physical and life science departments on the Berkeley Campus.

The Lawrence Livermore Laboratory, located on Federal property three miles east of the City of Livermore, is primarily concerned with the application of current scientific knowledge and advanced engineering technology to the solution of problems of national interest. The major programs currently being pursued are: research and development of nuclear explosives for weapons applications; investigations of industrial applications of nuclear explosives; research on controlled fusion reactions for the generation of relatively pollution-free electric power; development of high-power, short-pulse laser systems and exploration of their use in initiating controlled fusion reactions and other applications; bio-medical research into the biological effects of the release of pollutants into the biosphere; basic scientific research and technological development related to the major program objectives; and a recently initiated program of environmental research including a study of long-range effects of high-altitude contamination such as that produced by SST aircraft.

The educational activities at the Lawrence Livermore Laboratory are characterized by two distinct objectives: maintaining and improving the scientific and technical competence of the staff, and utilizing the extensive facilities and highly trained staff of the Laboratory in the graduate education program of the University.

The Department of Applied Science (DAS) of the College of Engineering at Davis is the strongest link between the Laboratory and the academic community. A section of DAS is housed in classroom buildings located adjacent to the Laboratory. The Department of Applied Science is concerned with graduate study, with the master's degree program providing a broad background in physical science and mathematics. Ph.D. work concentrates in areas where the Lawrence Livermore Laboratory is strong in scientific and engineering staff and in applicable facilities.

Currently 83 students are registered at the Livermore branch of the Department of Applied Science. Of these, 25 are at present full-time Laboratory employees of whom 20 are Ph.D. candidates and 5 are M.S. candidates. The first master's degrees were granted in August 1964, and the total granted to date is 109. The first doctor's degrees were granted in August 1966, and the total granted to date is 55. Only 9 of the doctor's degrees were granted to Laboratory employees. The Ph.D. thesis projects of the DAS make use of the extensive facilities of the Laboratory with departmental guidance and supervision. Other departments at Davis and some on the Berkeley campus have also made use of the Laboratory's facilities for thesis research.

Since each thesis project must not only meet the requirements of the student's academic department but must also fit into the program objectives of the Laboratory, no firm projection of the number of graduate students engaged in Ph.D. thesis research can be made. However, a growth in the number to about 100 over the next five years would seem to be likely.

The Davis-Livermore Microwave TV Link completed in 1972 is an extension of the Laboratory's continuing education facility that now provides two-way communication between the Davis campus and Livermore. This installation constitutes an experiment in an educational technique that may well be useful to the University as a whole as a model for tying each campus to its surrounding communities and for providing fully interactive communication between the campuses. The Departments of Mechanical Engineering, Electrical Engineering, Civil Engineering and Applied Science of the Davis campus use the television link to transmit a variety of courses to the Livermore area. (Also, in a collaborative program with Stanford University, 40 to 55 lecture hours per week originating at Stanford are received through the Lawrence Livermore Laboratory Institutional TV system and viewed in a classroom at the Laboratory and also at Sandia in New Mexico.)

The Los Alamos Scientific Laboratory, founded in 1943, is located in northern New Mexico. During the 1950s, the Laboratory was gradually moved from the townsite to an adjacent mesa and temporary wartime buildings were replaced by modern permanent structures. During this period, interests of the Laboratory expanded from research on nuclear explosives to include studies in peaceful aspects of the use of atomic energy, in such areas as thermonuclear power, nuclear propulsion of rockets for space application, plutonium fuels, high temperature gas-cooled reactor systems, and effects of nuclear radiation at molecular and cellular levels. Other major research programs at LASL presently include medium energy physics (Clinton P. Anderson Meson Physics Facility) and nuclear safeguards. In addition, many projects are now funded by government agencies other than the AEC. In recent years, the non-weapons programs accounted for approximately 30% of the total Laboratory effort, with the remaining 70% being supported by the AEC Division of Military Applications.

In further expansion of the Laboratory's efforts to assure the widest possible contact with, and stimulation of its staff by, university academic personnel, a program of cooperation with universities of the region was initiated in 1963 and expanded and placed on a formal basis in 1964.

There are a large number of programs at LASL designed to provide educational and training opportunities, both for its own personnel and for some outside individuals, and to ensure a high degree of cooperation and scientific exchange with outside institutions. The vigor of the Laboratory is also maintained through professional exchanges at many significant scientific and engineering meetings held at the Laboratory each year and through the use of outside review committees for several of the Laboratory's programs. Because of its location, LASL has found that the University of California is but one participant among many in the following educational programs:

The Summer Graduate Student Program provides graduate students with summer jobs that contribute to their professional education and helps them continue their graduate studies. A particular effort is made to attract applications from qualified candidates who are women or are from minority groups. Each summer since 1950 the Technical Divisions of the Laboratory have employed an average of 85 science and engineering graduate students from 40 to 50 different universities.

The Undergraduate Cooperative Program provides an opportunity for undergraduate students at several New Mexico universities to alternate six-month periods of study on campus with six-month "work phases" at LASL. Currently 29 students are involved.

LASL is cooperating with Associated Western Universities, Inc. (AWU), and the Northwestern College and University Association for Science (NORCUS) to provide research experience at LASL. Ten professors and four graduate students received appointments from these associations for work at the Laboratory in the summer of 1973.

In addition to its program of summer research appointments, AWU has a Graduate Fellowship Program which provides year-round support for graduate students to perform research for M.S. or Ph.D. degrees at AEC facilities or industrial laboratories. There are a dozen graduate students participating in this program at LASL this year.

With the forthcoming full operation of the Clinton P. Anderson Meson Physics Facility, there has been formed the CPAMPF Users Group. The CPAMPF is a national facility, and use of the accelerator beams will be granted to experimenters on the basis of an evaluation of the scientific merit of the proposed research and of the qualifications of the experimenters. There are presently about 1,000 members of the Users Group from the U.S. and 11 foreign countries, representing (in addition to LASL) more than 200 institutions such as universities, hospitals and medical centers, industry, and government.

Appendix 1

UNIVERSITY OF CALIFORNIA DEGREE PROGRAM INVENTORY

The following inventory lists all the degree programs currently approved on the various campuses of the University of California. The classification scheme used in the inventory is that of the Higher Education General Information System. The campus lists of degree programs in the section, "Campus Profiles," differ from the inventory in that they use campus nomenclature and are arranged alphabetically.

The University intends to make greater use of inventories of existing programs than it has done previously. In order to provide maximum information to potential students, for example, each general catalog should include in tabular form a listing of the degrees offered by the campus for the academic year covered by the catalog. This listing should show, by School or College and department, the title of each degree offered, including specialty degrees within a department.

It should be noted that the inventory says nothing about program size. Furthermore, degree programs with similar titles may offer different emphases, and a given program leading to a single degree may incorporate much flexibility within its curriculum. One campus may, for instance, for reasons of tradition or organization (about which the listing of degree offerings is silent), list a single degree offering in engineering with a number of specializations as options, while another campus that offers essentially the same specializations may list several individually identified degrees within engineering. In recent years the growth of interdisciplinary programs has accentuated the need for careful use of degree titles in considering similarly named programs. "Ecological studies," for instance, may be based in the biological sciences, social sciences, may have a technological orientation, or may combine these approaches.

UNIVERSITY OF CALIFORNIA DEGREE PROGRAM INVENTORY
September 1, 1973

SYMBOLS: BA, BS, MA, PhD, etc. = Degree Designations
C = Certificate Program
† = Candidate in Philosophy is available

b, m or d = Concentration within another bachelor's, master's or doctor's degree program respectively. (Not all concentrations are listed. Campus catalogs should be consulted additionally.)

PROGRAM CATEGORIES (HEGIS)	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0100 AGRICULTURE AND NATURAL RESOURCES									
0102 Agronomy (Field crops and crop management)		MS			b/m				
0103 Soils Science (Management and conservation)	MS/PhD	MS/PhD			BA/BS MS/PhD				
0104 Animal Science (Husbandry)		BS/MS							
0106 Avian Science		BS/MS							
0107 Fish, Game and Wildlife Management		BS							
0108 Horticulture (Fruit and vegetable production)		MS			b/m				
0109 Ornamental Horticulture (Floriculture, nursery science)					b/m				
0110 Agricultural Science and Management		BS							
0111 Agricultural Economics	BS/PhD	MS/PhD							
0112 Agricultural Business		BS							
0113 Food Science and Technology	BS/MS	BS/MS							
0114 Forestry	BS/MS/MF								
0115 Natural Resources Management	BS	BS							
0116 Agriculture and Forestry Technologies (Baccalaureate and higher programs)	BS								
0117 Range Management	MS	BS/MS							

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0100 AGRICULTURE AND NATURAL RESOURCES - Cont'd.									
0199 Other:									
Agricultural Chemistry	PhD	MS/PhD							
Agricultural Economics and Business Management		BS							
Crop Protection		BS							
Fermentation Science		BS							
Genetics	BS								
"Individual Majors' Program" (In College of Agricultural Science and Management)		BS							
International Agricultural Development		BS/MS							
Irrigation		MS							
Pest Management	BS								
Plant Physiology	MS/PhD†								
Range Science		BS							
Renewable Natural Science		BS							
Soil and Plant Nutrition	BS								
Soil and Water Science		BS							
Vegetable Crops		MS							
Wildland Resource Science	PhD								
Wood Science and Technology	BS/MS/PhD								
0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN									
0202 Architecture	BA/BArch/ MArch/PhD†			MArch					
0204 Landscape Architecture	BA/BLA/MLA								
0206 City, Community and Regional Planning	MCP/PhD†								
0299 Other:									
Architecture and Urban Planning				MA					
Design		BS							
Environmental Planning	PhD								
Environmental Planning and Management		BS							
Urban Planning				PhD					

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0300 AREA STUDIES									
0301 Asian Studies, general	MA/PhD		b		BA			BA/MA	
0302 East Asian Studies	m	BA		BA					
0304 Southeast Asian Studies	MA/PhD 1/ 1/								
0305 African Studies		BA	b	MA				BA	
0306 Islamic Studies				MA/PhD†					
0307 Russian and Slavic Studies					BA			BA	
0308 Latin American Studies	PhD		b	BA/MA	BA				BA
0309 Middle Eastern Studies								BA	
0313 American Studies		BA	b		BA				
0399 Other:									
Ancient Near Eastern Civilization				BA					
Buddhist Studies	PhD								
Chinese Studies						BA			
Comparative Culture (See Social Sciences)			BA/PhD						
Hispanic Civilization								BA	
Indian Civilization (Asiatic)	BA								
Indo-European				BA/PhD†					
Near Eastern Studies	BA/MA/PhD†			BA					
Russian Literature & History (0307)		BA							
Russian/Soviet Area Studies					BA				
Western Civilization									BA
0400 BIOLOGICAL SCIENCES									
0401 Biology, general	BA	BA/BS	b*/MAT	BA/MA/PhD	BA/BS/ MA/PhD	BA/PhD		BA/MA/PhD	BA/MA/PhD†
0402 Botany, general	BA/MA/PhD†	BA/BS MS/PhD +/		b/m	b/PhD			BA/MA	
0403 Bacteriology	BA/MA/PhD†	BA/BS		BA					
0404 Plant Pathology	MS/PhD†	BS/MS/PhD			MS/PhD				

1/ Southeast Asian Languages and Literatures
+/ Includes joint program with Chico State University

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0400 BIOLOGICAL SCIENCES - Cont'd.									
0406 Plant Physiology	MS/PhD†	MS/PhD			PhD				
0407 Zoology, general	BA/MA/PhD†	BA/BS MA/PhD		b/m	b			BA/MA	
0408 Pathology, human and animal		m/d					MS/PhD		
0409 Pharmacology, human and animal		m**/d**	m**/d**	MS/PhD		d	MS/PhD		
0410 Physiology, human and animal	BA/MA/PhD	BS/MS/PhD		MS/PhD	b	d	MA/PhD		
0411 Microbiology	MA/PhD	BA/BS/ MA/PhD		MA/PhD	b		MA/PhD		
0412 Anatomy	MA/PhD	MS/PhD		MS/PhD			MA/PhD		
0414 Biochemistry	BA/MA/PhD†	BS/MA/PhD		BS/MS/PhD†	BA/BS/ MA/PhD		MS/PhD	b	
0415 Biophysics	b/PhD	PhD					PhD		
0416 Molecular Biology	MA/PhD			PhD	b			b	
0417 Cell Biology (Cytology, cell physiology)	b	BS			b			BA	
0418 Marine Biology	b					MS/PhD			
0419 Biostatistics	MA/PhD			MS/PhD					
0420 Ecology	b	MS/PhD			b/PhD 2/				
0421 Entomology	BS/MS/PhD	BS/MS/PhD			BA/BS/ MS/PhD				
0422 Genetics	BA/MS/PhD† ¾/	BS/MS/PhD			PhD				
0424 Nutrition, Scientific (Excludes nutrition in Home Economics and Dietetics)	BS/MS/PhD†	BA/BS/ MS/PhD					MS/PhD		
0425 Neurosciences	BS			PhD		MS/PhD			
0426 Toxicology		m**/d**	m**/d**				m***/d***		

2/ Joint program with San Diego State University
¾/ Including joint Ph.D. program with San Diego State University

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0400 BIOLOGICAL SCIENCES - Cont'd.									
0499 Other:									
Aquatic Biology								BA	
Biological Chemistry				MS/PhD					
*Biological Sciences:			BS/MA/PhD					BA	
Developmental and Cell Biology			b/m/d						
Molecular Biology and Biochemistry			b/m/d					BA	
Population and Environmental Biology			b/m/d						
Psychobiology			b/m/d		BS				
Biomathematics				MS/PhD					
Bioradiology	MBiorad								
Comparative Biochemistry	MA/PhD								
***Comparative Pharmacology and Toxicology							MS/PhD		
Endocrinology	MA/PhD†	MA/PhD					MA/PhD		
Environmental Biology								BA	
Environmental Science					BS				
Health Sciences						BA			
Immunology	MA/PhD†						PhD[3/]		
Medical Physics (See also Health Sciences and Physical Sciences)	PhD			MS/PhD			PhD		
Microbiology and Immunology				MS/PhD					
Paleobiology - Joint double major/Physical Sciences					BS				
Parasitology	MS/PhD								
**Pharmacology and Toxicology		MS/PhD	MS/PhD						
Physiology and Pharmacology						PhD			
Plant Science					BS/MS				
Population Biology					PhD				
Wildlife and Fisheries Biology		BS							
0500 BUSINESS AND MANAGEMENT									
0506 Business Management and Administration	BS/MBA/MS/PhD		MS/PhD	MBA/MS/PhD†	MAdmin/MA/PhD				
0507 Operations Research	m								
0517 Business Economics				BA				BA	

3/ Joint program with Berkeley

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0600 COMMUNICATIONS									
0601 Communications, general				BA		BA		BA	
0602 Journalism (Printed media)	BA/MJ			¥/ ¥/ MA/MJ					
0699 Other:									
Communications and Public Policy	BA								
0700 COMPUTER AND INFORMATION SCIENCES									
0701 Computer and Information Sciences, general	BA/BS/MA/MS/ PhD†/DEngrg		BS/PhD	MS/PhD		MS/PhD		BA	BS/MS/PhD
0799 Other:									
Applied Physics and Information Science						BA			
Medical Information Science							MS/PhD		
0800 EDUCATION									
0801 Education, general	MA/MEd/ PhD†/EdD			MA/MEd/ PhD/EdD	MA/PhD/EdD			C/MA/ MEd/PhD	
0802 Elementary Education, general	C	C	C 4/	C	C			C/m	MA 6/
0803 Secondary Education, general	C	C	C 4/	C	C			C	
0806 Junior and Community College Education								C	
0808 Special Education, general	PhD/EdD 5a/			PhD 5b/					
0810 Education of the Mentally Retarded					C				

4/ Fifth year credential program only
5a/ Joint programs with San Francisco State University
5b/ Joint program with Cal State University - LA
6/ Available only to restricted group - 1971-74
¥/ Programs suspended through June, 1974

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0800 EDUCATION - Cont'd.									
0821 Social Foundations (History and philosophy of education)				m/d					
0822 Educational Psychology (Include learning theory)	C			m/d				m	
0826 Student Personnel (Counseling and guidance)				C/m/d				C/MEd	
0827 Educational Administration				C/d	C/m				
0829 Curriculum and Instruction				m/d					
0830 Reading Education(Methodology and theory)								m	
0832 Music Education (Methodology and theory)		MAT							
0833 Mathematics Education (Methodology and theory)		MAT		b/MAT				m	
0834 Science/Mathematics Education (Methodology and theory)	PhD								
0835 Physical Education	BA/MA	BA/MA		BS/MS 7/ 7/				BA/MA	
0837 Health Education (Include family life education)				m/d					
0838 Business, Commerce and Distributive Education				m/d					
0899 Other:									
Agricultural Education		BA/MEd							
Biology Education			MAT						
Comparative Literature Education		BA							
Comparative Literature Education (Teaching)	MAT								
Confluent								m	
Early Childhood								m	
English Education (Teaching)	MAT								

7/ Kinesiology

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0800 EDUCATION - Cont'd.									
0899 Other - Cont'd.:									
German Education (Teaching)	MAT								
Health Studies (Ergonomics)								BA	
Human Factors (Ergonomics)								BA	
Music (Teaching)		MAT							
Physics Education				MAT					
School Psychology								C	
School Psychometrist								C	
Standard Supervision								C	
Training in Librarianship	C								
0900 ENGINEERING									
0901 Engineering, general			BS/MS/PhD	BS/MS/ MEngr/PhD					
0902 Aerospace, Aeronautical and Astronautical Engineering	BS/MS/MEngr/ PhD/DEngr	BS				m/d			
0903 Agricultural Engineering		BS/MS/MEngr/ PhD/DEngr							
0905 Bioengineering and Biomedical Engineering	b/m/d	PhD		b/m/d		m/d			
0906 Chemical Engineering (Include petroleum refining)	BS/MS/PhD	BS/MS/MEngr/ PhD/DEngr		b/m/d				BS/MS/PhD	
0908 Civil, Construction and Transportation Engineering	BS/MS/MEngr/ PhD/DEngr	BS/MS/MEngr/ PhD/DEngr	b/m/d	b/m/d					
0909 Electrical, Electronics and Communications Engineering	BS/MS/MEngr/ PhD†/DEngr	BS/MS/MEngr/ PhD/DEngr	b/m/d	b/m/d				BS/MS/PhD	
0910 Mechanical Engineering	BS/MS/MEngr/ PhD/DEngr	BS/MS/MEngr/ PhD/DEngr	b/m/d	b/m/d				BS/MS/PhD	
0911 Geological Engineering	m/d								
0913 Industrial and Management Engineering	BS/MS/MEngr/ PhD/DEngr			b/m/d					
0914 Metallurgical Engineering	m/d			b/m/d					
0915 Materials Science and Engineering	BS/MS/MEngr/ PhD/DEngr	BS		b/m/d					

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
0900 ENGINEERING - Cont'd.									
0916 Ceramic Engineering	m/d			b/m/d					
0919 Engineering Physics	b					m/d			
0920 Nuclear Engineering	MS/MEngr/ PhD/DEngr			b/m/d				BS	
0921 Engineering Mechanics				b/m/d					
0922 Environmental and Sanitary Engineering	MS/MEngr/ PhD/DEngr		b/m/d						
0923 Naval Architecture and Marine Engineering	MS/MEngr/ PhD/DEngr								
0924 Ocean Engineering	m/d								
0999 Other:									
Applied Mechanics and Engineering Sciences						BA/m/d			
Applied Physics						MS/PhD			
Applied Science		MS/PhD							
Double Majors	BS								
Engineering and Applied Science				C					
Engineering Sciences:	BS/MS/PhD					MS/PhD			
Engineering Geoscience	b								
Engineering Mathematics or Mathematical Statistics	b								
Individual Study		BS							
1000 FINE AND APPLIED ARTS									
1001 Fine Arts, general		BA	MFA					BA/m	
1002 Art (Painting, drawing, sculpture)	BA/MA	BA/MFA	BA/m	BA/MA/MFA	BA			BA/MFA/d	BA
1003 Art History and Appreciation	BA/MA/PhD	BA/MA	BA	BA/PhD	BA/MA			BA/MA/PhD†	
1004 Music (Performing, composition, theory)	b/m/d		b/m	MFA	b/m			BA/BM/MA	
1005 Music (Liberal Arts program)	BA/MA/PhD	BA/MA	BA/m	BA/MA/PhD†	BA/MA	BA/MA/PhD		BA/MA/PhD	BA
1006 Music History and Appreciation (Musicology)	b/m/d	m	b/m	b/m/d	BA/m				

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1000 FINE AND APPLIED ARTS - Cont'd.									
1007 Dramatic Arts	BA/MA/PhD	BA/MA/ MFA/PhD	BA/m	BA/MA/ MFA/PhD				BA/MA/PhD	BA
1008 Dance	b		BA/m	BA/MA	BA			BA	
1009 Applied Design (Ceramics, weaving, textile design, fashion design, jewelry, metalsmithing, interior decoration, commercial art)	BA/MA			BA					
1099 Other:									
Aestnetic Studies									BA
Arts and Crafts and Their History									BA
Art Painting								BA/m	
Art Printmaking								BA/m	
Art Sculpture								BA/m	
Ceramics								BA/m	
Dramatic Arts - Speech								BA	
Ethnic Arts				BA					
Film Studies (Experimental)								BA	
Fine Arts Interdisciplinary					BA				
Mass Media								BA	
Studio Art					BA				
Theatre (Drama)					BA/MA/MFA				
Visual Arts						BA/MFA			
1100 FOREIGN LANGUAGES									
1102 French	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD†	BA/MA/PhD			BA/MA/PhD	
1103 German	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD	BA/MA	BA/MA/PhD				
1104 Italian	BA/MA/PhD	BA		BA/MA/PhD†				BA	
1105 Spanish	BA/MA	BA/MA/PhD	BA/MA/PhD	BA/MA	BA/MA/PhD			BA/MA/PhD†	
1106 Russian	b/m/d	BA/MA	BA		BA				
1107 Chinese	b/m/d			BA					
1108 Japanese	b/m/d			BA					

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1100 FOREIGN LANGUAGES - Cont'd.									
1109 Latin	BA/MA	BA	b	BA/MA	BA			BA	
1110 Greek, Classical	BA/MA	BA	b	BA/MA	BA			BA	
1111 Hebrew	b/m/d			BA					
1112 Arabic	b/m/d			BA					
1113 Indian (Asiatic)	b/m/d								
1114 Scandinavian Languages				BA/MA					
1115 Slavic Languages and Literatures (Other than Russian)								BA	
1116 African Languages (Non-Semitic)				BA					
1199 Other:									
French and Linguistics				BA					
Germanic Languages				PhD				BA/MA/PhD 8/	
Hispanic Languages and Literatures				PhD†					
Italian and Special Fields				BA					
Luso Brazilian Languages and Literatures				MA					
Near Eastern Languages and Literatures				MA/PhD†					
Oriental Languages	MA/PhD†	BA		MA/PhD†					
Portuguese				BA				BA	
Scandinavian Languages and Literatures	BA/MA/PhD								
Slavic Languages and Literatures (Including Russian requirement)	BA/MA/PhD†			BA/MA/PhD					
South and Southeast Asian Languages and Literatures	MA/PhD								
Translating and Interpreting in German and English								C	
1200 HEALTH PROFESSIONS									
1201 Health Professions, general							BS 9/		
1202 Hospital and Health Care Administration	m						MPH		

8/ and Literatures
9/ Limited Internships and residencies only.(Preprofessional and professional curricula not available)

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1200 HEALTH PROFESSIONS - Cont'd.									
1203 Nursing (Baccalaureate and higher programs)				BS/MN			10/ 10/ BS/MS/DNS		
1204 Dental Surgery				DDS			DDS		
1205 Dental Specialties (Work beyond first professional degree, D.D.S. or D.M.D.)				C			C		
1206 Medicine, M.D. degree		MD	MD	MD		MD	MD		
1207 Medical Specialties (Work beyond first professional degree, M.D.)				C					
1209 Optometry	DOpt								
1211 Pharmacy							PharmD		
1212 Physical Therapy							BS/C		
1213 Dental Hygiene (Baccalaureate and higher programs)							BS		
1214 Public Health	MPH/DrPH			BS/MS/ MPH/DrPH			MPH/DrPH		
1218 Veterinary Medicine (D.V.M. degree)		DVM							
1222 Clinical Social Work (Medical and psychiatric and specialized rehabilitation services)				MSP					
1225 Radiological Sciences (Baccalaureate and higher programs)			MS/PhD						
1299 Other:									
Adult Psychiatric Nursing							C		
Biological and Medical Uses of Radioisotopes							C		
Clinical Laboratory Science							MCLS		
Community Health Nursing							C		
Community Mental Health Nursing							C		
Comparative Pathology	MS/PhD	MS/PhD					MS/PhD		
Comparative Pharmacology and Toxicology							MS/PhD		

10/ And Nursing Science

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1200 HEALTH PROFESSIONS - Cont'd.									
1299 Other - Cont'd.:									
Comprehensive Health Planning				MS					
Endocrinology and Metabolism							C		
Environmental Health Sciences	MS/PhD								
Epidemiology	m/PhD								
Exfoliative Cytology							C		
Experimental Pathology						PhD			
Family Nurse Practice		MHS							
Integrative Nursing							C		
Internship and Residency in Hospital Pharmacy							C		
Internship in Hospital Administration							C		
Internship in Hospital Dietetics							C		
Maternal-Child Nursing							C		
Medical Illustration							C		
Medical Internship							C		
Medical Physics (See also Biological Sciences and Physical Sciences)	PhD			MS/PhD					
Medical-Surgical Nursing							C		
Medical Technology							C		
Nursing Service Administration							C		
Orthoptic Technique							C		
Physiological Optics	BS/MS/PhD								
Postdoctoral Program in Periodontology							C		
Preventive Medicine and Public Health				MS					
Preventive Veterinary Medicine		MPVM							
Psychiatric Nursing of Children and the Mentally Retarded							C		
Research Training in Social Psychiatry							C		
Residencies in Various Medical and Surgical Specialties							C		
School of Nursing Administration							C		
Speech and Hearing Sciences							PhD 11/	PhD 11/	
Training in Radiologic Technology							C		

11/ Joint intercampus program between UCSF and UCSB

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1300 HOME ECONOMICS									
1301 Home Economics, general		BS						BA	
1303 Clothing and Textiles								BA	
1304 Consumer Economics and Home Management		BS						BA	
1305 Family Relations and Child Development		BS/MS						BA	
1306 Foods and Nutrition (Include Dietetics)	BS	BS						BA	
1307 Food Service Management		BS							
1399 Other:									
Community Nutrition		BS							
Consumer Science		MS							
1400 LAW									
1401 Law, general	LLM/JD/JSD	LLM/JD/JSD		13/ 14/ MCL/LLM/JD					
1499 Other:									
Law/Economics	JD/MA 12/								
Law and Society	MA							BA	
1500 LETTERS									
1501 English, general	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD†	BA/MA/PhD			BA/MA/PhD	
1502 Literature, English					BA/m/d				
1503 Comparative Literature	BA/MA/PhD†	BA	BA/MA/PhD	MA/PhD	BA/MA/PhD	PhD		BA/MA/PhD	

12/ Concurrent degree program
13/ No present formal program; available only to selected foreign students
14/ No formal program at present

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1500 LETTERS - Cont'd.									
1504 Classics	MA/PhD	MA	BA/PhD	BA/MA/PhD†	BA			BA/MA	
1505 Linguistics (Include Phonetics, semantics and philology)	BA/MA/PhD†	BA/MA	BA	BA/MA/PhD†	BA	BA/MA/PhD		BA	BA
1506 Speech, Debate and Forensic Science (Rhetoric and public address)	BA/MA/PhD†	BA/MA		MA 17/				BA/MA	
1507 Creative Writing (English)			b/MFA						
1508 Teaching of English as a second language				b/C/MA					
1509 Philosophy	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD		BA/MA/PhD†	BA
1510 Religious Studies (Exclude theological professions)	BA	BA		BA	BA			BA/MA/PhD	BA
1599 Other:									
Ancient Civilization					BA				
Classic Archaeology	MA/PhD								
Classical Civilization			BA					BA	
English/Greek or Latin - Joint Major				BA					
English/Linguistics - Joint Major		BA							
English Teaching		BA							
Folklore and Mythology	MA 15/			MA					
French Literature						PhD			
German Literature						PhD			
Linguistics/English, French, Italian, Philosophy, Psychology or Oriental Language - Joint Major Options (6)				BA					
Literature						BA			
Literature - English and American						PhD			
Literature (Two or more)									BA/MA/PhD
Near Eastern Religions	PhD 16/								
Romance Languages and Literatures	PhD†								
Romance Linguistics and Literatures				MA/PhD†					
Romance Philology	PhD†								
Spanish Literature						PhD			
Speech and Hearing								BA	

15/ Folklore only
16/ Joint with Berkeley Graduate Theological Union
17/ Program suspended through June, 1974

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1600 LIBRARY SCIENCE									
1601 Library Science, general	C/MLS/ PhD†/DLS			C/MLS					
1699 Other:									
Bibliography; Library Automation and Information Service; Library Management	C								
1700 MATHEMATICS									
1701 Mathematics, general	BA/MA/PhD†	BA/BS/ MA/PhD	BA/MA/PhD	BA/MA/PhD†	BA/BS/ MA/PhD	BA/MA/PhD		BA/MA/PhD	BA/MA/PhD
1702 Statistics, Mathematical and Theoretical	BA/MA/PhD†				BA				
1703 Applied Mathematics	BA/PhD†			m				MA	
1799 Other:									
Applied Statistics					PhD				
Cybernetics				BS					
Mathematics - Applied Science 18/				BA					
Mathematics - Computer Science 18/				BA					
Mathematics - System Science 18/				BA					
Mathematics for Teachers	BA								
1800 MILITARY SCIENCES									
1801 Military Science (Army)	BA								
1802 Naval Science (Navy; Marines)	BA								
1803 Aerospace Science (Air Force)	BA			b					

18/ Joint majors

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
1900 PHYSICAL SCIENCES									
1901 Physical Sciences, general	BA	BA/BS			BS				
1902 Physics, general (Exclude Biophysics)	BA/MA/PhD	BA/BS/ MA/PhD	BA/MA/PhD	BA/BS/ MS/PhD	BA/BS/ MA/PhD	BA/MS/PhD		BA/BS/ MA/PhD	BA/MA/PhD
1905 Chemistry, general (Exclude Biochemistry)	BS/MS/PhD	BA/BS/ MS/PhD	BA/MA/PhD	BS/MS/PhD†	BA/MA/PhD	BA/MS/PhD #/		BA/BS/ MA/PhD	BA/MS/PhD
1910 Pharmaceutical Chemistry							MS/PhD		
1911 Astronomy	BA/MA/PhD†			BA/MA/PhD					MS/PhD
1913 Atmospheric Sciences and Meteorology		BA/BS/ MS/PhD		BA/C/ MS/PhD†					
1914 Geology	BA/MA/ MS/PhD	BA/BS/ MS/PhD		BS/MS/PhD†	BA/BS			BA/MA/PhD	MS/PhD
1915 Geochemistry				MS/PhD					
1916 Geophysics and Seismology	BA/MA/PhD			b	BS				
1917 Earth Sciences, general						BA/MS/PhD			BA/BS
1918 Paleontology	BA/MA/PhD†								
1919 Oceanography						MS/PhD			
1920 Metallurgy	b/m/d								
1999 Other:									
Applied Physics						MS/PhD			
Applied Science					BS				
Basic Chemistry	BS								
Engineering Geology				BS					
Geological Sciences					MA/PhD				
Medical Physics (See also Health Sciences and Biological Sciences)	BA/PhD			MS/PhD					
Paleobiology					BA				
Planetary and Space Physics				MS/PhD					
Planetary and Space Science				BS					
Scientific Instrumentation (Physics)								m	

#/ Including joint Ph.D. program with San Diego State University

	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
2000 PSYCHOLOGY									
2001 Psychology, general	BA/MA/PhD	BA/BS/ MA/PhD	b/PhD	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD	MA/PhD	BA/MA/PhD	BA/MS/PhD
2002 Experimental Psychology (Animal and Human)								BA	
2009 Developmental Psychology								BA	
2010 Physiological Psychology	d							BA	
2099 Other:									
Applied Behavioral Science		BA							
Human Development					BA				
Psychobiology				BA	BA				BA
Quantitative Psychology				BA					
2100 PUBLIC AFFAIRS AND SERVICES									
2101 Community Services, general								m/d	
2102 Public Administration				MPA	m				
2104 Social Work and Helping Services (Other than Clinical Social Work)	BA/MSW/DSW			MSW/DSW					
2199 Other:									
Community Studies									BA
Public Policy	MPP/PhD								
Public Service		b							
Public and Social Affairs								MA	

2200 SOCIAL SCIENCES	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
2201 Social Sciences, general	BA		BA/PhD 19/		BA			BA	
2202 Anthropology	BA/MA/PhD	BA/BS/ MA/PhD	b	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD		BA/MA/PhD†	BA
2203 Archaeology	m/d			MA/PhD					
2204 Economics	¢/ BA/MA/PhD†	BA/MA/PhD	b	BA/MA/PhD†	BA/MA/PhD	BA/PhD		BA/MA/PhD	BA
2205 History	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD	BA/MA/PhD†	BA/MA/PhD	BA/MA/PhD		BA/MA/PhD	BA/MA/PhD
2206 Geography	BA/MA/PhD†	BA/MA/PhD		BA/MA/PhD†	BA/MA/PhD			BA	
2207 Political Science and Government	BA/MA/PhD	BA/MA/PhD	b/PhD	BA/MA/PhD†	BA/MA/PhD			BA/MA/PhD	BA
2208 Sociology	BA/MA/PhD	BA/MA/PhD	b	BA/MA/PhD†	BA/BS/ MA/PhD	BA/PhD	MA/PhD	BA/MA/PhD†	BA
2209 Criminology	BA/MCrim/ DCrim								
2210 International Relations		BA							
2211 Afro-American Studies (Black Culture)	BA	BA	b		BA			BA	
2212 American Indian Cultural Studies	BA								
2213 Mexican-American Cultural Studies	BA		b	BA	BA				
2214 Urban Studies					BA	BA			
2215 Demography	MA/PhD								
2299 Other:									
Analysis and Conservation of Ecological Systems (Geology - Ecosystems)				BA					
Ancient History and Archaeology	MA/PhD								
Comparative Culture			BA/PhD						
Cultural Anthropology								BA	
History of Health Sciences							MA/PhD		
Jewish Studies				BA					
Physical Anthropology								BA	
Social Ecology			BA						
Social Environmental Sciences					BA				
Social Relations					BA/BS				
Third World Studies						BA			
Tutorial								BA	

19/ An MA is available to students admitted to the PhD program who have engaged in prescribed work and have been advanced to candidacy for the PhD.

¢/ See also concurrent degree program with Law

4900 INTERDISCIPLINARY STUDIES	BERKELEY	DAVIS	IRVINE	LOS ANGELES	RIVERSIDE	SAN DIEGO	SAN FRANCISCO	SANTA BARBARA	SANTA CRUZ
4901 General Liberal Arts and Sciences		BA			BA			BA	
4902 Biological and Physical Sciences	BA	BA/BS			BA				BA
4903 Humanities and Social Sciences	BA	BA			BA				
4904 Engineering and other Disciplines	b/m/d	PhD		DEnv. Sci. & Engr.		b/m/d			
4999 Other:									
Administrative Studies					BA				
Agricultural Science, Natural and Social Science Interdisciplinary: Development, Resource and Consumer Economics		BA							
Comparative Studies in Language, Society and Culture						PhD			
DIGS♀- Field Major in Arts	BA								
Environmental Sciences (4902)					BA				
Environmental Studies								BA	BA
History of Consciousness (4903)									PhD
Humanities			BA						
Individual		PhD		BA				BA/MA/PhD	
Logic and the Methodology of Science	PhD†								
Medieval Studies					BA			BA	
Modern Society and Social Thought									BA
Social Ecology			BA						
Social Environmental Studies (4903)					BA				
Systems Ecology					BA				

♀ = Division of Interdisciplinary and General Studies

Appendix 2

LIST OF APPROVED ORGANIZED RESEARCH UNITS IN THE UNIVERSITY OF CALIFORNIA

This list of Approved Organized Research Units (ORUs) in the University of California lists University-wide units on each campus first, followed by campus ORUs arranged by the academic units through whose Deans they report. The dates in parentheses show the year in which the unit's establishment was approved by The Regents.

OFFICE OF THE PRESIDENT

Agricultural Experiment Station (1874), (see also Berkeley, Davis, Riverside)
  Water Resources Center (1957)
Lawrence Berkeley Laboratory (1936), (see also Berkeley)
Lawrence Livermore Laboratory (1952)
Los Alamos Scientific Laboratory (1943)

BERKELEY

UNIVERSITY-WIDE

Agricultural Experiment Station (1874), (see also OP, D, R)
  Forest Products Laboratory (1951)
  Giannini Foundation (1928)
  International Center for Biological Control (1970), (see also R)
  Wildland Research Center (1958)
Bodega Marine Laboratory (1961)
Lawrence Berkeley Laboratory (1936)*
    Inorganic Materials Research Division
    Nuclear Chemistry Division
    Physics Division
  Laboratory of Chemical Biodynamics (1945)
  Donner Laboratory (1941)
Institute of Library Research (1963)
Institute of Transportation and Traffic Engineering (1947)
White Mountain Research Station (1950)

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* Not a Berkeley ORU; listed here for reference only.

BUSINESS ADMINISTRATION

Center for Research in Management Science (1961)

ENGINEERING

Earthquake Engineering Research Center (1967)
Electronics Research Laboratory (1967)
Operations Research Center (1961)
Sanitary Engineering Research Laboratory (1949)
Sea Water Conversion Laboratory (1958)

GRADUATE DIVISION

Institute of Business and Economic Research (1941)
Center for Research and Development in Higher Education (1956)
Institute of Human Development (1927)
Institute of Industrial Relations (1945)
Institute of International Studies (1955)
  Center for Chinese Studies (1957)
  Center for Japanese and Korean Studies (1958)
  Center for Latin American Studies (1958)
  Center for Slavic and East European Studies (1957)
  Center for South and Southeast Asia Studies (1957)
Lawrence Hall of Science (1958)
Institute of Race and Community Relations (1969)
Space Sciences Laboratory (1960)
Survey Research Center (1958)
Institute of Urban and Regional Development (1962)
  Center for Planning and Development Research (1962)
  Center for Real Estate and Urban Economics (1962)

LAW

Earl Warren Legal Institute (1966)
  Center for the Study of Law and Society (1961)

LETTERS AND SCIENCE

Archeological Research Facility (1961)
Field Station for Behavioral Research (1966)
Cancer Research Genetics Laboratory (1950)
Institute of Governmental Studies (1921)
Jepson Herbarium (1949)
Institute of Human Learning (1961)
Lowie Museum of Anthropology (1901)
Museum of Paleontology (1921)

Institute of Personality Assessment and Research (1949)
Center for Pure and Applied Mathematics (1966)
Laboratory of Radio Astronomy (1958)
Seismographic Stations (1887)
Museum of Vertebrate Zoology (1908)
Virus Laboratory (1948)

PUBLIC HEALTH

Naval Biomedical Research Laboratory (1950)

DAVIS

UNIVERSITY-WIDE

Agricultural Experiment Station (1909), (see also OP, B, R)
  Kearney Foundation of Soil Science (1951)

AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Institute of Ecology (1966)
Food Protection and Toxicology Center (1964)

LAW

Center for Administration of Criminal Justice (1967)

LETTERS AND SCIENCE

Agricultural History Center (1965)
Crocker Nuclear Laboratory (1965)
Institute of Governmental Affairs (1962)

VETERINARY MEDICINE

California Primate Research Center (1962)
Radiobiology Laboratory (1965)

IRVINE

Center for Pathobiology (1969)
Public Policy Research Organization (1966)

LOS ANGELES

UNIVERSITY-WIDE

Institute of Geophysics and Planetary Physics (1946),
     (see also R, SD)

CAMPUS-WIDE

Institute of American Cultures (1972)
  Afro-American Studies Center (1969)
  American Indian Studies Center (1971)
  Asian-American Studies Center (1969)
  Chicano Studies Center (1969)
Institute of Industrial Relations (1945)
Molecular Biology Institute (1963)
Laboratory of Nuclear Medicine and Radiation Biology (1947)

DENTISTRY

Dental Research Institute (1966)

FINE ARTS

Institute of Ethnomusicology (1960)

LETTERS AND SCIENCE

Center for African Studies (1958)
Institute for Archeology (1973)
Center for the Study of Comparative Folklore and Mythology (1960)
Institute of Evolutionary and Environmental Biology (1969)
Institute of Government and Public Affairs (1961)
Center for Latin American Studies (1958)
Center for Medieval and Renaissance Studies (1962)
Center for Near Eastern Studies (1957)
Center for Russian and East European Studies (1958)
Survey Research Center (1965)

MANAGEMENT

Western Management Science Institute (1966)

MEDICINE

Brain Research Institute (1959)
Jules Stein Eye Institute (1961)
Institute of Rehabilitation and Chronic Disease (1967)

RIVERSIDE

UNIVERSITY-WIDE

Citrus Research Center and Agricultural Experiment Station

(1907), (see also OP, B, D)
Institute of Geophysics and Planetary Physics (1967),
(see also LA, SD)
International Center for Biological Control (1970),
(see also B)
Statewide Air Pollution Research Center (1961)

CAMPUS-WIDE

Computer Sciences Institute (1961)
Dry Lands Research Institute (1963)
Center for Social and Behavioral Science Research (1970)

SAN DIEGO

UNIVERSITY-WIDE

Institute of Geophysics and Planetary Physics (1946),
(see also LA, R)
Institute of Marine Resources (1954)

CAMPUS-WIDE

Institute for Studies in Developmental Biology (1966)
Center for Human Information Processing (1967)
Center for Research Language Acquisition (1969)
Institute for Pure and Applied Physical Sciences (1967)
Scripps Institution of Oceanography (1912)
Geological Research Division
Marine Biology Research Division
Ocean Research Division
Scientific Support Division
Marine Life Research Group (1947)
Marine Physical Laboratory (1946)
Physiological Research Laboratory (1963)
Visibility Laboratory (1952)

SAN FRANCISCO

CAMPUS-WIDE

Francis I. Proctor Foundation for Research in Ophthalmology
(1947)

MEDICINE

Cancer Research Institute (1948)
Cardiovascular Research Institute (1958)

Hooper Foundation (1913)
Hormone Research Laboratory (1950)
Metabolic Unit for Research in Arthritis and Allied Diseases (1950)
Laboratory of Radiobiology (1949)

SANTA BARBARA

CAMPUS-WIDE

Institute for Interdisciplinary Applications of Algebra and Combinatorics (1973)
Institute for Applied Behavioral Science (1970)
Center for Black Studies (1969)
Channel Islands Field Station (1966)
Center for Chicano Studies (1969)
Community and Organization Research Institute (1967)
Computer Systems Laboratory (1972)
Bureau of Educational Research and Development (1968)
Institute of Environmental Stress (1964)
Marine Science Institute (1969)
Quantum Institute (1969)
Institute of Religious Studies (1966)

SANTA CRUZ

UNIVERSITY-WIDE

Lick Observatory (1888)

CAMPUS-WIDE

Center for South Pacific Studies (1967)